AWADHESH PRATAP SINGH UNIVERSITY

REWA(M.P.)

(ACCREDIATED GRADE "B" BY NAAC)

FACULTY OF SCIENCES

Syllabus for

M.Sc. (PHYSICS)

Choice Based Credit System

With Effect From 2020-21

Examination Scheme

Semester-I

Course code & Name of Paper	Course Type	Theory paper	Internal Assessment	Maximum Marks	Credits
C-1;Classical Mechanics	Core	60	40	100	04
C-2;Quantum Mechanics-I	Core	60	40	100	04
C-3;Electronic Devices	Core	60	40	100	04
*GE-1; Mathematical Physics	Generic Elective	60	40	100	04
CV-1;Comprehensive Viva Voce				100	04
PL-1;Practicals-General				50	02
PL-2;Practicals-Electronics				50	02
Semester Total				600	24

Semester-II

Course code & Name of Paper	Course Type	Theory paper	Internal Assessment	Maximum Marks	Credits
C-4; Quantum Mechanics-II	Core	60	40	100	04
C-5;Statistical Mechanics	Core	60	40	100	04
C-6; Electrodynamics & Plasma Physics	Core	60	40	100	04
*GE-2;Atomic & Molecular Physics	Generic Elective	60	40	100	04
CV-2 ; Comprehensive Viva Voce				100	04
PL-3;Practicals-General				50	02
PL-4;Practicals-Electronics				50	02
Semester Total				600	24

Semester-III

Course code & Name of Paper	Course Type	Theory paper	Internal Assessment	Maximum Marks	Credits
C-7; Nuclear & Particle Physics	Core	60	40	100	04
C-8;Condensed Matter Physics	Core	60	40	100	04
^DCE-1; Digital Electronics or ^DCE-2;Energy Physics or ^DCE-3;Space Technology Or ^DCE-4;Remote Sensing & Applications	Discipline Centric Elective	60	40	100	04
*GE-3; Informatics	Generic Elective	60	40	100	04
CV-3; Comprehensive Viva Voce				100	04
PL-5;Practicals-General				50	02
PL-6;Practicals-Electronics				50	02
Semester Total				600	24

Semester-IV

Course code & Name of Paper	Course Type	Theory paper	Internal Assessment	Maximum Marks	Credits
C-9; Laser Physics	Core	60	40	100	04
C-10;Modern Experimental Techniques	Core	60	40	100	04
^DCE-5; Advance Electronics or ^DCE-6;Astrophysics or ^DCE-7;Environmental Physics Or ^DCE-8;Physics of Nanomaterials	Discipline Centric Elective	60	40	100	04
*GE-4; Atmospheric Science	Generic Elective	60	40	100	04
CV-4; Comprehensive Viva Voce				100	04
PL-7;Practicals-General				50	02
PL-8;Practicals-Electronics				50	02
Semester Total				600	24

*Students may choose this course as Generic Elective or may choose a Generic Elective offered by other UTD departments or may choose a course offered by MOOCs through SWAYAM.

^Students can offer atleast one Discipline Centric Elective Course with internal choice in each course.

M.Sc. Programme

Program Objectives

PO1: Development of Analytical, logical and problem solving skills making use of different Mathematical/Computational tools and Observational skills.

PO2: Provide extensive and intensive knowledge of front line new Technologies/Sciences like Nuclear Technology, Space Technology, Communication Technology, LASER Technology, Nano Technology and Remote sensing Technology alongwith their applications.

PO3: Acquire experimental skills and Observational skills through Laboratory practice.

PO4: Ability to build up Electronic circuits and create Programming skills through laboratory practice.

Po5: Achieving knowledge of certain inter disciplinary subjects correlated to Physics with other associated disciplines.

Program Specific Outcomes

PSO1: Provide knowledge of fundamental Physics to aspiring students.

PSO2: Enhance employability/Entrepreneurship/skill developments

PSO3: To develop skill/ability to perform laboratory experiments/Project works leading to perform research and Entrepreneurial activities.

PSO4: Develop skills of presentation in form of posters and oral presentations in seminars and symposia.

M.Sc.(Physics) Semester-I

Choice Based Credit System

Core Paper C-1 : **CLASSICAL MECHANICS**
Paper - I

Max.Marks. 60
Time Duration - 3 Hours Min. Marks. 21

Instruction to Examiners

Paper shall consist of Two sections A & B. Paper Setter is required to set **ONE** short answer type question from each unit having internal choice in section A. Section B will consist of **FIVE** long answer type questions with **ONE** from each unit and student will answer any **THREE** questions. Each short answer questions shall be of 6 marks and long answer type question shall be of 10 marks.

Unit I

Newtonian mechanics of one and many particle system: Conservation laws, Constraints and their classification, Principle of virtual work: D'Almbert's principle in generalized coordinates, Lagrange's equation from D'Almbert's principle. Configuration space, Hamilton's principle deduction from D'Almberts principle, Generalized momenta and Lagrangian formulation of the conservation theorems, Reduction to the equivalent one body problem: Equation of motion and first integrals, differential equation for the orbit.

Unit II

The equations of canonical transformation and generating functions; The Hamilton Jacobi Action and Angel variables. Poisson's brackets; simple algebraic properties of Poisson's brackets. The equation of motion in Poisson's Brackets notation. Poisson theorem; principle of least action. The Kepler problem, Inverse central force field, Rutherford scattering.

Unit III

Theory of small oscillations, Equations of motion, Eigen frequencies and general equation of motion, normal modes and coordinates, Applications to coupled pendulum and linear bistable molecule. Rotating co-ordinate systems. Acceleration in rotating frames. Coriolis force and its terrestrial astronomical applications, Elementary treatment of Eulerian co-ordinates and transformation matrices. Angular momentum inertia tensor. Eular equations of motion for a rigid body. Torque free motion for a rigid body.

Unit IV

Symmetries of space and time. Invariance under galilion transformation, Covariant four dimensional formulation, 4-Vectors and 4-scalers. Relativistic generalization of Newton's laws, 4-momentum and 4-force, variance under Lorentz transformation relativistic mechanics. Covariant Lagrangian, covariant Hamiltonian, equations.

Unit V

The principle of equivalence, Relativistic theory of gravitation. Einstein's elevator, principle of general covariance, nature of the gravitational field. Energy momentum tensor. Einstein's field equations. The Schwarchild exterior solution of field equations, the experimental tests of the general theory relativity: The advance of the perihelion of Mercury, the deflection of light in a Schawarz child field, the gravitational shift of spectral lines.

Books Recommended:

1.	H.Goldstein (Addison Wesley)	Classical Mechanics
2.	N.C.Rana & P.S.Jog	Classical Mechanics
3.	Landau & Lifshitz (Pergamon Press)	Classical Mechanics
4.	A.Sommarfield (Academic Press)	Classical Mechanics
5.	R.G.Takwale & P.S.Puranik	Introduction to Classical Mechanics

Classical Mechanics

Course outcome:

Co1: This course will enable students to understand the concepts of classical theory with references to Newtonian mechanics.

Co2: Ability achieved to apply canonical transformation and Hamilton Jacobi problems.

Co3: It shall developed the ability to use different classical mechanics concepts related to astronomical and scattering applications.

Co4: In depth knowledge in pseudo forces and coriolis forces etc and their existence due to rotation of earth and related phenomena observed on earth would be understood by students.

M.Sc.(Physics) Semester-I
Choice Based Credit System

Core Paper C-2 :**QUANTUM MECHANICS-I**
Paper -II

Max.Marks. 60
Time Duration - 3 Hours Min. Marks. 21

Instruction to Examiners

Paper shall consist of Two sections A & B. Paper Setter is required to set **ONE** short answer type question from each unit having internal choice in section A. Section B will consist of **FIVE** long answer type questions with **ONE** from each unit and student will answer any **THREE** questions. Each short answer questions shall be of 6 marks and long answer type question shall be of 10 marks.

Unit I

Basic Postulates of quantum Mechanics, equation of continuity, Normality, orthogonality and closure properties of eigen functions, expectation values and Ethrentest theorems, solution of Schrodinger equation for one dimensional (a) Potential well (b) Potential step and (c) Potential barrier.

Unit II

Linear vector space, concept of Hibert space, bra and ket notation for state vector, representation of state vectors and dynamical variables by matrices and unitary transformation (Translation and rotation), creation and annihilation operators, matrices for x and p. Heisenberg uncertainty relation through operator (Schwartz Inequality).

Unit III

Solution of Schrodinger equation for (a) linear harmonic oscillator (b) hydrogen - line atom (c) square well potential and their respective application to atomic spectra, molecular spectra and low energy nuclear states (deutorn).

Unit IV

Angular momentum in quantum mechanics, Eigen values and Eigen function of L2 and L in term of spherical harmonics, commutation relation. Time independent perturbation theory. Non-degenerate and degenerate cases.

Unit V

Space time symmetries : Displacement in space, conservation of Linear momentum, Displacement in time : Conservation of energy, Rotation in space : conservation of angular momentum, space inversion parity, Time reversal Invariance, change of wave function under a gauge transformation, wave function in a field free region.

Books Recommended:

1.	L.I.Schiff	Quantum Mechanics
2.	S.Gasiorovvicz	Quantum Physics
3.	B.Craseman and J.D. Powell	Quantum Mechanics
4.	A.P.Messiah	Quantum Mechanics
5.	J.J. Sakurai	Modern Quantum Mechanics
6.	Mathews and Venkatesan	Quantum Mechanics

Quantum Mechanics – I

Course outcome:

CO1: Create ability to develop one and three dimensional harmonic oscillator differential equations by power series method in understanding hydrogen spectrum.

CO2: Ability to derive angular momentum operators and spherical harmonics with polar diagrams.

CO3: Ability to derive the time independent and time dependent perturbation equations and apply to explain different phenomenon.

CO4: Ability to apply approximation methods to understand various phenomenon, estimate ground state energy, etc.

M.Sc.(Physics) Semester-I
Choice Based Credit System

Core Paper C-3 : **ELECTRONIC DEVICES**
Paper -III

Max.Marks. 60
Time Duration - 3 Hours Min. Marks. 21
Instruction to Examiners

Paper shall consist of Two sections A & B. Paper Setter is required to set **ONE** short answer type question from each unit having internal choice in section A. Section B will consist of **FIVE** long answer type questions with **ONE** from each unit and student will answer any **THREE** questions. Each short answer questions shall be of 6 marks and long answer type question shall be of 10 marks.

Unit I

Unipolar Transistors : JFET,MOSFET and MESFET; structure derivations of the equations for I-V characteristics under different conditions. Charge Transfer Devices;CCD-structure,performance and applications. Unijunction Transistors & Programmable Unijunction Transistors(PUT)-Operation and IV characteristics. pnpn diodes,Silicon Controlled Rectifier(SCR),DIAC,TRIAC- structure, operation and characteristics.

Unit II

Photonic devices: radiative and non-radiative transitions, optical absorption, bulk and thin film photo conductive device (LDR), diode Photo detectors, Solar cell (open circuit voltage and short circuit current, fill actor), LED (high frequency limit, effect of surface and indirect recombination current, operation of LED), semi-conductors; diode lasers (conditions for population inversion in active region, light confinement factor, optical gain and threshold current for lasing.

Unit III

Microwave Devices,Tunnel Diodes-operation mechanism and I-V characteristics.Transferred Electron Devices: Gunn diodes-Structure ,formation and drift of space charge domains,operation and I-V characteristics. Avalanche transits time devices :READ, IMPATT and TRAPATT diodes-operation and characteristics.

Unit IV

Memory Devices: Read Only Memory (ROM) and Random Access Memory (RAM). Types of ROM: PROM, EPROM, EEPROM and EAPROM, Static and dynamic RAMs (SRAM & DRAM), characteristics of SRAM and DRAM. Hybrid Memories : CMOS and NMOS memories, Nonvolatile RAM, ferro-electric memories, charge coupled devices (CCD), storage devices : Geometry and organization of magnetic (FDD & HDD) and Optical (CD-ROM, CD-R, CD-R/W, DVD) Storage devices.

Unit V

Electro-optics, Magneto-optic and Acousto-optic effects, materials properties related to get these effect, important ferro electric, liquid crystal and polymeric materials for these devices, piezoelectric, electrostrictive and magnetostrictive effects. Important materials for these properties and their applicat6ions in sensors and actuator devices, acoustic delay lines, piezoelectric resonators and filters, high frequency piezoelectric devices-surface, acoustic wave devices.

Books Recommended:

1. SM Sze Wiley (1985) Semiconductors devices-physics technology
2. M.S.Tyagi Introduction to semiconductors devices
3. M Sayer and A Mani Singh Measurement instrumentation and experimental design in physics and engineering
4. Ajoy Ghatak and Thyagrajam Optical Electronics
5. R P Jain Modern Digital Design

Electronic Devices

Course outcome:

CO1: Detailed information regarding various electronic devices and their applications shall enable students develop Electronic circuits for electronic applications.

CO2: Develop ability to understand different photonic and Microwave devices for photonic and microwave applications.

CO3: Shall provide concepts of memory devices and electro- optics devices and their Applications and thus enable students to understand electronic devices and computer system.

M.Sc.(Physics) Semester-I
Choice Based Credit System

Generic Elective Paper GE-1 : **MATHEMATICAL PHYSICS**
Paper IV Max.Marks. 60
Time Duration - 3 Hours Min. Marks. 21

Instruction to Examiners
Paper shall consist of Two sections A & B. Paper Setter is required to set **ONE** short answer type question from each unit having internal choice in section A. Section B will consist of **FIVE** long answer type questions with **ONE** from each unit and student will answer any **THREE** questions. Each short answer questions shall be of 6 marks and long answer type question shall be of 10 marks.

Unit I
Differential equations : Recurrence relation, generating functions and orthogonality of Bessel functions of first and second kind, Hermite, Legendre, Associate Legendre and Laguerre Polynomials. Curvilinear co-ordinate system with specific cases of Cartesian, Cylinderical and Spherical coordinate systems.

Unit II
Integral transforms. Fourier integral. Fourier transform and inverse Fourier transforms. Fourier transform of derivatives. Convolution theorem. Elementary Laplace transforms. Laplace transform of derivatives. Application to a damped harmonic oscillator.

Unit III
Green's functions : Non-homogenous boundary value problems, Green's function for one dimensional problems, eigen function expansion of Green's function, Fourier transform method of constructing Green's function, Green's function for electrostatic boundary value problems and quantum-mechanical scattering problem.

Unit IV
Complex variables: Analyticity of complex functions. Cauchy Riemann equations. Cauchy theorem. Cauchy integral formula. Taylors, Maclaurin, Laurent series & mapping. Theorem of residues. Simple cases of contour integration. Jordan's lemma Integrals involving multiple valued unctions (Branch points).

Unit V
Introduction to Tensors: n-dimensional space, coordinate transformations, Indicial and summation conventions, Kronecker delta symbol, tensors of higher rank. Algebric operations on tensors, Quotient law; symmetric and anti-symmetric tensors, line element, metric tensor, covariant, contravariant and mixed, fundamental tensor. Christoffel symbols and their transformation laws, geodesics and its equation, Riemann-Christoffel's tensor its properties, covariant curvature tensor and its properties, contraction of Riemann Chrostoffel tensor, Bianchi identities

Books Recommended:

1.	L.A.Pipes	Mathematics of Engineers and Physicists
2.	Arfken	Mathematical Methods for Physicists
3.	P.K.Chattopadhyay	Mathematical Physics
4.	H.K.Das	Mathematical Physics
5.	Ghatak, Goyal & Guha	Mathematical Physics
6.	M.R.Spiegel (Schaum Series)	Complex variable & Laplace Transform

Mathematical Physics

Course outcome:

CO1: Shall provide detailed information about various mathematical functions and thus shall develop ability to understand various basic concepts of Physics.

CO2: Ability developed to solve integral and inverse Fourier and Laplace transforms.

CO3: Develop ability to analysis complex functions and multivalued functions.

CO4: Shall provide concepts of Tensorial quantities.

M.Sc.(Physics) Semester-II
Choice Based Credit System

Core Paper C-4 : **QUANTUM MECHANICS-II**
Paper V

Max.Marks. 60
Time Duration - 3 Hours Min. Marks. 21

Instruction to Examiners
Paper shall consist of Two sections A & B. Paper Setter is required to set **ONE** short answer type question from each unit having internal choice in section A. Section B will consist of **FIVE** long answer type questions with **ONE** from each unit and student will answer any **THREE** questions. Each short answer questions shall be of 6 marks and long answer type question shall be of 10 marks.

Unit I

Approximation method for bound states : Rayleigh-Schrodinger Perturbation theory of non-degenerate and degenerate levels and their application to perturbation of an oscillator, normal helium atom and first order stark effect in hydrogen. Variation method and its application to ground state helium, W K B Approximation method, connection formulae ideas on potential barrier with applications to theory of alpha decay.

Unit II

Time dependant perturbation theory : Methods of variation of constants and transition probability, adiabatic and sudden approximation, wave equation for a system of charged particles under the influence of external electromagnetic field, absorption and induced emission, Einstein's A and B coefficients and transition probability.

Unit III

Theory of Scattering, Physical concepts, scattering amplitude, scattering cross section. Born Approximation and partial waves, scattering by perfectly rigid sphere, complex potential and absorption, scattering by spherically symmetric potential, identical particles with spin, Pauli's spin matrices.

Unit IV

Schrodinger's relativistic equation (Klein-Gordon equation), Probability and current density, Klein-Gordon equation in presence of electromagnetic field, hydrogen atom, short comings of Klein-Gordon equation, Dirac's relativistic equation for free electron, Dirac's Matrices. Dirac's relativistic equation in electromagnetic field, negative energy states and their interpretation hydrogen atom, hyperfine splitting.

Unit V

Theory of Aharonov-Bohm experiment, variational methods; Variational principle, Helium atom, Hydrogen molecule, Ion Scattering theory : Partial waves, Determination of phase - shifts, Hard sphere scattering, Low energy scattering, Resonances.

Books Recommended:

1. LI Schiff — Quantum Mechanics
2. S. Gasiorowicz — Quantum Physics
3. B.Craseman and J J Powell — Quantum Mechanics (Addison Wessley)
4. A.Messiah — Quantum Mechanics
5. J.J. Sakurai — Modern Quantum Mechanics
6. Mathews and Venkatesan — Quantum Mechanics
7. A.K. Ghatak and Loknathan — Quantum Mechanics

Quantum Mechanics – II

Course outcome:

CO1: Ability to apply Born approximation to different scattering problems, i.e., square well potential and Yukawa Potentials, etc.

CO2: Ability to use variational techniques to solve quantum mechanical problems.

CO3: Ability to understand scattering by Born approximation, Partial Wave analysis and solve problems.

M.Sc.(Physics) Semester-II
Choice Based Credit System

Core Paper C-5 : **STATISTICAL MECHANICS**
Paper VI

Max.Marks. 60
Time Duration - 3 Hours Min. Marks. 21
Instruction to Examiners

Paper shall consist of Two sections A & B. Paper Setter is required to set **ONE** short answer type question from each unit having internal choice in section A. Section B will consist of **FIVE** long answer type questions with **ONE** from each unit and student will answer any **THREE** questions. Each short answer questions shall be of 6 marks and long answer type question shall be of 10 marks.

Unit I

Foundation of statistical mechanics, specification of states of a system contact between statistics and thermodynamics, classical ideal gas entropy of mixing and Gibb's paradox. Microcanonical ensemble, phase space, trajectories and density of states, Liouville theorem, canonical and grand canonical ensembles, partition function, calculation of statistical quantities, energy and density fluctuations.

Unit II

Statistics of ensembles, statistics of indistinguishable particles, density matrix Maxwell - Boltzmann, Fermi Dirac and Bose - Einstein statistics, properties of ideal Bose gases, Bose - Einstein condensation, properties of ideal Fermi gas, electron gas in metals, Boltzman transport equation.

Unit III

Cluster expansion for a classical gas, virial equation of state, mean field theory of lsing model in 3,2 and 1 dimension. Exact solution in one-dimension.

Unit IV

Thermodynamics fluctuation spatial correlation Brownian motion, Langevin theory, fluctuation dissipation theorem, the Fokker-Planck equation, Onsager reciprocity relations.

Unit V

Phase transition: phase transition of first and second kind, critical exponent, Yang and Lee theory, Production of low temperature, Approach to absolute zero by adiabatic demagnetization, measurement of low temperature Landau's theory Critical exponents.Order parameter fluctuation in Gaussian approximation.Scale invariance.

Books Recommended
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1.	F.Reif	Statistical and thermal Physics
2.	K Huang	Statistical Mechanics
3.	R.K.Pathria	Statistical Mechanics
4.	R Kubo	Statistical Mechanics
5.	Tandan	Statistical Physics

Statistical Mechanics

Course outcome:

CO1: Understanding the concepts of various ensembles in classical and quantum statistics and applicability

CO2: Understanding the concepts of various ensembles in classical and quantum statistics and applicability.

C03: Supper fluid nature of liquid helium and understanding of various phenomena.

M.Sc.(Physics) Semester-II
Choice Based Credit System

Core PaperC-6 : **ELECTRODYNAMICS & PLASMA PHYSICS**
Paper-VII

Max.Marks. 60
Time Duration - 3 Hours Min. Marks. 21

Instruction to Examiners

Paper shall consist of Two sections A & B. Paper Setter is required to set **ONE** short answer type question from each unit having internal choice in section A. Section B will consist of **FIVE** long answer type questions with **ONE** from each unit and student will answer any **THREE** questions. Each short answer questions shall be of 6 marks and long answer type question shall be of 10 marks.

Unit I

Field & potential due to quadrupole, Poisson and Laplace equations, field between two coaxial cylinders, multipole expansion of a charge distribution, uniqueness theorem, method of images, point source in front of infinite conducting plane, point source within two intersecting planes, Inversion in a sphere (grounded sphere, sphere not grounded), Laplace in spherical coordinates, Dielectric polarization, Gauss law in presence of dielectric, Clausius Mossotti equation.

Unit II

Biot-Savart's law, Ampere's circuital law and application to simple problems (circular loop and straight parallel conductors) magnetic vector potential, field from a circular loop using vector potential, concept of guage and gauge transformations, the magnetic dipole, Faradaya law of electromagnetic induction, Maxwell displacement current, Maxwells equations (integral and differential forms). Power/energy flow, plane waves, Helmholtz equation, Poynting vector, wave propagation in free space dielectric and conducting media.

Unit III

Plane waves in a non-conducting medium, linear and circular polarization, reflection and refraction of e.m.waves at the interface of a non-conducting media. Total internal reflection, waves in conducting medium electric dipole field and radiation, magnetic dipole field. retarded potential, Lenard Wiechert potential and field for a moving point charge, Larmor's radiation formula.

Unit IV

Elementary concept of occurrence of plasma. Gaseous and solid state plasma. Production of gaseous and solid state plasma. Plasma parameters. Plasma confinement pinch effect instability in a pinched-plasma column. Electrical neutrality in a plasma. Debye screening distance. Plasma oscillations: Transverse oscillations and longitudinal oscillations.

Unit V

Domain of Magnetohydrodynamics and plasma Physics : Magneto-nydrodynamic equations, magnetic hydro-static pressure hydrodynamic waves : Magneto-sonic and Alfven waves, particle orbits and drift motion in a plasmas, Experimental study of Plasma, the theory of single and double probes.

Books Recommended:

1.	Bitteneerort	Plasma Physics
2.	Chen	Plasma Physics
3.	Gupta, Kumar, Singh	Electrodynamics
4.	Sen	Plasma State and matter
5.	Jackson	Classical electrodynamics
6.	Pamolsky & Philips	Classical electricity and Magnetism

Electrodynamics and Plasma Physics

Course outcome:

CO1: Electrodynamics and plasma physics belong to basic research disciplines that have many different areas of applications; students will be well acquainted with fundamental and applied aspects

CO2: A student shall be equipped with strong foundations of electrodynamics and plasma physics which will help to understand theories of communication electronics, dielectrics, radio wave propagation and various properties of plasma

M.Sc.(Physics) Semester-II
Choice Based Credit System

Generic Elective: Paper GE-2 : **ATOMIC & MOLECULAR PHYSICS-I**
Paper-VIII

Max.Marks. 60
Time Duration - 3 Hours Min. Marks. 21

Paper shall consist of Two sections A & B. Paper Setter is required to set **ONE** short answer type question from each unit having internal choice in section A. Section B will consist of **FIVE** long answer type questions with **ONE** from each unit and student will answer any **THREE** questions. Each short answer questions shall be of 6 marks and long answer type question shall be of 10 marks.

Unit I

Quantum states of one electron atom. Atomic orbital. Hydrogen spectrum, Paulis principle, Spectra of alkali elements, Spin orbit interaction and line structure of alkali Spectra. Methods of molecular quantum mechanics, Thomas Fermi statistical model, Hartree and Hartree fock method, Two electron system. Interaction energy in L-S and J-J coupling, hyperfine structure (qualitative), line broadening mechanisms (general ideas).

Unit II

Types of molecules. Diatomic linear. Symmetric top, asymmetric top and spherical top molecules. Rotational spectra of diatomic molecules as a rigid rotator, Energy level and Spectra of non-rigid rotator, intensity of rotational lines.

Unit III

Vibrational energy of diatomic molecule, diatomic molecule as a simple harmonic oscillator, Energy levels and spectrum, Morse potential energy curve, Molecules as vibrating rotator, Vibration spectrum of diatomic molecule PQR branches, IR spectrometer (qualitative).

Unit IV

Introduction to ultraviolet, visible and infra-red spectroscopy, Raman spectroscopy; Introduction, pure rotational and vibrational spectra, Techniques and instrumentation, Photo electron spectroscopy, elementary idea about photoacoustic spectroscopy and Mossbauer spectroscopy (principle).

Unit V

Group Theory - concept of group, symmetry groups of square, multiplication table of C_{4v} representation theory of finite groups. Properties of representation of a group, reducibility of a representation, Theorem on representation. Irreducible representation. Schur's Lemma 1 & 2 and orthogonality theorem, characters of a representation, orthogonality of characters, the character table of C_{2V}, C_{3V}, & C_{4V} Point groups, Application of group theory to molecular vibration.

Books Recommended:

1.	H.E. White	Introduction to atomic spectra
2.	C.B. Banwell	Fundamental of molecular spectroscopy
3.	Walker and Strnghem	Spectroscopy Vol. I, II and III
4.	G.M. Barrow	Introduction to molecular spectroscopy
5.	Herzberg	Spectra of diatomic molecules
6.	Jeanne L and McHale	Molecular Spectroscopy
7.	J.M.Brown	Molecular Spectroscopy
8.	P.F. Bemath	Spectra of atoms and molecules
9.	J.M.Halian	Modern Spectroscopy

Atomic and Molecular Physics

Course outcome:

CO1: To understand the basic mechanism taking place inside the atom and molecule.

CO2: To understand the spectrum of Hydrogen like atoms, molecular structure and Spectroscopy.

CO3: To distribute electrons in elements and to analyze/interpret rotational and vibrational spectra.

CO4: Shall provide concepts of spectroscopy and their applications.

M.Sc.(Physics) Semester-III
Choice Based Credit System

Core PaperC-7 : **NUCLEAR AND PARTICLE PHYSICS**

Paper-IX Max.Marks. 60

Time Duration - 3 Hours Min. Marks. 21

Instruction to Examiners

Paper shall consist of Two sections A & B. Paper Setter is required to set **ONE** short answer type question from each unit having internal choice in section A. Section B will consist of **FIVE** long answer type questions with **ONE** from each unit and student will answer any **THREE** questions. Each short answer questions shall be of 6 marks and long answer type question shall be of 10 marks.

Unit I

Nuclear Interaction and Nuclear reaction:

Nuclear forces, exchange and tensor forces, meson theory of nuclear forces, Low-energy n-p scattering and spin dependence of n-p forces. Direct and compound nuclear reaction mechanism, reciprocity theorem.

Unit II

Accelerators of charged particles:

Study of cyclotron, phase stability, frequency modulated cyclotron (synchorocyclotron) magnetic induction accelerator (Betatron), Electron synchrotron and linear accelerator (Linac).

Unit III

Nuclear models:

Liquid drop model, Bohr-wheeler's theory of nuclear fission, shell model, spin orbit interaction, magic number, spin and angular momenta of nuclear ground state, nuclear quadrupole moment.

Unit IV

Nuclear decay and elementary particles:

β Decay, general features of β ray spectrum, Fermi theory of β decay, selection rules, parity in β decay, multipole radiation, internal conversion, nuclear isomerism.

Unit V

Elementary particles:

Classification of elementary particles, fundamental interaction, parameters of elementary particles. Symmetry and conservation laws, symmetry schemes of elementary particles SU(3).

Books Recommended:

1. Introduction to Nuclear physics : H.A. Enge
2. Nuclear radiation detectors : S.S.Kapoor and V.S.Ramamurthy
3. Atomic and Nuclear Physics : S.N.Ghoshal
4. Nuclear and Particle Physics : D.C. Tayal
5. Nuclear Physics : R.C. Sharma
6. Introduction to Nuclear Physics : Krane
7. Nuclear physics Principles & Application : Lilley

Nuclear and Particle Physics

Course outcome:

CO1: Understand the basic nuclear properties and phenomena.

CO2: Understand the nuclear transformations.

CO3: Understand the nuclear reactions mechanism.

CO4: Understand about the elementary particles and their quantum number.

CO5: Understand accelerator technology applied to high energy physics.

M.Sc.(Physics) Semester-III Paper-IX
Choice Based Credit System

Core Paper C-8 : **CONDENSED MATTER PHYSICS**
Paper-X Max.Marks. 60
Time Duration - 3 Hours Min. Marks. 21
Instruction to Examiners

Paper shall consist of Two sections A & B. Paper Setter is required to set **ONE** short answer type question from each unit having internal choice in section A. Section B will consist of **FIVE** long answer type questions with **ONE** from each unit and student will answer any **THREE** questions. Each short answer questions shall be of 6 marks and long answer type question shall be of 10 marks.

Unit I

Crystal Structure : Bravais lattice in two and three dimension. Simple crystal structures: Hexagonal close packed structure, Diamond structure, zinc blende structure, chloride structure, cesium chloride structure.

Unit II

Crystal diffraction by X-Ray:
Reciprocal lattice, Reciprocal lattice of bcc and fcc lattice. Relation between crystal lattice axes and crystal reciprocal lattice axes. Bragg diffraction. Condition in term of reciprocal lattice vector. Brillouin zones.

Unit III

Elastic properties of solids:
Stress and strain components, elastic compliance and stiffness constants, elastic energy density, reduction of number of elastic constants, elastic stiffness constants for isotropic body, elastic constant for cubic isotropic bodies, elastic waves, waves in (100) direction, experimental determination of elastic constants.

Unit IV

Lattice vibration and phonons:
Lattice dynamic of a diatomic linear lattice. Lattice vibrational spectrum. The concept of phonons momentum of phonons. Inelastic scattering of photons by phonons. Inelastic scattering of neutrons by phonons. Inelastic scattering of X-Ray.

Unit V

Thermal properties and band theory of solids:
Anharmonicity, thermal expansion, thermal conductivity, equation of state of solids, gruneisen constant. Band theory, classification of solids, concepts of effective mass. Fermi surfaces, anomalous skin effect, De Hass van alphen, cyclotron resonance, magneto resistance.

Books Recommended:

1. Verma and Srivastava : Crystallography for solid State physics.
2. Azaroff: Elementary to Solids.
3. Omar: Introduction Solid State Physics
4. Kittle : Solids State Physics
5. Huang : Theoretical Solids State Physics
6. Weertman and weertman : Elementary Dislocation Theory
7. Buerger : Crystal Structure Physics.
8. Maudelung : Introduction to solid State Physics.

CONDENSED MATTER PHYSICS

Course outcome:

CO1: Knowledge and understanding of solid state materials for their basic properties and possible technological applications.

CO2: Shall enhance the knowledge of students regarding thermal properties and elastic properties.

CO3: The use of fundamental properties and other well developed mechanisms / theories of solid state materials for their better applications in various technological fields.

M.Sc.(Physics) Semester-III
Choice Based Credit System

Discipline Centric
Elective Paper DCE-1 :**DIGITAL ELECTRONICS**
Paper-XI(I) Max.Marks. 60
Time Duration - 3 Hours Min. Marks. 21
Instruction to Examiners

Paper shall consist of Two sections A & B. Paper Setter is required to set **ONE** short answer type question from each unit having internal choice in section A. Section B will consist of **FIVE** long answer type questions with **ONE** from each unit and student will answer any **THREE** questions. Each short answer questions shall be of 6 marks and long answer type question shall be of 10 marks.

Unit I
Codes : BCD, Gray, ASCII, EBCDIC, Demorgans theorem, Gates:OR, AND, NOT, NOR, OR, NAND, XOR, XNOR, Boolean algebra, Karnaugh map.

Unit II
Logic Family of gates, TTL circuits - TTL AND, OR, NOT, NAND AND NOR gates Totempole, open collector and Tristate Configuration Adder and Subtractor circuit Design. Multiplexers and Demultiplexers Encodes and decoders.

Unit III
Flip-Flops : R-S,D, J-k, J-k Master slave flip flop, race around condition registers, shift registers (left and right shift)

Unit IV
Counters-asynchronous (ripple) counter, synchronous (parallel) counter, MOD-5 counter and MOD-10 counter, BCE counter, Up-Down counter, Shift Register counter (Ring counter)

Unit V
Digital to analog conversion (Binary weighted register method, R-2R ladder network method, single slope, equal slope, successive approximation ADC)

Books Recommended:

1. A.P.Malvino and Donald P.Leach. Digital principles and applications Tata Mcgraw-Hill company, New Delhi, 1993
2. Ramesh S.Gaonkar Microprocessor Architecutre, Programming and Applications with 8085/8086 by, Wiley-Eastern Ltd. 1987.
3. Digital Electronics-S.N.Ali
4. Digital Electronics-Morris Mano
5. Microprocessor and Microcomputers-B.Ram-Dhanpat Rai publication V edition.

Digital electronic

Course Outcome:

CO1. This course shall will the capability the students to words the Hardware design and Software application of computer system.

CO2. Shall give the concepts of logic gates and various combinational logic circuits.

CO3. Ability to understand various sequential logic circuits including register and counter circuits among students.

CO4. It will give an idea of interfacing circuits of basic micro processing circuits.

M.Sc.(Physics) Semester-III
Choice Based Credit System

Discipline Centric

Elective Paper DCE-2 : **Energy Physics**

Paper-XI(II) Max.Marks. 60

Time Duration - 3 Hours Min. Marks. 21

Instruction to Examiners

Paper shall consist of Two sections A & B. Paper Setter is required to set **ONE** short answer type question from each unit having internal choice in section A. Section B will consist of **FIVE** long answer type questions with **ONE** from each unit and student will answer any **THREE** questions. Each short answer questions shall be of 6 marks and long answer type question shall be of 10 marks.

Unit I

Fossil fuels and Alternate Sources of Energy: Fossil fuels and nuclear energy, their limitation, need of renewable energy, non-conventional energy sources. An over view of developments in offshore wind energy, Tidal energy, Wave energy systems, Ocean Thermal energy conservation, Solar energy, biomass, biochemical conservation, biogas generation, geothermal energy, tidal energy, hydroelectricity.

Unit II

Biomass energy- classification-photosynthesis-biomass conversion process-gobar gas plants-wood gasification-ethanol from wood- advantages and disadvantages of biomass as energy source.

Geothermal energy, Geothermal sources, Geothermal techniques, wind energy fundamental of wind energy, wind turbines and different electrical machines in wind turbines, Power electric interfaces and grid connection topologies. Ocean thermal energy conversion (OTEC)-energy from waves and tides (basic ideas, nature, applications, merits and demerits of these)., wave energy devices

Unit III

Solar energy: Solar energy ,its importance, storage of Solar energy, solar pond, non convective solar pond, application of solar pond and Solar energy, solar water heater, flat plate collector, solar distillation, solar cooker, solar green houses, solar cell, working principle and characterization, absorption air conditioning. Need and characteristics of photovoltaic (PV) systems,PV models and equivalent circuits, and sun tracking system.Carbon captured technologies, cell battries, power as consumption, environmental issues and Renewable sources of enegy, sustainability.

Unit IV

Hydro energy: Hydropower resources, Hydropower technologies, environmental impact of Hydropower sources.

Piezoelectric Energy harvesting: Introduction, Physics and characteristics of Piezoelectric effect, materials and mathematical description of Piezoelectricity, Piezoelectric parameter and modeling Piezoelectric generators, Piezoelectric energy harvesting applications, Human Power.

Unit V

Energy Storage and Impact of non-conventional energy: Conversion of energy-pattern of energy consumption in domestic ,industrial,transpotation,agricultural sectors- conservation principles in these sectors-energy crisis and possible solutions-energy options for the developing countries-energy storage and hydrogen as a fuel(basics)-impact due to non -conventional energy sources-global warming.

Books Recommended:

1. Solar energy G.D. Rai ,Ed. V. 1995.
2. Solar energy S.P.Sukhatme, Tata McGraw- Hill publishing company ,Ed.II,1997.
3. Non conventional Energy sources, G.D.rai,4th edition ,1997
4. Energy Technology S. Rao and Dr.B.B.Parulekar 2nd edition,1997
5. Power plant technology A.K.Wahil,1993
6. Renewable energy : Power for a sustainable future Godfery Boyle ,Alden Oess Ltd.,Oxford ,1996
7. Energy Model for 2000 and beyond Jyoti Parikh, , Tata McGraw- Hill publishing company , New Delhi,1997

Energy Physics

Course Outcome:

Co1: Provide knowledge of alternate sources of energy among students and enable their capability in building energy systems using such sources.

Co2: Shall give concepts of biomass and geothermal energy source.

Co3: This course shall make aware the students about solar energy and its application in developments of photo voltaic system.

Co4: Give knowledge about hydro energy and harvesting.

M.Sc.(Physics) Semester-III
Choice Based Credit System

Discipline Centric

Elective Paper DCE-3 : **Space Technology**

Paper-XI(III) Max.Marks. 60

Time Duration - 3 Hours Min. Marks. 21

Instruction to Examiners

Paper shall consist of Two sections A & B. Paper Setter is required to set **ONE** short answer type question from each unit having internal choice in section A. Section B will consist of **FIVE** long answer type questions with **ONE** from each unit and student will answer any **THREE** questions. Each short answer questions shall be of 6 marks and long answer type question shall be of 10 marks.

Unit 1

Basic Concepts of Earth's Atmosphere Atmospheric nomenclature, Hydrostatic equation scale height, Geopotential height, Exosphere and gaseous escape, Chemical concepts of atmosphere, Thermodynamic considerations, elementary chemical kinetics composition and chemistry of middle atmosphere and thermosphere. Thermal balance in the atmosphere, models of neutral atmosphere (CIRA, US Standard atmosphere)

Unit 2

Solar Radiation and its Effects on the Atmosphere Solar radiation at the top of the atmosphere, Attenuation of solar radiation in the atmosphere, radiative transfer, thermal effect of radiation, photochemical effects of radiation, Airglow Structure and Variability of Earth's Ionosphere Introduction to ionosphere, photochemical processes, Chapman's theory of photo ionization, production of ionospheric layers, loss mechanisms and chemistry of ionospheric regions, morphology of the ionosphere

Unit 3

Ionosphere Propagation and Measurement Techniques Effect of Ionosphere on radiowave propagation, Refraction, Dispersion and polarization, Magnetoionic theory, critical frequency and virtual height, Oblique propagation and maximum usable frequency, Ground based techniques: ionosondes, radars, scintillation and TEC, ionospheric absorption, rocket and satellite borne techniques: Langmuir probe, electric field probe mass spectrometer

Unit 4

Elements of Solar Physics Structure and composition of the Sun, sun as a source of radiation, sunspots an solar cycles, solar flares, coronal mass ejection Magnetosphere of Earth Solar wind and its characteristics, Interplanetary magnetic field and sector structure, Formation of

geomagnetic cavity, magnetopause, magnetosheath and bow shock, polar cusp and magnetotail, Plasmasphere and Van Allen radiation belts

Unit 5

Concepts and Foundations of Remote Sensing Energy sources and Radiation principles, Energy interactions in the atmosphere, energy interactions with earth surface features, Data acquisition and Interpretations, Reference data, The Global Positioning System An ideal remote sensing system, Characteristics of real remote sensing system, Practical applications of remote sensing, Land and Geographic Information System

Books Recommended:

1. Physics of the Space Environment T.I. Gombosi, (CUP)

2. The Solar-Terrestrial Environment: JK. Hargreaves (CUP)

3. Remote Sensing and Image Interpretation: T.M. Lillesand and R.L. Kiefer, (John Wiley & Sons, 4th Edition)

Space Technology

Course Outcome:

CO1: Students will understand the basic laws of Physics governing the satellites in its orbits with their Applications.

CO2: How the power is generated in space? Powers storage devices and deep space requirements will be very interesting for them. Students will also learn about the ground and space based observation techniques.

CO3: Students will understand about the space technology and its application in Earths and space environments.

M.Sc.(Physics) Semester-III
Choice Based Credit System

Discipline Centric

Elective Paper DCE-4 : **Remote Sensing & Applications**

Paper-XI(IV) Max.Marks. 60

Time Duration - 3 Hours Min. Marks. 21

Instruction to Examiners

Paper shall consist of Two sections A & B. Paper Setter is required to set **ONE** short answer type question from each unit having internal choice in section A. Section B will consist of **FIVE** long answer type questions with **ONE** from each unit and student will answer any **THREE** questions. Each short answer questions shall be of 6 marks and long answer type question shall be of 10 marks.

Unit 1

Elements of Photographic Systems Early history of Aerial photography, Basic negative to positive photographic sequence, Film exposure, Film density and characteristic curves, structure & Spectral sensitivity of black and white, color and color infrared films, film resolution, Aerial cameras, filters, electronic imaging, multiband imaging

Unit 2

Principles of Photogrammetry Basic geometric characteristics of aerial photograph Photographic scale, Area measurement, Relief displacement of vertical features, image parallax, measurement of object height and ground coordinate, Mapping with aerial photographs

Unit 3

Visual Image Interpretation Fundamentals of visual image interpretation, Basic visual image interpretation equipment, Land use/land cover mapping, Geologic and soil mapping, Forestry mapping, water resources and wetland mapping

Unit 4

Multispectral and Thermal Scanning Across tack and along track scanning, Operating principles of multi spectral scanners, Across track thermal scanning, thermal radiation principles, interpreting thermal scanner imagery, Radiometric calibration of thermal scanners. Temperature mapping with thermal scanner data

Unit 5

Digital Image Processing Introduction, Image rectification and restoration, Image enhancement, contrast manipulation, spatial feature manipulation, image classification, different classification schemes, Classification accuracy assessment, Image transmission and compression Earth Resources Satellites Early history of space imaging Landsat 1-4 system, Landsat image interpretation, SPOT satellite program, IRS system, data and applications

Books Recommended:

1. Remote sensing and image interpretation. T.M. Lillesand and R.W. Kiefer (4th ed.) John Wiley and Sons, 2002

2. Fundamentals of Remote Sensing – George Joseph Univ. Press

Remote sensing and Applications

Course Outcome:

CO1: Students will have thorough idea about the various types of camera and sensors used in remote sensing.

CO2: They will also be able to understand the defects and its solutions in the space borne images.

CO3: Students will be able to interpret the remote sensing images for different aspects.

M.Sc.(Physics) Semester-III
Choice Based Credit System

Generic
Elective PaperGE-3 : **Informatics**

Paper-XII Max.Marks. 60
Time Duration - 3 Hours Min. Marks. 21

Instruction to Examiners
Paper shall consist of Two sections A & B. Paper Setter is required to set **ONE** short answer type question from each unit having internal choice in section A. Section B will consist of **FIVE** long answer type questions with **ONE** from each unit and student will answer any **THREE** questions. Each short answer questions shall be of 6 marks and long answer type question shall be of 10 marks.

Unit I

Concept of information and its unit, difference between data and information, features of information. Average Information and Information rate. Data transmission concept-characteristics of data transmission circuits. Concept of analogue and digital signal in data transmission. Coding to increase average information per bit/per word. Shannon's theorem and channel capacity. Coding efficiency, Shannon Fano and Huffman coding procedures. Error detecting and correcting codes-Block and convolution codes.

Unit II

The Sampling theorem, Pulse Code Modulation (PCM)-concept of quantisation, quantisation error, companding, time division multiplexing, PCM system and its band width. Delta Modulation, Phase shift keying, Differential phase shift keying, quadrature phase shift keying, optimum modulation system based on information theory Modems.

Unit III

Organisation of Digital computer, Brief overview of input and output devices, CPU-evolution of microprocessors, Semiconductor memories (RAM and ROM) : organisation and their characteristics, Cache memory, CDROM, Magnetic disk, Software Concept : types of software and their features. System utility software. Role of software in information technology.

Computer language : Features of low level and high level programming languages. Assemblers & compilers, generation of computer languages.

Unit IV

Concept of OS : basic functions and types of OS, Salient features of batch processing, on line processing, single use, multi user, time shared, multi tasking, multi programming and real time systems. Overview of UNIX concept of windows and their basic commands, elements of window NT, concept of booting, batch file, config, sys file, filtering, redirecting and piping.

Unit V

Introduction to communication network and their types, Elements of computer network and advantages. Design features of computer network (Line capacity allocation, routing procedure, flow control procedure). Classification of network-LAN, WAN and MAN. Network topologies-basic features of Bus, Hierarchical, Star Ring and Mesh topologies, Network protocols : seven layers of OSI reference model and its comparison with TCP/IP, History of internet and important features, basic services of internet-www, email, telnet, chat and news.

References

1. Information Technology-Satish Jain (BPB Publication)
2. Information Technology-V.P. Singh & M. Singh (Asian Publication)
3. Principles of Data communication – R.W. Lucky, J. Salz & E.J. Weldon Jr. (McGraw Hill Co.).
4. Principles of Communication Systems – H. Taub & D.L. Schilling (Tata McGraw Hill).
5. Communication Systems : Analog & Digital – R.P. Singh & S.D. Sapre (Tata McGraw Hill).
6. Modern Digital & Analog Communication Systems-B.P. Lathi (Oxford Univ. Press, N. Delhi).
7. Microprocessors and Microcomputers – B. Ram
8. Introduction to Microprocessors – A.P. Mathur
9. Computer Network : Protocol Standards and Interfaces – Uyless Black (PHI)

Informatics

Course Outcome:

Co1: Basic knowledge of various information systems and concepts of information transfer through remote methods will be provided.

Co2: It will provide information about computer anatomy.

Co3: Students shall learn concepts of O.S. and network technology

M.Sc.(Physics) Semester-IV
Choice Based Credit System

Core Paper C-9: **LASER PHYSICS**
Paper-XIII Max.Marks. 60
Time Duration External Examination - 3 Hours Min. Marks. 21
Instruction to Examiners

Paper shall consist of Two sections A & B. Paper Setter is required to set **ONE** short answer type question from each unit having internal choice in section A. Section B will consist of **FIVE** long answer type questions with **ONE** from each unit and student will answer any **THREE** questions. Each short answer questions shall be of 6 marks and long answer type question shall be of 10 marks.

Unit I

Basic principles of laser :

Introduction to laser, spontaneous and stimulated emission, Einstein coefficients. Idea of light amplification. Population invertion, laser pumping schemes for two and three level system with threshold condition for laser oscillation.

Unit II

Properties of Laser Beams and Resonators :

Properties of Laser Temporal coherence, spatial coherence, directionality and monochromatic of laser beam, resonators, vibrational mode of resonators, laser amplification, open resonator.

Unit III

Types of lasers :

Solid state lasers i.e.Ruby Laser, Nd-Yag Laser, Semiconductor laser, Gas laser i.e. Carbon dioxide Laser, He-Ne Laser, Basic idea about liquid laser, Dye laser and chemical laser i.e. HCL and HF lasers.

Unit IV

Application of Lasers :

Holography and its principle, theory of holograms, reconstruction of image, characteristics of Holographs, Application of lasers in chemistry and optics laser in Industry i.e.laser belding, Hole drilling, laser cutting, application of lasers in medicine.

Unit V

Basic idea about non-linear optics :

Harmonic generation, second and third harmonic generation, phase matching, optical mixing, parametric generation of light, self-focusing of light.

Books Recommended:

1. Laser-swelto
2. Optical electronics-Yarive
3. Laser spectra scopy-demtroder
4. Laser spectroscopy and Instrumentation Demotroder
5. Molecular spectra scopy - King
6. Non linear optics by B.B.Laud

LASER PHYSICS
Course Outcome:

Co1: Students shall understand through this course shall learn about concepts of lasers and its application in development of lasing system.

Co2: Students shall learn about basic concepts of non-linear optics for laser technology.

M.Sc.(Physics) Semester-IV
Choice Based Credit System

Core Paper C-10: Modern Experimental Techniques
Paper-XIV Max.Marks. 60
Time Duration External Examination - 3 Hours Min. Marks. 21
Instruction to Examiners

Paper shall consist of Two sections A & B. Paper Setter is required to set **ONE** short answer type question from each unit having internal choice in section A. Section B will consist of **FIVE** long answer type questions with **ONE** from each unit and student will answer any **THREE** questions. Each short answer questions shall be of 6 marks and long answer type question shall be of 10 marks.

Unit 1

Radiation sources, Radiation interactions, Radiation detectors – gas filled detectors – scintillation detectors – semiconductor detectors

Unit 2

Introduction to production of X-ray & X-ray spectra, Instrumentation, X-ray generation, collimators, filters, detectors, X-ray absorption methods, X-ray fluorescence methods, XF – Spectrometer (XFS), Electron spectroscopy for chemical analysis (ESCA)

Unit 3

Nuclear Magnetic Resonance (NMR) spectroscopy, basic principles, nuclear magnetic energy levels, magnetic resonance, NMR Spectrometer Electron Spin Resonance spectroscopy, ESR spectrometer, ESR spectra, Hyperfine interactions

Unit 4

Mass spectroscopy – principle, spectrometer, and its operation, resolution, Mass spectrum, applications Infrared Spectroscopy, correlation of IR spectra with molecular structure, Instrumentation

Unit 5

Mossbauer Spectroscopy – Mossbauer effect, spectrometer, 57 Fe Mossbauer spectroscopy, nuclear hyperfine interactions Neutron diffraction, neutron diffractometer (position sensitive diffractometer)

Books Recommended:

1. Instrumentation Methods of analysis: VIIth Edition, Willard Meritt, Dean, Settle, CBS publishers & distributors

2. Mossbauer Spectroscopy : Leopold May, Plenum Press, N.Y.

3. Neutron Diffraction: G.C. Becon

4. X-Ray diffraction: B.D. Culity, Edison Weisley

5. Radiation Detection & Measurement: Glenn F. Knoll, McGraw Hill

Modern Experimental Techniques

Course Outcome:

Co1: Capability of students in experiments as tools for research activities shall be developed.

Co2: Various types of analylitical techniques would be learned in the students like, nuclear techniques, Condensed matter techniques and spectroscopic techniques.

M.Sc.(Physics) Semester-IV
Choice Based Credit System

Discipline Centric

Elective Paper DCE-5 : **Advanced Electronics**

Paper-XV(I) Max.Marks. 60

Time Duration - 3 Hours Min. Marks. 21

Instruction to Examiners

Paper shall consist of Two sections A & B. Paper Setter is required to set **ONE** short answer type question from each unit having internal choice in section A. Section B will consist of **FIVE** long answer type questions with **ONE** from each unit and student will answer any **THREE** questions. Each short answer questions shall be of 6 marks and long answer type question shall be of 10 marks.

Unit I

OP-AMP :

Differential amplifier circuit configurations : dual input balanced output dual input, single input unbalanced output (ac analysis) only, block diagram of a typical op amp analysis, schematic symbol of an op-amp.

Unit II

OP-AMP Parameters : Ideal op-amp.; Op-amp parameters; input offset voltage, input offset current, input bias current, CMRR, SVRR, large signal voltage gain, Slew rate, Gain band width product, output resistance supply currents power consumption, inverting and non-inverting inputs.

Unit III

Application of OP-AMP :

Inverting and non-inverting amplifier, summing, scaling and averaging amplifier, integrator and differentiator. Oscillator Principles: oscillator types, frequency, stability response, the phase shift oscillator, Wein-bridge oscillator, L-C tunable oscillator, square wave generator.

Unit IV

Microprocessors and Micro Computers :

Microprocessor and Architecture : Intel 8086, Microprocessor architecture modes of memory addressing, 8086/8088 Hardware specification : Pin-outs and pin functions, clock generator (8284A) Bus buffering and latching, Bus timing, Ready and wait state, Minimum mode versus maximum mode.

Unit V

Programming the Microprocessors :

Addressing modes : Data addressing modes, program memory addressing modes, stack memory-addressing modes. Instruction set; data movement Instruction, Arithmetic and login instructions, program control instruction.

Books Recommended:

1. Digital Principles and Application : A.P.Malvino & D.P.Leech
2. Op-Amps & Linear Integrated circuits : R.A. Gayakwad
3. Electronics : D.S. Mathur
4. Digital Principles & Applications : Malvino & Leech
5. Microprocessor Architecture, Programming & Applications with 8085/8086 : R.S.Gaonker
6. Microprocessor & Digital Systems : D.V.Hall
7. Fundamental of Electronics : Borker

Advanced Electronics

Course Outcome:

Co1: Students shall gain knowledge about linear integrated circuits with emphasis to operational capabilities and their applications.

Co2: Micro processors concepts would be build among students.

Co3: Detailed H/W knowledge of 8086 ups and assembly language programming shall lead students to design dedicated / general purpose circuits

M.Sc.(Physics) Semester-IV
Choice Based Credit System

Discipline Centric

Elective Paper DCE-6 : **Astrophysics**

Paper-XV(II) Max.Marks. 60

Time Duration - 3 Hours Min. Marks. 21

Instruction to Examiners

Paper shall consist of Two sections A & B. Paper Setter is required to set **ONE** short answer type question from each unit having internal choice in section A. Section B will consist of **FIVE** long answer type questions with **ONE** from each unit and student will answer any **THREE** questions. Each short answer questions shall be of 6 marks and long answer type question shall be of 10 marks.

Unit I

Observational data : Astronomical coordinates, determination of mass, rating, luminosity, temperature and distance of a star, steller classification and its interpretation, H.R. diagram of clusters, empirical mass luminosity relation.

Unit II

Physical characteristics of the sun, basic data, solar relation and solar magnetic field. Quiet Sun : Photosphere, hydrogen convection zone and granulatin, chromosphere, spicules, corona. Active sun : development of centre of activity, sunspots, prominences and lares. Theory of the general solar magnetic field, sunspot and solar flares, solar wind, solar radiations, solar X – radiation.

Unit III

Stellar interior, Energy generation in stars, contraction hypothesis. Nuclear Processes, P-P and C-N Cycles, reaction rates. Evolution of stars premain sequence, main sequence and post-main sequence stages.

Unit IV

Dense stars, white dwarfs, internal structure, mass-radius relation, mass limit, sources of energy, neutron stars. Variable stars, Pulsating stars, velocity and light curves, classification, dynamics of steller pulsation, Novae and Super-Novae, Crab Nabula, optical, radio and X-ray emission.

Unit V

Galaxies, classification, Milky way, Rotation, Galactic cluster, Peculiar galaxies, Models of the Universe, Radio astronomy, Pulsars, Quasars, Microwave background radiation, X-ray sources.

Books Recommended:

1. Source Book of Space Physics - Glasstone
2. Space Science & Earth Environment – S.S. Degaonkar
3. Star and Planet – Abbeti
4. The Sun – Abbeti
5. Solar Terrestrial Physics-Akasofu and Chapman
6. Astronomy-D.H. Menzel
7. The State of Universe-Ed. By G. Bath
8. Astronomy-Baker
9. Articles from Journals, Space Science Reviews.

Astrophysics

Course Outcome:

Co1: To develop ideas about the evolution of with special emphasis on the sun & various associated phenomena.

Co2: To develop basic concepts of astronomical observations & idea about Galaxies, Universe & associated process.

M.Sc.(Physics) Semester-IV
Choice Based Credit System

Discipline Centric

Elective Paper DCE-7 : **Environmental Physics**

Paper-XV(III) Max.Marks. 60

Time Duration - 3 Hours Min. Marks. 21

Instruction to Examiners

Paper shall consist of Two sections A & B. Paper Setter is required to set **ONE** short answer type question from each unit having internal choice in section A. Section B will consist of **FIVE** long answer type questions with **ONE** from each unit and student will answer any **THREE** questions. Each short answer questions shall be of 6 marks and long answer type question shall be of 10 marks.

Unit I - **Essential of Environmental Physics**

Structures and thermodynamics of atmosphere. Composition of air. Green house effect. Transport of matter, energy and momentum in nature. Stratification and stability of atmosphere. Laws of motion, hydrostatic equilibrium .General circulation of Tropics. Elements of weather and climate of India.

Unit II **Solar and Terrestrial Radiation**

Physics of radiation. Interaction of light with matter .Rayleigh and Mie scattering. Laws of Radiation (Kirchhoff's law, Plank's law, Wien's displacement law, etc.)

Solar and Terrestrial spectra. UV radiation. Ozone depletion problem. IR absorption energy balance of the earth atmospheric system

Unit III **- Environmental Pollution and Degradation**

Elementary Fluid Dynamics .diffusion, Turbulence and turbulent diffusion. Factors governing air, water and noise pollution. Air water quality standards. Waste disposal .heat and Island effect .Land sea Breeze. Puffs and plumes. Gaseous and particulate matters .wet and dry deposition.

Unit IV – **Environmental changes Remote sensing**

Energy sources and combustion processes .Renewable sources of energy. Solar energy, wind energy, bio-energy, hydropower, fuel cells, nuclear energy. Forestry and bioenergy.

Unit V **Global and Regional Climate**

Elements of weather and climate .Stability and vertical motion of air. Horizontal motion of air and water .Pressure gradient forces .viscous forces .Reynold number .Enhance green house effect. Energy balance -a -zero- dimensional Green house model .Global climate models.

Books Recommended:

1.Egbert Booeker &Rienk van Groundelle, Envionmental Physics (John Wiley).
2.J.T.Houghton :The Physics of Atmosphere (Cambridge University Press ,1977).
3. J Twidell and J.weir : Renewable energy sources (ELBS 1988).
4. Sol wieder : An Introduction of Solar energy for Scientists and engineers(John iley 1982)
5. R,N,Keshav murthy and M. Shankar Rao: The Physics of Monsoons (Allied Publishers, 1992)
6. G.J.Haltiner R.T. Williams: Numerical Weather Prediction (John Wiley 1980)

Environmental Physics

Course Outcome:

Co1: To create awareness about the solar & terrestrial radiation & associated environmental changes

Co2: To develop the concepts of weather & climate in relation to near earth & space weather concept.

M.Sc.(Physics) Semester-IV
Choice Based Credit System

Discipline Centric
Elective Paper DCE-8 : **Physics of Nano Mateials**
Paper-XV(IV) Max.Marks. 60
Time Duration - 3 Hours Min. Marks. 21
Instruction to Examiners
Paper shall consist of Two sections A & B. Paper Setter is required to set **ONE** short answer type question from each unit having internal choice in section A. Section B will consist of **FIVE** long answer type questions with **ONE** from each unit and student will answer any **THREE** questions. Each short answer questions shall be of 6 marks and long answer type question shall be of 10 marks.

Unit I

Length scales in Physics, Nanostructures: 1D, 2D and 3D nanostructure (nanodots, thin films, nanowires, nanorods), Band structure and density of states of materials at nanoscale, Size Effects in nano systems, Quantum confinement: Applications of Schrodinger equation – Infinite potential well, potential step potential box, quantum confinement of carries in 3D, 2D, 1D nanostructures and its consequences.

Unit II

Top-down & bottom-up approaches; Formation of nanostructure by ball milling, Chemical Vapor Deposition, Physical Vapor Deposition, Pulsed Laser Ablation technique, Chemical Route of Synthesis: Chemical Precipitation and Co-precipitation, Chemical Bath Depostion, Sol-Gel Synthesis, Micro Emulsion, Solvothermal Synthesis, Spray Pyrolysis and Combustion Technique.

Unit III

X Ray Powder & Single Crystal Diffraction (XRD), X-Ray Fluorescence (XRF), X-Ray Photoelectron Spectroscopy (XPS), Energy Dispersive X-Ray Analysis (EDAX), Nuclear Magnetic Resonance (NMR) & Raman Spectroscopy, Auger Electron Spectroscopy (AES), Differential Scanning Calorimetry (DSC)-Principle of operation, Instrumentation and application of each.

Unit IV

Scanning Tunneling Microscopy (STM), Contact & Non-Contact Atomic Force Microscopy (AFM), Magnetic Force Microscopy (MFM), Scanning Electron Microscopy (SEM), Transmission Electron Microscopy (TEM), Fourier Transform Infrared (FTIR), Spectrophotometer, Photo Luminescence (PL), UV-visible Spectrophotometer, Electron Energy Loss Spectroscopy (EELS), Electron Probe Micro Analyzer (EPMA) – Principle of operation, Instrumentation and application of each.

Unit V

Quantum wells, Wires & Dots, Organic Semiconductors, Molecular Switches, Motor Molecules & Biometric Components, nano Robots and NEMS, Sensors & Actuators, Biomotors, Gas Sensors, Pollution Sensors, Biosensors, CNT based Fluid Velocity Sensors, Nanomaterials in Drug Deliver: Targeting Ligands, Cancer Treatment, nanonephrology, Nanosurgery.

References

1. Nanomaterials: Synthesis, properties, characterization and applications: A.S. Edelstein and R.C. Cammaratra
2. Nanoelectronics and Nanosystems: Karl Goser, Peter Glosekotter, Jan Diensthuhl, Springer, 2004
3. Handbook of Analytical Instruments, R.S. Khandpur
4. Elements of X-ray Diffraction, B.D. Cullity
5. Thermal Methods of Analysis: W.W. Wendlandt
6. Encyclopedia of nanotechnology, H.S. Nalwa
7. Nanomaterial System: Properties & Applications: A.S. Edelstein and R.S. Cammaratra

Physics of Nano Mateials

Course Outcome:

CO1: A student will have clear basic concepts of nano-structured materials.

CO2: It is expected to train the students for synthesis of various nano-materials and various characterization methods.

CO3: Students shall appreciate the importance of nano-materials in various technological application like medical technology in treatment of various diseases.

M.Sc.(Physics) Semester-IV
Choice Based Credit System

Generic
Elective Paper GE-4: **ATMOSPHERIC SCIENCE**
Paper-XVI Max.Marks. 60
Time Duration 3 Hours Min. Marks. 21
Instruction to Examiners

Paper shall consist of Two sections A & B. Paper Setter is required to set **ONE** short answer type question from each unit having internal choice in section A. Section B will consist of **FIVE** long answer type questions with **ONE** from each unit and student will answer any **THREE** questions. Each short answer questions shall be of 6 marks and long answer type question shall be of 10 marks.

Unit I

General features of Earth's atmosphere :
Thermal structure of the Earth's Atmosphere, Ionosphere, Composition of atmosphere, Hydrostatic equation, Potential temperature, Atmospheric. Thermodynamics, Greenhouse effect and effective temperature of Earth, Local winds, monsoons, fogs, clouds, precipitation, Atmospheric boundary layer, Sea breeze and land breeze. Instruments for meteorological observations, including RS/RW, meteorological processes and different systems, fronts, Cyclones and anticyclones, thunderstorms.

Unit II

Atmospheric Dynamics :
Scale analysis, Fundamental forces, Basic conservation laws, The Vectorial form of the momentum equation in rotating coordinate system, scale analysis of equation of motion, Applications of the basic equations, Circulations and vorticity, Atmospheric oscillations, Quasi biennial oscillation, annual and semi-annual oscillations, Mesoscale circulations, The general circulations, Tropical dynamics.

Unit III

Atmospheric Waves :
Surface water waves, wave dispersion, acoustic waves, buoyancy waves, propagation of atmospheric gravity waves (AGWs) in a nonhomogeneous medium, Lamb wave, Rossby waves and its propagation in three dimensions and in shared flow, wave absorption, non-linear consideration.

Unit IV

Atmospheric Radar and Lidar :
Radar equation and return signal, Signal processing and detection, Various type of atmospheric radars, Application of radars to study atmospheric phenomena, Lidar and its applications, Application of Lidar to study atmospheric phenomenon. Data analysis tools and techniques.

Unit V

Atmospheric Aerosols :

Spectral distribution of the solar radiation, Classification and properties of aerosols, Production and removal mechanisms, Concentrations and size distribution, Radiative and health effects, Observational techniques for aerosols, Absorption and scattering of solar radiation, Rayleigh scattering and Mie scattering, Bouguert-Bambert law, Principles of radiometry, Optical phenomena in atmosphere, Aerosol studies using Lidars.

Books Recommended:

1. Fundamental Atmospheric Physics : Murray L Salby; Academic Press, Vol. 61, 1996
2. The Physics of Atmosphere - John T. Houghton; Cambridge University Press. 3rd edition 2002.
3. An Introduction to dynamic meteorology-James R Holton; Academic Press, 2004
4. Radar for meteorological and atmospheric observations - S Fukao and K Hamazu, Springer Japan, 2014

ATMOSPHERIC SCIENCE

Course outcome:

Co1: Students will be able to explain principle, characteristics and applications of different types of Cyclones and anticyclones and thunderstorms.

Co2: Students will be able to explain the instrumentation of Atmospheric Dynamics, waves and applications

Co3: Students will be able to explain different types of Atmospheric Radar and Lidar and Atmospheric Aerosols with their applications

Programme – M.Sc. (Computer Science)

Successful completion of M.Sc. (Computer Science) a student should be able to:

Programme Outcomes

POs.1	To understand both the theoretical and practical concepts of Computer Science.
POs.2	To gain programming skill to provide solutions for real world problems.
POs.3	To gather a better understanding to analyze, design and development of software systems.
POs.4	To build a foundation for academics and research in Computer Science.

Programme Specific Outcomes

PSOs.1	Demonstrate understanding of the principles and concepts of the computer systems to develop efficient computing system.
PSOs.2	Analyze, design, develop, implement and test computer systems for providing solutions for computing problems.
PSOs.3	Enhancing skills and learning new computing technologies for attaining professional excellence and research.
PSOs.4	Design and develop computer programs/computer-based systems in the areas related to algorithms, networking, web design and data analytics of varying complexity.
PSOs.5	Acquaint with the contemporary trends in industrial/research and thereby bring forth novel solutions to existing problems.
PSOs.6	Ethics: Apply ethical principles and commit to professional ethics and responsibilities and norms of the engineering practice.

Course Outcomes

MSCS-101- Discrete Mathematics

COs.1	Analyze Properties of Algebraic Structures Such as Groups, Rings and Fields.
COs.2	Apply the Operations of Sets and use Venn Diagrams to Solve Applied Problems;
COs.3	Use and Analyze Recursive Definitions
COs.4	Understand, Explain and Apply the Basic Principles of Sets and Operations in Sets to Solve the Problems
COs.5	Analyze Modern Problems in Computer Science and solve them Using Graphs and Trees.

MSCS-102- Computer System Architecture

COs.1	Understand and Represent Data in Different Binary Formats
COs.2	Design Simplify and evaluate Boolean Equations and Circuits

COs.3 Explain and Analyse Basic Building Blocks of Digital Electronics and Computer
COs.4 Design and Analyse Simple Combination & Sequential Circuits
COs.5 Analyse the Basic Computer Organisation and Programming
COs.6 Understand the Organisation of I/O Devices and Computer Memory Mapping.

MSCS-103- (A) Data Structure Using-C

COs.1 Explain the Basic Terminology Used in Computer Programming.
COs.2 Explain the Process of Problem Solving Using C Programming Language.
COs.3 Write Compile and Debug Programs in C Language.
COs.4 Analyze and Solve Complex and Real Life Problems by Developing Application Programs using C Programming Language.
COs.5 Understand and explain Basic Data Structures Such as Linked Lists Stacks and Queues Tree and Graph.
COs.6 Select and apply Appropriate Data Structures to define the particular Problem statement.
COs.7 Implement Operations Like Searching/Sorting Insertion and Deletion Traversing on Various Data Structures.
COs.8 Determine and Analyze the Complexity of Given Algorithms

MSCS-103- (B) Web Technology

COs.1 Describe the concepts of WWW including Browser and HTTP Protocol.
COs.2 ListtheVariousHTMLTagsandusethemtodeveloptheUserFriendlyWebPages.
COs.3 Define the CSS with its Types and use them to provide the Styles to the Web Pages at Various Levels.
COs.4 DeveloptheModernWebPagesusingtheHTMLandCSSFeatureswithdifferentlayouts as per Need of Applications.
COs.5 Use the Java script to develop the dynamic WebPages.
COs.6 Use Server Side Scripting with PHP to Generate the Web Pages dynamically using the Database Connectivity.
COs.7 Develop the Modern Web Applications using the Client and Server Side Technologies and the Web Design Fundamentals.

MSCS-104-(A) Numerical Methods

COs.1 Understand and analyze the real problems and formulate them into linear and non-linear Equations.
COs.2 Gain the knowledge of various Optimization Techniques for finding the solutions of Non-Linear and Linear Equations.
COs.3 Optimize the solutions by iteratively carrying out Error Analysis for Arithmetic Operations.

COs.4 Understand and explain the Propagation of Errors with the help of Complex Numerical Algorithms.

COs.5 Understand the usage of Interpolation techniques for Numerical Differentiation and Integration.

MSCS- 104-(B) E-Commerce and E- Governance

COs.1 Explain and demonstrate E-Governance Initiatives at the National Level in India

COs.2 Make Classification of E-Commerce and E- Governance

COs.3 Students Able to Think Critically and Analytically to New Successful Business Ideas.

MSCS-105- DBMS (Database Management System)

COs.1 Understand and describe the basic concepts and terminology of Database Management System.

COs.2 Analyze and Design the database of applications using ER modelling and Normalization.

COs.3 Demonstrate the database schema data modelling and normalization process with the help of example.

COs.4 Implement the database design using appropriate database tools.

COs.5 Describe the transaction processing system locking techniques and data recovery.

MSCS-201- System Software

COs.1 Understand different components of system software.

COs.2 Understand intermediate code generation in context of language designing.

COs.3 Recognize operating system functions such as memory management as pertaining to run time storage management.

MSCS-202- Software Engineering

COs.1 Identify Analyze Review and Validate the Requirement of Software Components and System and Also Prepare Software Requirement Specification (SRS) Document Using Relevant Standards Tools and Methodologies.

COs.2 Manage a Software Project by Applying Project Management Concepts Such as Planning

COs.3 Scheduling and Risk Management for Developing Qualitative and Economic Software.

COs.4 Work Effectively in Various Profiles of Software Developing Team Such as Software Analyst

COs.5 Architecture Programmer Tester Quality Assurance and Control officer Project Manager and Leaders.

COs.6 Communicate and Coordinate Competently by Listening Speaking Reading and Writing Software Documents

COs.7 Apply Coding Standards & Guidelines and Quality Norms in Coding of Software Systems to Satisfy the Requirements and Quality.

COs.8 Design Test Cases and Optimize the Test Suite for Unit Integration and System-Level Testing Using Various Techniques and Tools for Adequately Testing the Software Components and Systems.

MSCS-203- (A) Object Oriented Programming

COs.1 Explain Concepts and Advantages of Object Oriented Programming.

COs.2 Apply and implement the concepts of the Object-Oriented paradigms to analyze design and develop the solutions of real world problems using the Principles of information Hiding Localization and Modularity.

COs.3 Design Develop and maintain the small applications system utility for societal and academic problems using reusability concepts in team spirit.

COs.4 Demonstrate the Advanced Features of C++ Specifically Stream I/O Templates and Operator Over loading and Overriding.

MSCS-203- (B) Programming in Python

COs.1 Install and use Python on Various Platform.

COs.2 Understand and Explain the features of Python language

COs.3 Design and Develop Python applications for data analysis using object-oriented concept.

COs.4 Build package and modules in Python with reusability and exception Aspect

COs.5 Write programs for Reading and Writing files in Python.

MSCS- 204-(A) Computer Network

COs.1 Demonstrate the Basic Concepts of Networking Principles Routing Algorithms, IP Addressing and Working of Networking Devices.

COs.2 Demonstrate the Significance Purpose and application of Networking Protocols and Standards.

COs.3 Describe compare and contrast LAN WAN MAN Intranet Internet AM FM PM and Various Switching Techniques.

COs.4 Explain the working of Layers and apply the various protocols of OSI & TCP/IP model.

COs.5 Analyze the Requirements for a Given Organizational Structure and Select the Most Appropriate Networking Architecture and Technologies.

COs.6 Design the Network Diagram and Solve the Networking Problems of the Organizations with Consideration of Human and Environment.

COs.7 Install and Configure the Networking Devices.

MSCS- 204-(B) Big Data Analysis

COs.1 Ability to identify the characteristics of datasets and compare the trivial data and big data for various applications.
COs.2 Demonstrate an ability to use Hadoop framework to efficiently store retrieve and process Big Data for Analytics.
COs.3 Implement several Data Intensive tasks using the Map Reduce Paradigm

MSCS-205- Advanced Programming Language

COs.1 Understand and explore various Features of .Net Framework
COs.2 Analyze, Design and Develop the GUI based Applications software using Vb.Net and C#
COs.3 Design, Develop and Implement Complete software Projects using Vb.Net and C# with consideration of Environment in team spirit.
COs.4 Analyze the requirement, design and develop Dynamic and Static Websites and Web applications using .Net technology.
COs.5 Integrate and Apply Different Components Including Database, XML with Proper Choice of Languages Mapping

MSCS-301- Operating System

COs.1 Identify and describe the Services Provided by Operating Systems.
COs.2 Understand and Solve the Problems Involving Process Control Mutual Exclusion
COs.3 Synchronization and Deadlock.
COs.4 Apply Various Approaches of Memory Management
COs.5 Analyze Various Operating System Approaches in Linux and Windows

MSCS-302- Computer Graphics & Multimedia

COs.1 Student will be able to implement the basic concepts and learn the various algorithms to scan, convert the basic geometrical primitives, transformations, area filling, clipping, viewing,
COs.2 Develop Understanding of Technical Aspect of Multimedia Systems. Also To Understand and explain the storage mechanism and applicability of Various File Formats for Audio Video and Text Media.
COs.3 Develop the Various Multimedia Systems Applicable in Real Time.
COs.4 Create a Multimedia Component Using Various Tools and Techniques.
COs.5 Apply the Guidelines and Standards of Multimedia Systems and to analyze the performance of Multimedia System.

MSCS-303- (A) Theory of Computation

COs.1 The student will be able to analyze and compare different computational models.

COs.2 Demonstrates Models, Turing Machine, Regular Expression, Push down Automaton.
COs.3 Apply and Prove properties of Languages, Grammars and Automata.
COs.4 Apply Knowledge of Computing and Mathematics to Solve Problem
COs.5 Apply Mathematical Foundations, Algorithmic Principles and Computer Science Theory to the Modelling.
COs.6 To identify the limitations of some computational models and possible methods of proving them.

MSCS-303- (B) AI & Machine Learning

COs.1 Demonstrate and Apply Artificial Intelligence Techniques, Various Types of Production Systems, and Characteristics of Production Systems.
COs.2 Design Neural Networks Architecture and Implement Functions and Various Algorithms Involved.
COs.3 Fuzzy Logic, Various Fuzzy Systems and their Functions.
COs.4 Genetic Algorithms, its Applications and Advances
COs.5 Able to Analyse and Design Expert Systems through Learning the Machine

MSCS-304-(A) Advanced Computer architecture

COs.1 Understand different processor architectures and system-level design processes.
COs.2 Understand the principles of I/O in computer systems, including viable mechanisms for I/O and secondary storage organization.
COs.3 Understand different processor architectures and system-level design processes

MSCS-304-(B) Information & Network Security

COs.1 Explain the Principles of Cryptography and Cryptanalysis Including Symmetric and Asymmetric Encryption, Hashing, and Digital Signatures.
COs.2 Explain the Fundamental Notions of Threat, Vulnerability, Attack and Countermeasure.
COs.3 Be able to Identify the Security Goals of an Information System, Point Out Contradictory Goals and Suggest Compromises.
COs.4 Identify and Classify Particular Examples of Attacks.
COs.5 Implement the Various Security Algorithms.

MSCS-305- Java Programming

COs.1 Explain and apply the Object Oriented Concepts for Solving Real Problem.
COs.2 Use the Java SDK Environment to Create Debug and Run Simple Java Programs.
COs.3 Apply Java Technology to Develop the Small Applications Utilities and Web Applications.

COs.4	Apply Event Management and Layout Managers Using AWT Swing JDBC and Servlet for Developing the Software for Various Problems.

MSCS-401-Major Project/Dissertation External Evaluation

COs.1	Identify the problem by applying acquired knowledge.
COs.2	Analyze and categorize executable project modules after considering risks.

MSCS-402-Major Project/Dissertation Internal Evaluation

COs.1	Choose efficient tools for designing project modules.
COs.2	Combine all the modules through effective team work after efficient testing.
COs.3	Elaborate the completed task and compile the project report.

AWADHESH PRATAP SINGH UNIVERSITY

REWA (M.P.) 486003

CBCS

CURRICULAM & SYLLABUS

MASTER OF COMPUTER SCIENCE (M.Sc.)

(UGC Approved)

Course Code: 08

www.apsurewa.ac.in

Approved by Board of studies dated 21-09-2020

DEPARTMENT OF COMPUTER SCIENCE A.P.S. UNIVERSITY, REWA (M.P.)
SYLLABUS FOR M.SC. COMPUTER SCIENCE
(w.e.f. SESSION 2020-2021)

Semester I

Paper Code	Subject Code	Subject Name	Course Type	Credits	Theory Marks	Internal Marks	Practical Marks	Total Marks
1081	MSCS-101	Discrete Mathematics	CC	4	60	40	0	100
1082	MSCS-102	Computer System Architecture	CC	4	60	40	0	100
10831 10832	MSCS-103	**Elective I:: (Any one of the following considering departmental constraints)** a) Data Structure Using C b) Web Technology	DCE	4	60	40	0	100
10841 10842	MSCS-104	**Elective II:: (Any one of the following considering departmental constraints)** a) Numerical Methods b) E-Commerce and E-Governance	DCE	4	60	40	0	100
1085	MSCS-105	DBMS *	GE	4	60	40	0	100
1086	MSCS-106	S/W Lab-I MSCS 102 & 103	LAB	2	0	40	60	100
1087	MSCS-107	S/W Lab-II MSCS104 & 105	LAB	2		40	60	100
1088	MSCS-108	Comprehensive Viva	VIVA	4				100
		Semester Total Marks and Credits		**28**				**800**

Semester II

Paper Code	Subject Code	Subject Name	Course Type	Credits	Theory Marks	Internal Marks	Practical Marks	Total Marks
2081	MSCS-201	System Software	CC	4	60	40	0	100
2082	MSCS-202	Software Engineering	CC	4	60	40	0	100
20831 20832	MSCS-203	**Elective III:: (Any one of the following considering departmental constraints)** a) Object Oriented Programming b) Programming in Python	DCE	4	60	40	0	100
20841 20842	MSCS-204	**Elective VI:: (Any one of the following considering departmental constraints)** a) Computer Network b) Big Data Analysis	DCE	4	60	40	0	100
2085	MSCS-205	Advanced Programming Language *	GE	4	60	40	0	100
2086	MSCS-206	S/W Lab-I MSCS 203	LAB	2		60	40	100
2087	MSCS-207	S/W Lab-I MSCS 205	LAB	2		60	40	100
2088	MSCS-208	Comprehensive Viva	VIVA	4				100
		Semester Total Credits and Marks		**28**				**800**

CC: Core Course GE: Generic Elective DCE: Discipline Centric Elective

* Student may choose this course as a Generic Elective or may choose a Generic Elective Course Offered in other UTDs at the same level or may choose a course offered by MOOCs through SWAYAM

Instructions:
1. For passing the subject examination minimum 40% marks must be separately scored in Theory Paper, Practical Exams and Internal Evaluation for the subject.
2. Please refer concerned regulation for details

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Semester III

Paper Code	Subject Code	Subject Name	Course Type	Credits	Theory Marks	Internal Marks	Practical Marks	Total Marks
3081	MSCS-301	Operating System	CC	4	60	40	0	100
3082	MSCS-302	Computer Graphics & Multimedia	CC	4	60	40	0	100
30831 30832	MSCS-303	**Elective V:: (Any one of the following considering departmental constraints)** a) Theory of Computation b) AI & Machine Learning	DCE	4	60	40	0	100
30841 30842	MSCS-304	**Elective VI:: (Any one of the following considering departmental constraints)** a) Advanced Computer Architecture b) Information & Network Security	DCE	4	60	40	0	100
3085	MSCS-305	Java Programming*	GE	4	60	40	0	100
3086	MSCS-306	S/W Lab-I MSCS 302	LAB	2		60	40	100
3087	MSCS-307	S/W Lab-I MSCS 305	LAB	2		60	40	100
3088	MSCS-308	Comprehensive Viva	VIVA	4				100
		Semester Total Credits and Marks		**28**				**800**

Semester IV

Paper Code	Subject Code	Subject Name	Course Type	Credits	Theory Marks	Internal Marks	Practical Marks	Total Marks
4081	MSCS401	Major Project/ Dissertation External Evaluation	CC	12				300
4082	MSCS402	Major Project/ Dissertation Internal Evaluation	CC	8				200
4083	MSCS403	Comprehensive Viva	Viva	4				100
		Total		**24**				**600**

CC: Core Course GE: Generic Elective DCE: Discipline Centric Elective

* Student may choose this course as a Generic Elective or may choose a Generic Elective Course Offered in other UTDs at the same level or may choose a course offered by MOOCs through SWAYAM

Instructions:

1. For passing the subject examination minimum 40% marks must be separately scored in Theory Paper, Practical Exams and Internal Evaluation for the subject.
2. For passing the semester, minimum aggregate marks must be 45% in the semester.

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DEPARTMENT OF COMPUTER SCIENCE A.P.S. UNIVERSITY, REWA (M.P.)
SYLLABUS FOR M.SC. COMPUTER SCIENCE
(SESSION 2020-2021)

PAPER (MCS-101) - DISCRETE MATHEMATICS

Course Objectives:

- Understand Different Types of Discrete Structures
- Express a Logic Sentence in Terms of Predicates, Quantifiers, and Logical Connectives
- Solve Problems Using the Principle of Inclusion-Exclusion.
- Understand Recursive Definitions;
- Understanding the computer problems by graph and trees concept.

Course Outcomes:

- Analyze Properties of Algebraic Structures Such as Groups, Rings and Fields.
- Apply the Operations of Sets and use Venn Diagrams to Solve Applied Problems;
- Use and Analyze Recursive Definitions
- Understand, Explain and Apply the Basic Principles of Sets and Operations in Sets to Solve the Problems
- Analyze Modern Problems in Computer Science and solve them Using Graphs and Trees.

Unit-wise Syllabus:

UNIT I

Mathematical Logic and Set theory: Introduction. The theory of Inference for the Statement Calculus, The Predicate Calculus, Inference Theory of the predicate Calculus. Set Theory. Introduction, Basic Concepts of Set Theory, Elementary representation of Discrete Structures: Relations and Ordering: Properties of Binary Relations in a set, Relation Matrix and the Graph of a Relation, Composition of Binary Relation, Partial Ordering, Functions: Composition, Characteristics, Natural Number.

UNIT II

Algebraic Structures: Introduction: Algebraic Systems: Examples and General Properties: Definition and Examples, Some Simple Algebraic Systems and General Properties, Semi groups and Monoids: Definition and Examples, Homomorphism of Semi group and Monoids, Sub semi groups and Sub Monoids, Grammars and languages: Discussion of Grammars, Formal Definition of a Language, Nations of Syntax Analysis Polish Expressions and Their Compilation, Groups: Definitions and Examples. Subgroups and Homomorphism. Co-sets and Lagrange's Theorem, Normal subgroups, Algebraic Systems with Two Binary Operations,

UNIT-III

Lattices and Boolean algebra: Introduction: Lattices as Partially Ordered Sets: Definition and Example. Some Properties of Lattices, Lattices as Algebraic Systems. Sub lattices, Direct Product and Homomorphism, Some Special Lattices, Boolean algebra, Definition and Examples, Subalgebra, Direct Product and Homomorphism Boolean Functions Boolean Forms and Free Boolean Algebra, Values of Boolean Expressions and Boolean Functions, Representation of Boolean Functions, Minimization of Boolean Function, Design Examples Using Boolean Algebra.

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UNIT -IV

Graph Theory: Introduction Basic Concepts of Graph Theory: Basic Definitions, paths, Reachability and Connectedness, Tree and fundamental Circuits: Some Properties of Trees, Pendent Vertices in a tree, Distance and Centers in a tree, Rooted and Binary Trees, Spanning tree, Fundamental Circuits. Matrix Representation of Graphs: Incidence Matrix, Circuit Matrix, An application to a Switching network, path Matrix and Adjacency Matrix

Text-Books;

1. Trembley J.P. & Manohar R: Discrete Mathematical Structure with Application to Computer Science, TMH
2. S Lipchutz: "Finite Mathematics", Schaum Series, MGH.

Reference Books:

1. C.L Liu- Elements of Discrete Mathematics- McGraw Hill.
2. K.H. Rosen, Discrete Mathematics and Applications, Fifth Edition 2003, Tatamcgraw Hill.
3. W.K. Grassmann and J.P. Trembnlay, Logic and Discrete Mathematics, a Computer Science
4. Ronald Graham, Donald Knuth and Oren Patashik- Concrete Mathematics: a Foundation for Computer Science Ronald Graham,
5. Donald Knuth and Oren Patashik- Concrete Mathematics: a Foundation for Computer Science-Addison-Wesley
6. Judith L. Gersting -Mathematical Structures for Computer Science,-Computer Science Press.
7. K. a. Ross, Ch. R. B. Wright, Discrete Mathematics, Prentice Hall Inc., 1992 (Or Pwn Warszawa 1996).

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(SESSION 2020-2021)

Paper (MSCS-102) Computer System Architecture

Course Objectives:

- Understand Data Representation for Digital Logic
- Understand the Basic Blocks of Digital Logic.
- Understand the Fundamental Organization of a Digital Computer
- Design Simple Combination & Sequential Circuits
- Examine the Basics of General Programming
- Learn the Micro programmed Controls
- Learn the Memory and I/O Organization.

Course Outcomes:

- Understand and Represent Data in Different Binary Formats
- Design Simplify and evaluate Boolean Equations and Circuits
- Explain and Analyse Basic Building Blocks of Digital Electronics and Computer
- Design and Analyse Simple Combination & Sequential Circuits
- Analyse the Basic Computer Organisation and Programming
- Understand the Organisation of I/O Devices and Computer Memory Mapping.

Unit-wise Syllabus:

UNIT I

Basic Computer Organization: Block diagram, Evolution of computers Systems. Classification of computers Data representation in computers, Binary. Octal and Hexadecimal numbering systems and their inter conversion, Binary codes -BCD. EBCDIC Gray. Parity, Error correction code. Concepts of Boolean algebra: Basic Postulates. Canonical from Minimization Techniques, Karnaugh Map. Logic gets. Flip-Flops (RS, D, JK, T)'

UNIT-II

Basic Building Blocks of Computers: Registers (Shift Register), Counters (Binary, Up, Down, Ripple, Register transfer, Bus and Memory transfer, Arithmetic, shift and logic Micro-operations, CPU introduction, general register organization, addressing modes, Memory organization - Memory hierarchy, Main memory, Auxiliary memory. Associative memory. Cache memory, Virtual memory, Data transfer Modes of transfer. Asynchronous and Synchronous Data transfer. DMA

UNIT-III

Internal architecture of 8086/8088 Microprocessor: Software model of 8086/88. Memory Address Space and Data Organization, Data type, Segment registers and Memory Segmentation. Instruction pointer, Data registers , Pointer and Index registers, Status register, The Stack, I/O Address Space, Addressing modes of the 8086/88. Converting Assembly Language instructions to Machine Code, The IBM PC and its DEBUG program.

UNIT -IV

Introduction to 8086/88 Programming: The instruction set of the 8086/88. Data transfer, Arithmetic, Logic, Shift and Rotate Instructions, Flag Control instructions. Compare instruction, Jump Instructions.

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Subroutines and subroutine handling instruction. The loop and loop-handling instructions. Strings and String handling instructions. Interrupts in 8086. Introduction to DOS/BIOS interrupt programming

Text Books:

1. M. Moris Manno: Computer System Architecture, PHI
2. Walter A. Trieble and Abtar Singh: 8088 and 8086 microprocessors: Programming, interfacing software, hardware and applications PHI

Reference Books:

1. John P. Hayes: Computer Architecture and Organization' MGH
2. Andrew S. Tannenbaum: StructuredcomputerOrganization' PHI
3. Albert Paul Malvión: Digitalprinciples T'MH
4. B Ram. Microprocessor & Microcomputer dhanpat Rai& Sons

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DEPARTMENT OF COMPUTER SCIENCE A.P.S. UNIVERSITY, REWA (M.P.)
SYLLABUS FOR M.SC. COMPUTER SCIENCE
(SESSION 2020-2021)

PAPER (MSCS-103 A) DATA STRUCTURE USING C

Course Objectives:

- To Make the Student Learn a C Programming Language.
- To Learn Problem Solving Techniques using C.
- To Teach the Student to Write Programs in C and to Solve the Problems.
- To Teach the Concepts of C Programming Like Control Structures Functions Learn About arrays Structures and Union etc.
- Learn Basic Data Structures Such as Linked Lists Stacks and Queues Tree and Graph.
- Learn Algorithm for Solving Problems Like Sorting Searching Insertion and Deletion of Data
- Understand the Complexity of Various Algorithms.
- Introduce Various Techniques for Representation of the Data in in Memory.

Course Outcomes:

- Explain the Basic Terminology Used in Computer Programming.
- Explain the Process of Problem Solving Using C Programming Language.
- Write Compile and Debug Programs in C Language.
- Analyze and Solve Complex and Real Life Problems by Developing Application Programs using C Programming Language.
- Understand and explain Basic Data Structures Such as Linked Lists Stacks and Queues Tree and Graph.
- Select and apply Appropriate Data Structures to define the particular Problem statement.
- Implement Operations Like Searching/Sorting Insertion and Deletion Traversing on Various Data Structures.
- Determine and Analyze the Complexity of Given Algorithms

Unit-wise Syllabus:

UNIT-I

Programming Part I: Basics of C programming, Structure of a simple C program. Simple I/O functions, Data types in C, operators &their precedence, Control Structures if-else statements. Switch statement, Loops while. do-while and for loop functions: User-defined functions, returning a value from a function. Local and global variables, automatic, Static Register and External Storage class Parameters: Type, Declarations of a function, functions with more than one parameters, recursion, Arrays: arrays (upto 2 Dimensions), Declaration and initialization, the break structured, string and character arrays. operations on arrays, The C preprocessors.

UNIT- II

Programming Part II: String and string functions Pointers, the concept of pointers, the address and correction operators, passing pointers as parameters. Dynamic memory allocation, Arrays and pointers, Passing by value and reference, Address arithmetic Pointer to pointers, Structures: initializing a structure, Types of structures. arrays within structures, structures within structures. Structures and functions. Files

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in C, modes for files. functions used infiles (putchar, getchar, getc, putc. fopen, fclose, fscan, fprint, fseek. ftell. fread and (write), error handling in files.

UNIT- III

Data Structure part I: Introduction: Algorithm analysis for time and space requirements, stacks; operations on stacks applications of stacks, recursion, polish expressions and their manipulations, Queue; operations on queues, priority queues, linked storage representation, linked linear lists. Operations on linked list, circular linked list, doubly linked lists. Application of linked lists, Polynomial manipulation, error precision. fixed block storage allocation, dynamic storage management, first fit and best fit, storage allocation, garbage collection, compaction.

UNIT- IV

Data Structure part II : Definitions and concepts of general trees and binary trees, representation of binary tree. representation of general tree, binary tree traversal. binary trees. operation on binary trees. application of trees, manipulation of arithmetic's, expressions, binary search trees. evaluation of binary search trees. Graphs and their representation, matrix representation, list structure Breadth first search, Depth first search, spanning trees. application of graphs, topological sorting. sorting techniques selection sort. bubble sort, merge sort, tree sort, partition exchange sort. radix sort. heap sort ,searching techniques: Linear search. binary search. hash table method, hashing function .

Text Books:

1. Gotrified Programuning with C
2. E Balagurusamy: Programuning with C
3. Horowitz &Sahni: Fundamentals of Data Structures, Comp. Sc. Press
4. Tanenbaum A.S.: Data Structures using C, PHI

Reference books

1. Rajaraman Introduction to C. PHI
2. Y Kanetkar Let us C, BPB
3. S. Lipschutz Schaum s outline series. Data Structures. MGH
4. J.P Trembley &P.G. Slorenson: An Introduction to Data Structures, MGH
5. OE Knuth. The Art of Computer Programming, Addision Wesley R C: Dromey- How to solve it by computer

DEPARTMENT OF COMPUTER SCIENCE A.P.S. UNIVERSITY, REWA (M.P.)
SYLLABUS FOR M.SC. COMPUTER SCIENCE
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PAPER (MSCS-103 B) WEB TECHNOLOGY

Course Objectives:

- Learn How to Design and Develop a Web Page Using HTML and CSS
- Learn How to Link Pages So that they Create a Web Site.
- Design and Develop a Web Site Using Text Images Links Lists and Tables for Navigation and Layout.
- Style Your Page Using CSS Internal Style Sheets and External Style Sheets.
- Learn to use Java Script & XML in Web Design.
- Learn How to use Database in Web Design.

Course Outcome:

- Describe the concepts of WWW including Browser and HTTP Protocol.
- ListtheVariousHTMLTagsandusethemtodeveloptheUserFriendlyWebPages.
- Define the CSS with its Types and use them to provide the Styles to the Web Pages at Various Levels.
- DeveloptheModernWebPagesusingtheHTMLandCSSFeatureswithdifferentlayoutsas per Need of Applications.
- Use the Java script to develop the dynamic WebPages.
- Use Server Side Scripting with PHP to Generate the Web Pages dynamically using the Database Connectivity.
- Develop the Modern Web Applications using the Client and Server Side Technologies and the Web Design Fundamentals.

Unit-wise Syllabus :

UNIT-I

Introduction to Web Web Designing and Website Planning :concept of WWW Internet and WWW HTTP Protocol : Request and Response Web Browser and Web Servers Website Hosting-Free Vs. Paid Linux Vs. Windows Hosting Concepts & use of Database & Mail Servers Associated with Web Sites Features of Web 2.0 Concepts of Effective Web Design Web Design Issues Including Browser Bandwidth and Cache Display Resolution Look and Feel of the Website Page Layout and Linking User Centric Design Sitemap Planning and Publishing Website Designing Effective Navigation. Website Hosting Issues C panel and FTP.

UNIT-II

Web Development with HTML : Basics of HTML Formatting and Fonts Commenting Code Color Hyperlink Lists Tables Images Forms Meta Tags Character Entities Frames and Frame Sets Browser Architecture and Web Site Structure. Overview and Features of HTML5 use of HTML Code Editor& WYSIWYG Editor. Cascading Style Sheets (CSS): Style Sheets : Need for CSS Introduction to CSS Basic Syntax and Structure Using CSS Background Images Colors and Properties Manipulating Texts Using Fonts Borders and Boxes Margins Padding Lists Positioning Using CSS CSS2 Overview and Features of CSS3

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UNIT-III

Technologies for Web Applications Javascript & XML: Javascript : Client Side Scripting with Javascript Variables Functions Conditions Loops and Repetition Pop Up Boxes Advance Javascript: Javascript and Objects Javascript Own Objects the Dom and Web Browser Environments Manipulation Using Dom Forms and Validations DHTML : Combining HTML, CSS and Javascript Events and Buttons. XML : Introduction of XML Validation of XML Documents DTD Ways to use XML, XML for Data Files Html Vs XML Embedding XML into HTML Documents Converting XML to HTML for Display Displaying XML Using CSS and XSL Rewriting HTML as XML Relationship Between HTML SGML and XML Web Personalization Semantic Web Semantic Web Services. Transforming XML Using XSL and XSLT

UNIT-IV

Web Design with PHP: Introduction and Basic Syntax of PHP Decision and Looping with Examples PHP and HTML Arrays Functions Browser Control and Detection String Form Processing Files Advance Features: Cookies and Sessions Object Oriented Programming with PHP. Introduction to Database Driven Websites with PHP: PHP and MYSQL: Basic Commands with PHP Examples Connection to Server Creating Database Selecting a Database Listing Database Listing Table Names Creating a Table Inserting Data Altering Tables Queries Deleting Database Deleting Data and Tables PHP My admin and Database Bugs.

Reference Books:

1. Roger S. Pressman David Lowe "Web Engineering" Tata McGraw Hill Publication 2007
2. Achyut S Godbole and Atul Kahate "Web Technologies" Tata McGraw Hill
3. Gopalan N P Akilandeswari "Web Technology: a Developer S Perspective" PHI
4. Chris Bates Web Programming: Building Internet Applications Wiley
5. C. Xavier "Web Technology & Design" Tata McGraw Hill.
6. Ivan Bay Ross "HTML DHTML Java Script Perl CGI" BPB.
7. Ralph Moseley and M.T. Savaliya- Developing Web Applications Wiley-India
8. Web Technologies Black Book Dreamtech Press
9. HTML5 Black Book Dreamtech Press
10. Joel Sklar- Web Design Cengage Learning
11. Harwani- Developing Web Applications in PHP and Ajax Mcgrawhill
12. P.J. Deitel & H.M. Deitel- Internet and WorldWideWeb How to Program Pearson

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PAPER (MCS-104 A) – NUMERICAL METHODS

Course Objectives:

- To Make the Student's Aware of Need of Numerical Methods.
- Cover the Classical Fundamental Topics in Numerical Methods: Approximation Numerical.
- Integration Numerical Linear Algebra Solution of Nonlinear Algebraic Systems and Solution of Ordinary Differential Equations.
- To Make Students Aware of Numerical Analysis Software and Computer Facilities.

Course Outcomes:

- Understand and analyze the real problems and formulate them into linear and non-linear Equations.
- Gain the knowledge of various Optimization Techniques for finding the solutions of Non-Linear and Linear Equations.
- Optimize the solutions by iteratively carrying out Error Analysis for Arithmetic Operations.
- Understand and explain the Propagation of Errors with the help of Complex Numerical
- Algorithms.
- Understand the usage of Interpolation techniques for Numerical Differentiation and
- Integration.

Unit-wise Syllabus:

UNIT-I

Statistical Methods: Introduction, Sampling, Frequency Distribution, Measures of central tendency, Measures of dispersion, discrete probability distribution: Significance of probability, Discrete, Binomial, Poisson and Normal Distribution, Curve fitting, Regression & Correlation: Linear least square fit, Nonlinear fit, Polynomial fit, coefficient of correlation, multiple, partial & rank Correlation. Tests of significance: chi square, T-test & f-Test

UNIT -II

Numerical methods 1: Solution of polynomial and Linear Equations: Introduction properties & Evaluation of polynomial Equation, Iterative methods for roots of Equations Bisection method. False position method , Newton- Raphson method for complex root, rate of Convergence , Muller method, fixed point method, Solution of simultaneous equation solution by notation method. Gauss elimination method pivotal Condensation, Gauss Seidel Method, Gauss Jordan method Matrix Method Gauss Jordan Matrix Inversion, Eigen Value & Eigen Vectors

UNIT -III

Numerical methods 2; Interpolation & Numerical Differentiation: Introduction, Linear interpolation, polynomial interpolation, difference Table, Gregory- Newton interpolation, Newton divided difference interpolation, Lagrange's interpolation (Backward and Forward) Errors in differences Hermite interpolation, Piecewise and spline interpolation Numerical differentiation by polynomial fit, higher order derivatives, Errors in Numerical differentiation

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UNIT -IV

Numerical Methods3: Numerical Integration & Solution of Differential Equation: Numerical integration Introduction , Trapezoidal rule, Simpson's 1/3 rule, Newton's three eighth rule, Guassion Quadrature , Solution by Euler's method, Taylor series, Predictor- corrector method, Runge-Kutta method, Numerical solution of partial differential equation, parabolic partial differential equation, Elliptical differential equation, Laplace equation, Poisson equation , iterative methods.

Text Books

1. E. Balaguruswamy Computer Oriented Statistical & Numerical methods, Macmillan
2. E.V.Krishnamurthy: Numerical algorithms, computations in Sc, and Engg., Addison Wesley Publishing Company

Reference Books

1. Jain M.K, Lyengar S.R.K. &Jain R.K. Numerical Methods for Scientific & Engineering Computation EWP
1. 2.Desai. Fortran Programming & Numerical Methods. EWP

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PAPER (MCS-104 B) – E-COMMERCE AND E-GOVERNANCE

Course Objectives:

- To Develop Skills in Understanding Strategic Issues Related to E- Commerce and E- Governance
- To Develop a Broad Knowledge of E-Governance and E-Commerce Activities in India
- To Understand the Electronic Payment Systems
- To Develop Knowledge of How the Government May Contribute in Moving the Country Towards E-Commerce and E- Governance

Course Outcome:

- Explain and demonstrate E-Governance Initiatives at the National Level in India
- Make Classification of E-Commerce and E- Governance
- Students Able to Think Critically and Analytically to New Successful Business Ideas.

Unit-wise Syllabus :

UNIT-I

Introduction to E-Commerce: Definition, History of E-Commerce, E-Business Models B2B, B2C, C2C, C2B, Environment of E-Commerce, Dimensions of E-Commerce, Ethical Issues, Electronic Data Interchange, Value Chain and Supply Chain, E-Commerce Marketing, E-Commerce Strategy, E-Commerce Infrastructure, Advantages and Disadvantages of E-Commerce.

UNIT- II

Electronic Payment Systems: Payment Gateways, Payment Cards, Credit Cards, Debit Cards, Smart Cards, E-Credit Accounts, E-Money, Marketing on the Web, Categories of E-Commerce, Edt, Marketing Strategies, Advertising on the Web, Customer Service and Support, Internet Banking, Introduction to M-Commerce, Case Study: E-Commerce in Passenger Air Transport, Element of E-Commerce, Issues of E-Commerce

UNIT- III

E-Government, Theoretical Background of E-Governance, Issues in E -Governance Applications, Evolution of E-Governance, its Scope and Content, Benefits and Reasons for the Introduction of E-Governance, E-Governance Models - Broadcasting, Critical Flow, Comparative Analysis, Mobilization and Lobbying, Interactive Services / G2C,C2G

UNIT- IV

E-Readiness, E-Government Readiness, E- Framework, Step & Issues, Application of Data Warehousing and Data Mining in E-Government, Case Studies: NICNET-Role of Nationwide Networking in E-Governance, E-Seva, Origins in India E-Governance Projects in India Measures to Be Considered Before Going for E-Governance, Work plan and Infrastructure E-Government Systems Security: Challenges and Approach to Security of E-Government, Security Concern in E-

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Commerce, Security for Server Computers, Communication Channel Security, Security for Client Computers, E-Security Network and Web Site Risk for E-Business, Information Technology ACT 2000 and its Highlights Related to E-Commerce, E-Security, Firewalls, Electronic Market / E- Shop, Introduction to Security, Types of Securities, Security Tools, Network Security.

Text Books

1. Gary P. Schneider, "E-Commerce", Cengage Learning India.
2. C.S.R. Prabhu, "E-Governence: Concept and Case Study", PHI Learning Private Limited.
3. P. Tjoseph, S.J.,"E-Commerce an Indian Perspective", Prentice-Hall of India.
4. V. Rajaraamn, "Essentials of E-Commerce Technology", PHI Learning Private Limited.
5. Amir Manzoor " E-Commerce: an Introduction", Lambert.

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PAPER (MCS-105) – DBMS (DATA BASE MANAGEMENT SYSTEMS)

Course Objectives:

- Understand the Fundamentals of Data Models and Conceptualize a Database System Using ER Diagram.
- Make a Study of Relational Database Design.
- Know About Data Storage Techniques and Query Processing.
- Impart Knowledge in Transaction Processing Concurrency Control Techniques and Recovery Procedures.
- To Understand MySQL Database Management System.

Course Outcome:

- Understand and describe the basic concepts and terminology of Database Management
- System.
- Analyze and Design the database of applications using ER modeling and Normalization.
- Demonstrate the database schema data modeling and normalization process with the help of example.
- Implement the database design using appropriate database tools.
- Describe the transaction processing system locking techniques and data recovery.

Unit-wise Syllabus:

UNIT -I

Basic Concept: An Introduction to database System, Basic Data System Terminology, Purpose of DBMS, Data Independence, An Architecture of DBMS: Schema, Subschema, Mapping , Physical & Logical Data, Basic File System, File Organization: Sequential, Index Sequential, Hosting, B- Tree based index. File Organization based on Dynamic Hashing with immediate splitting, Model of Real Word, Details of E-R Model.

UNIT -II

Three Data Models: An Overview of three Main Data Models:Hierarchical Model. Network Model, Relational Model and their inter comparison Concept of Relational Algebra: Basic Operation like Union, Intersection, and Difference. Product join, The relational Calculus: Domain & Tuple Calculus, relational Database Design: Integrity Constraints, Functional Dependency Single Value and Multi Value Functional dependency. Normal Forms: 1, 2, 3 Boycee Codd, & 4 Normal forms: Join Dependency.

UNIT -III

Query Processing & Database Software: Query Interpretation, Equivalence of Expression, Estimation of Query Processing Cost. Query Optimization by Algebraic Manipulation, Join Algorithms, Types of Data Base Languages. Procedural and Non- procedural Language, Relational Commercial Query Languages, QBE, SQL: Introduction , Basic Structure, the Power of SQL (Creation, Insertion, Deletion, Indexing & Modification of Database in SQL), query optimization strategies

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UNIT -IV

Management Considerations & Future Trends: Security & Integrity: Introduction, Access Control, Crypto Systems, Statistical Database Security, S Concurrency Control: Transaction, Database System Architecture, Serializability, Locking, Database Recovery: Kinds of Failure, Recovery Techniques, Object, An Overview of Oriented Model, Distributed database: Structure, Tradeoffs, Design, Client Server Database, Knowledge Databases.

Text Books:

1. Henry F Korth & A Silbershatz, Data Base System Concepts, MGH
2. Arun K. Majumdar & P.B hattacharya: Data Base Management, System TMH

Reference Books:

1. Jeffrey O, Ullman: Principles of Database Systems, Galgotia Pub. Co. Ltd
2. Bipin C, Desai: An Introduction to database System Galgotia Pub, Co, LTD
3. James Martin: Principle of Database Management, PHI
4. James Martin: Computer Database organization, PHI

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PAPER (MCS-201) -SYSTEM SOFTWARE

Course Objectives:

- To introduce student the fundamental model of the processing of high level language programs for execution on computer system.
- To explain the basic operations that are performed from the time a computer is turned on until a user is able to execute programs.
- To understand and implement Assembler, Loader, Linkers, Macros & Compilers.
- To introduce students the process management and information management via different software tools.

Course Outcome:

- Understand different components of system software.
- Understand intermediate code generation in context of language designing.
- Recognize operating system functions such as memory management as pertaining to run time storage management.

Unit-wise Syllabus:

UNIT I

Introduction to System Software: The Simplified instructional Computer (SIC): Machine structure (Memory. Register, Data formats.Instruction format, Addressing modes, instruction set. Input/output) Assemblers: Basic Assembler Function (A Simple S IC assembler tables and logic) Machine-dependent Assembler feature (instructionFormats and addressing modes. Program relocation) Machine-independents assembler, features (laterals. Symbol –defining statements, Expression, program blocks, control sections and program linking) . Assembler Design options(Two-pass assembler with overlays Structure one-pass assembler s Multi –pass Assemblers) Implementation Examples.

UNIT II

Loaders and Linkers: Basic Loader Functions. Machine dependent loader features (Relocation, Program Linking, Table and Logic a Linking Loader) , Machine-independent Loader features (Automatic library search, loader upturns, Overlay program), Loader Design option (Linkage editors, Dynamic Linking, Bootstrap Loaders), Text editors Overview of the editing process, User interface editor Structure.

UNIT III

Macro Processors: Basic Macro Processor Functions (Macro definition and expansion, Macro Processor table and logic), Machine Independent Macro Processor Features (Concatenation of macro parameters. Generation of Union sets conditional macro expansion, Keyboard macro parameters), Macro processor Design options recursive macro expansion/ General-purpose macro processors, Macro processing within language Interactive debugging systems, 'debugging function and capabilities, Relationship with other the system. User-interface criteria)

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UNIT IV

Compilers: Basic Compiler Functions (Grammars, Lexical analysis, Syntactic analysis, Code generation), Machine- Dependent compiler Features (Intermediate form of the program, Machine-dependent code optimization, Machine-Independent compiler Features (Storage allocation, Structured Variables, Machine-Independent code optimization, Block-structure Languages), Compiler Design options (division into passes, Interpreters, P-code compilers), Implementation examples.

Text Books:

1. Leland L, Beck: System Software (An Introduction to systems programming), Addison Wesley Publishing Company
2. Alfred Jeffrey Ullman: Principles of Compiler Design, Narosa Publishing Home, new Delhi

Reference Books:

1. D. M Dhamdhare Systems Programming & Operating Systems, THM

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PAPER (MCS-202) SOFTWARE ENGINEERING

Course Objectives:

- Understand Learn and Apply the Theoretical and Practical Knowledge of Software
- Development Such as Software Development Paradigms Process Models Tools and Techniques.
- Understand and Learn the Process of Software Requirements Identification Analysis Review and Learn Recording Requirements in the IEEE Format of the SRS Document.
- Understand the Various Types and Levels of Software Testing and Basic Approaches of Test Case Designing.
- Gain the Knowledge of the Various Models of Software Quality Estimation Quality Assurance and Control.

Course Outcomes:

- Identify Analyze Review and Validate the Requirement of Software Components and
- System and Also Prepare Software Requirement Specification (SRS) Document Using Relevant Standards Tools and Methodologies.
- Manage a Software Project by Applying Project Management Concepts Such as Planning
- Scheduling and Risk Management for Developing Qualitative and Economic Software.
- Work Effectively in Various Profiles of Software Developing Team Such as Software Analyst
- Architecture Programmer Tester Quality Assurance and Control officer Project Manager and Leaders.
- Communicate and Coordinate Competently by Listening Speaking Reading and Writing
- Software Documents
- Apply Coding Standards & Guidelines and Quality Norms in Coding of Software Systems to
- Satisfy the Requirements and Quality.
- Design Test Cases and Optimize the Test Suite for Unit Integration and System-Level Testing Using Various Techniques and Tools for Adequately Testing the Software Components and Systems.

Unit-wise Syllabus :

UNIT I

Introduction: The product and the process, program vs software products, Emergence of software engineering, software development life cycle models, classical waterfall, iterative waterfall, prototyping evolution, spiral & RAP model, comparison of various life cycle models, project management process, process management process.

UNIT II

Software Requirement Analysis & Specification (SRAS): Need for software requirement specification, requirement process, requirement analysis, requirement specification, planning a software project, cost

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estimation. Project scheduling, staffing & personnel planning, software configuration management, plans: Quality assurance plan, risk management.

UNIT III

Software Design: Criteria for Software design, software design & design principle, module level coupling and Cohesion, design notation & specifications, design methodology verification design, Basic concepts, design methodology & metrics, object oriented VS function oriented design, detailed design.

UNIT IV

Coding and Testing: Standard guideline for coding, programming practice, testing fundamentals, unit testing, verification vs validation, black box & white box testing, functional testing, structural testing, object oriented program testing, software reliability & quality assurance; CASE, software maintenance

Text Books:

1. Pankaj Jalote: An Integral Approach to Software Engineering, Narosa
2. Rogers Pressman. Software Engineering, a practitioner's approach, MGH

Reference Books:

1. 1 Rajib Mall: Fundamental of Software Engineering, PHI
2. 2 Richard Farley: Software Engineering Concept, THM -

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PAPER (MCS- 203 A)- OBJECT ORIENTED PROGRAMMING

Course Objectives:

- To Understand how C++ Improves C with Object-Oriented Features.
- To Learn how to Write Inline Functions for Efficiency and Performance.
- To Learn the Syntax and Semantics of the C++ Programming Language.
- To Learn how to Design C++ Classes for Code Reuse.
- To Learn how to Implement Copy Constructors and Class Member Functions.
- To Learn how to Overload Functions and Operators in C++.
- To Learn how Containment and Inheritance Promote Code Reuse in C++.
- To Learn how to Use Exception Handling in C++ Programs.

Course Outcomes:

- Explain Concepts and Advantages of Object Oriented Programming.
- Apply and implement the concepts of the Object-Oriented paradigms to analyze design and develop the solutions of real world problems using the Principles of information Hiding Localization and Modularity.
- Design Develop and maintain the small applications system utility for societal and academic problems using reusability concepts in team spirit.
- Demonstrate the Advanced Features of C++ Specifically Stream I/O Templates and Operator Over loading and Overriding.

Unit-wise Syllabus:

UNIT I

Introduction to OOP: Procedural, Structured and Object Oriented PROGRAMMING (OOP), Basic concepts of OOP: Object, Classes, Inheritance, Polymorphism, Reusability, Benefits & application of OOP, C++ program, basic data type , user defined data types, reference variable, operators, structures, union and enum, Functions : prototypes, default arguments, const arguments in functions, Inline functions, call by reference, function overloading, Friend and virtual Functions.

UNIT II

Classes and objects: Declaring a class, defining an object, data hiding and encapsulation, public and private data member & functions, constructors & destructors, parameterized constructors, multiple constructor in a class, copy constructors, array of object, object as function, arguments, returning object, the this pointer, memory allocation for objects, operator overloading- unary and binary operators, type conversions, pointers to functions.

UNIT III

Inheritance: Inheritance and derivation, single, multilevel, multiple, hierarchical & hybrid inheritance, constructors in multiple inheritance, private and protected inheritances, overriding functions, virtual

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methods, ambiguity resolution, pure virtual functions, virtual functions and & destructors, object slicing, member classes: nesting of classes.

UNIT IV

Streams: C++ streams, stream classes, unformatted & formatted I/O operations, member functions of c-In, manipulators, managing output with manipulators, user defined manipulators with arguments, Files: Classes for file stream operations file I/O with streams, file modes, binary versus text files, binary I/O random access, error handling during file operations, command line arguments, elementary database management, Templates & Exception handling

Text Books:

1. E, Balagurusamy, Object Oriented Programming with C++, TMH
2. Jesse Liberty, Teach Your self ANSI C++ Tec media
3. Robert Lafore, Object Oriented Programming in Turbo C++, Galgotia Publications

Reference Books:

1. Stroustrup, The C++ Programming Language, Addison Wesley
2. Herbert Schild, C++ Complete Reference, THM
3. Yashwant Kanatkar, Let us C++ ,BPD

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PAPER (MCS- 203 B)- PROGRAMMING IN PYTHON

Course Objectives:

- To Introduce Python Programming Language as Multipurpose Programming Language with Features and Applications.
- To Learn Installing Python and Introducing Cross Multiplatform Usage of Python.
- To Practice Basic Language Features of Python.
- To Implement Oops Concepts Using Python.
- To Work with Files in Python

Course Expected Outcome:

- Install and use Python on Various Platform.
- Understand and Explain the features of Python language
- Design and Develop Python applications for data analysis using object-oriented concept .
- Build package and modules in Python with reusability and exception Aspect
- Write programs for Reading and Writing files in Python.

Unit-wise Syllabus :

UNIT I

Environment Setup of Python Application Area, Interactive Mode and Script Mode Data Types, Mutable and Immutable Variables, Expressions and Statements, Variables and Keywords, Operators and Operands in Python, Expressions and Statements; Taking Input (Using Raw_Input( ) and Input( ) and Displaying Output. Functions: Importing Modules, Invoking Built in Functions, Functions from Math Module, Functions from Random Module. Function from Date Time Module, Functions from Re-module Composition Defining Functions, Invoking Functions, Scope, Passing Parameters, Scope of Variables, Void Functions and Functions Returning Values, Recursion Conditional and Looping Construct, use of Compound Expression in Conditional and Looping Construct

UNIT II

Strings: String Operators, Comparing Strings Using Relational Operators; String Functions & Methods, Regular Expressions and Pattern Matching Lists: Concept of Mutable Lists, Creating, Initializing and Accessing the Elements, Traversing, Appending, Updating and Deleting Elements, Composition, Lists as Arguments, List Operations, List Functions and Methods
Dictionaries: Concept of Key-Value Pair, Creating, Initializing and Accessing the Elements in a Dictionary, Traversing, Appending, Updating and Deleting Elements. Dictionary Functions and Methods
Tuples: Immutable Concept, Creating, Initializing and Accessing Elements in a Tuple, Tuple Assignment, Tuple Slices, Tuple Indexing, Tuple Functions.

UNIT III

Concept of Object Oriented Programming: Data Hiding, Data Encapsulation, Class and Object, Polymorphism, Inheritance, Advantages of Object Oriented Programming Over Earlier Programming

Methodologies Classes: Defining Classes (Attributes, Methods), Creating Instance Objects, Accessing Attributes and Methods, Using Built in Class Attributes (Diet, Doc, Name, Module, Bases), Constructor (Init(), Del() and Str()) Methods in a Class, Private Attributes (Limited Support), Importance of "Self" (Acts as a Pointer to Current Calling Object) Operator Overloading with Methods

UNIT IV

Inheritance: Concept of Base Class and Derived Class: Single, Multilevel and multiple Inheritance Overriding Methods, Using Super() in Derived Class to Invoke Init() Or Overridden Methods of Parent Class Data File: Need for Non-Bold for Data File, Types of Data File-Text and Binary, Opening and Closing Files- Open(), Close(), Access Modes (Output, Input, Default), File Object, Access_Modes, Reading and Writing a File Read(), Readline(), Readlines(), Write(), Writeliness File Positions (Seek(), Tell()), Renaming and Deleting a File, Flush(),Implementation of Basic File Operations on Text and Binary File in Python.

Reference Books :

1. Mark Lutz Learning Python, 5th Edition o'reilly Publication
2. Fabrizio Romano Learning Python - Download Link – Https://Www.Packtpub.Com/Packt/FreeEbook/Learning-Python
3. Mark Lutz Learning Python (Fourth Edition) –Download Link Http://Freebook.Qiniudn.Com/Learning%20python,%204th%20edition.Pdf
4. Https://Docs.Pythot.Org/3/Tutorial/Index.Html

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PAPER (MCS- 204 A) - COMPUTER NETWORK

Course Objectives:

- Build an Understanding of the Fundamental Concepts of Computer Networking.
- Familiarize the Student with the Basic Taxonomy and Terminology of the Computer
- Networking Area.
- Introduce the Student to Advanced Networking Concepts Preparing the Student for Entry Advanced Courses in Computer Networking.

Course Outcome:

- Demonstrate the Basic Concepts of Networking Principles Routing Algorithms, IP Addressing and Working of Networking Devices.
- Demonstrate the Significance Purpose and application of Networking Protocols and Standards.
- Describe compare and contrast LAN WAN MAN Intranet Internet AM FM PM and Various Switching Techniques.
- Explain the working of Layers and apply the various protocols of OSI & TCP/IP model.
- Analyze the Requirements for a Given Organizational Structure and Select the Most Appropriate Networking Architecture and Technologies.
- Design the Network Diagram and Solve the Networking Problems of the Organizations with Consideration of Human and Environment.
- Install and Configure the Networking Devices.

Unit-wise Syllabus:

UNIT I

Introduction to Networks:

Basics of Data Communications LAN, MAN, WAN. Various LAN Topologies, OSI Reference Model, TCP/IP Reference Model, Comparison of OSI and TCP/IP Reference Models, Physical Layer: Inter-Comparison of various communication media, Hardware and Software requirements for networking. Wireless communication: Radio& microwave Communication, Satellites: Geostationary Satellites, Lo w Orbit .Satellites, overview of VSAT, Broadband ISDN.

UNIT II

Data Link Layer: Data Link Layer Design Issues: Services Provided to Network Layer, Framing Error Control, Flow Control, Error Correction Codes. Error Detection Codes, Elementary Data Link Protocols – An unrestricted simplex Protocol, simplex s top-and-wail -protocol ,Simplex protocol for a noisy channel ,Sliding Windows Protocols - One bit sliding window protocol ,protocol using Go Back n Protocol using selective repeat.

UNIT III

Medium Access Sub- layer and the Network Layer: Multiple Access Methods - ALOHA, CSMA Protocols, Limited-Content ion Protocols, IEEE STNDARD FOR LANs AND MANS. Standard for Ethernet, Token Bus, Token Ring, Comparison of three, Bridges From 802.xt o 802.y. – The Network

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Layer: Routing Algorithms: Shortest Path, Routing, Flooding, Flow Based, Routing, Hierarchical Routing, Broad Cast – Routing General Principles of Congestion control, Flow Specification, Internetworking, Tunneling Fragmentation IP, Protocols, IP Addresses

UNIT IV

The Transport and Application Layers: Elements of Transport Protocols: Addressing, establishing connection, Releasing connection flow control and buffering, multiplexing, crash recovery, internet Transport Protocols: TCP service model TCP protocol, TCP connection management, TCP congestion control, UDP, Network Security: Traditional cryptography, two fundamental Cryptographic principles, Secret key algorithms, public key, DNS- Domain name systems, SNMP, Electronic mail, World Wide Web

Text Books:

1. A. S. Tanenbaum : Computer Networks, PHI

Reference Books:

1. James Martin: Computer Networks& Distributed processing, PHI
2. Uyless Black: Computer Networks, PHI

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PAPER (MCS- 204 B) – BIG DATA ANALYSIS

Course Objectives:

- Familiarize the Students with Most Important Information Technologies used in Manipulating, Storing, and Analyzing Big Data.
- This Course Gives Students all Around Learning of the Big Data Framework using Hadoop and Spark, Including Yarn, HDFS and Map reduce
- It Provide an Overview of Approaches Facilitating Data Analytics on Huge Datasets.

Course Outcome:

- Ability to identify the characteristics of datasets and compare the trivial data and big data for various applications.
- Demonstrate an ability to use Hadoop framework to efficiently store retrieve and process Big Data for Analytics.
- Implement several Data Intensive tasks using the Map Reduce Paradigm

Unit-wise Syllabus :

UNIT I
Big Data- Introduction, Traditional vs. Big Data Business Approach, Big Data Analytics, Advantages, Applications, Distributed & Parallel Computing for Big Data, Components in Big Data Architecture, Virtualization Approaches.

UNIT II
Hadoop- Introduction, Features, Advantages, Versions, Key Considerations of Hadoop, RdbmsVsHadoop, Hadoop Ecosystem, HDFS - Architecture, Features, Commands, Processing Data withHadoop, Hadoop Yarn.

UNIT III
Mapreduce Framework, Features, Uses, Working onMapreduce, Mapreduce Input and Output Operations, Exploring Map and Reduce Functions, Mapreduce Optimization Technique, HBASE Introduction, Architecture, HBASE in Hadoop Applications.

UNIT IV
Processing Data withMapreduce, Task Execution & Environment – Installation of Eclipse, Hadoop, Java Development Kit and Linux Ubuntu OS, Mapreduce Program Steps to Obtain Word Count, Functionality of Input Format- Inputsplit, Recordreader, Fileinputformat, Output Process of Fileoutputformat – Outputformat, Recordwriter, Role of Combiner, Partitioner, Debugging Mapreduce.

Reference Books:

1. Rob Kitchin The Data Revolution: Big Data Open Data Data Infrastructures And Their Consequences SAGE Publications Ltd
2. Croll and B. Yoskovitz Lean Analytics: Use Data to Build a Better Startup Faster o'reilly
3. Mayer-Schönberger and K. Cukier Big Data: A Revolution That Will Transform How We Live Work and Think

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DEPARTMENT OF COMPUTER SCIENCE A.P.S. UNIVERSITY, REWA (M.P.)
SYLLABUS FOR M.SC. COMPUTER SCIENCE
(SESSION 2020-2021)

PAPER (MCS- 205) – ADVANCED PROGRAMMING LANGUAGE

Course Objectives:

- Identify the Basics of .Net Framework, Architecture and User Programs
- Do GUI Programming Using Vb.Net and C#
- Examine the Challenges Involved in .Net Framework Programming
- Do Event Driven Programming Projects
- Learn the ADO.Net Database Usages in Website Creation
- Empower the Websites with use of Xml.

Course Outcome:

- Understand and explore various Features of .Net Framework
- Analyze, Design and Developthe GUIbased Applications softwareusing Vb.Net and C#
- Design, Develop and Implement Complete software Projects using Vb.Net and C# with consideration of Environment in team spirit.
- Analyze the requirement, design and develop Dynamic and Static Websites and Web applications using .Net technology.
- Integrate and Apply Different Components Including Database, XMLwith Proper Choice of Languages Mapping

Unit-wise Syllabus :

UNIT I

Introduction to .Net, .Net Framework Features & Architecture, CL, Common Type System, MSIL, Assemblies: Types of Assemblies, Class Libraries. Event Drive Programming, Methods and Events Related with Mouse and Keyboard. Programming into Visual Studio, Types of Project in .Net, IDE of VB.Net- Menu Bar, Toolbar, Project Explorer, Toolbox, Properties Window, Form Designer, Form Layout, Immediate Window, ASP& HTML Forms

UNIT II

The VB.Net Language- Variables, Declaring Variables, Data Types, Scope & Lifetime of a Variable, Arrays, Types of Array, Control Array, Subroutine, Functions, Passing Argument to Functions, Optional Argument, Returning Value from Function. Control Flow Statements: Conditional Statement, Loop Statement. Forms: Loading, Showing and Hiding Forms, Working with Multiple Forms, Controlling one Form within Another, Overview of C#, Structure of C# Program, C# in .Net.

UNIT III

GUI Programing with Windows Form with Properties, Methods and Events: Text Box Control, Label Control, Button Control, Listbox, Combo Box, Checked Box, Picture Box, Radio Button, Pannel, Scroll Bar, Timer Control, Adding Controls At Runtime, Common Dialog Control: File, Save, Print, Help. Designing Menus, MDI Forms, Overview of Dynamic Web Page, Asp.Net Controls, Applications, Web Servers, Web Form Controls, Server Controls, Client Controls Adding Controls to a Web Form, Form Validation Controls: Client Side Validation, Server Side Validation

UNIT IV

ADO, .Net Architecture, Create Connection, Accessing Data Using Data Adapters and Datasets, Using Command & Data Reader, Data Bind Controls, Displaying Data in Data Grid. Data Form Wizard,

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Processing SQL& Access Database Using Ado.Net Object Model, Connection Object, Command Object, Add, Delete, Move & Update Records to Dataset, Executing Queries, Basics of XML, XML in ADO, Web Service Description Language, Building & Consuming a Web Service, Web Application Deployment, Caching.

Reference Books

1. Steven HoltznerVB.Net Programming-Black Book-Dreamtech Publications
2. Evangelos Petroutsos Mastering VB.Net - BPB Publications
3. Mathew Macdonald-The Complete Reference Asp.Net-TMH
4. Professional ASP.Net- Wrox Publication
5. Stephen Walther Active Server Pages 2.0 (Unleashed) -Techmedia
6. Eric a. Smith Asp 3 Programming Bible: IDG Books
7. C# Programming-Wrox Publication
8. Matt Telles-C# Programming Black Book-Dreamtech Publication

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DEPARTMENT OF COMPUTER SCIENCE A.P.S. UNIVERSITY, REWA (M.P.)
SYLLABUS FOR M.SC. COMPUTER SCIENCE
(SESSION 2020-2021)

PAPER (MCS- 301) - OPERATING SYSTEM

Course Objectives:

- Understand the Services provided by Operating System.
- Understand the Working and Organization of Process and its Scheduling and Synchronization.
- Understand Different Approaches of Memory Management Techniques.
- Understand the Structure and Organization of the File System.

Course Outcomes:

- Identify and describe the Services Provided by Operating Systems.
- Understand and Solve the Problems Involving Process Control Mutual Exclusion
- Synchronization and Deadlock.
- Apply Various Approaches of Memory Management
- Analyze Various Operating System Approaches in Linux and Windows

Unit-wise Syllabus:

UNIT I

Fundamental Concepts of Operating Systems: Overview of Process Management, Memory Management File Management, Device Management, operating system services, Evolution of operating systems - Serial processing, Batch Processing, Multi- Programming, Types of Operating systems- Batch operating system, Time- sharing operating systems, Real- time operating systems, Distributed operating system, Process Management: Process concept, Scheduling concepts, CPU scheduling, Scheduling algorithm, Multiple processor scheduling.

UNIT II

Inter Process Synchronization: Concurrent processer, the critical section problem, the Critical Region and Conditional Critical Region problem, Inter process synchronization, Inter process communication, Deadlock occurrence, Deadlock characterization, Deadlock prevention, Deadlock avoidance, Deadlock detection and recovery.

UNIT III

Memory Management Single Process Monitor, Static Partitioned memory allocation, Swapping, Relocation, Dynamic Partitioned Memory allocation, Compaction, Multiple fence register, Segmentation – Address translation, Descriptors scheduling paging, Page allocation, Virtual memory, Instruction interrupt ability, Management of virtual memory, Page replacement, Replacement algorithms, Comparison of various memory management techniques with reference to Protection and Sharability.

UNIT IV

File and Device Management: File System organization, File operations, Access methods, Directory structure organization, File protection- Goals of protection, Access matrix model of protection, Dynamic

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protection Structure, Security encryption, Device management: Dedicated, Shared and Virtual devices, Sequential Access and Direct Access Devices, Channel and Control Units, I/O buffering, I/O schedulers, Spooling system.

Text Book

1. Peterson & Siberschatz: Operating system concepts, Sybex

Reference Book

1. Senart E. Madnik and J.J. Donovan: Operating Systems, McGraw Kill,
2. Milan Melankvic: Operating Systems, Concept and Design, McGraw Hill
3. Lister Andrew: Fundamentals of Operating Systems, Macmilan pub. Co.
4. Delteri An Introduction to Operating Systems. Addition Wesley.

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DEPARTMENT OF COMPUTER SCIENCE A.P.S. UNIVERSITY, REWA (M.P.)
SYLLABUS FOR M.SC. COMPUTER SCIENCE
(SESSION 2020-2021)

PAPER (MCS- 302) - COMPUTER GRAPHICS AND MULTIMEDIA

Course Objectives:

- The objective is to introduce the use of the components of graphics and will be familiar with building appcoach of algorithms related to them and comprehend the basic principles of 2-dimensional and 3-dimensional computer graphics, an understanding of how to scan, convert the basic geometrical primitives, how to transform the shapes to fit them as per the picture definition
- Provide an understanding of mapping the world coordinates to device coordinates.
- To Provide Students with the Basic Understanding of Multimedia Systems and its Components and Provide the Information about the Standard Tools and Techniques used in Development of Multimedia Components for Productions
- To Create Simple Multimedia Applications and Products for using Standalone Networked or Web Based Computers.

Course Outcomes:

- Student will be able to implement the basic concepts and learn the various algorithms to scan, convert the basic geometrical primitives, transformations, area filling, clipping, viewing,
- Develop Understanding of Technical Aspect of Multimedia Systems. Also To Understand and explain the storage mechanism and applicability of Various File Formats for Audio Video and Text Media.
- Develop the Various Multimedia Systems Applicable in Real Time.
- Create a Multimedia Component Using Various Tools and Techniques.
- Apply the Guidelines and Standards of Multimedia Systems and to analyze the performance of Multimedia System.

Unit-Wise Syllabus :

UNIT I

Overview of Graphics Systems and 2D Transformation: Display Devices, Hardcopy devices, Interactive Input Devices, Display processors, Graphics Software, Output primitives: Points and line drawing algoritams Circle generating algorithms Basic Transformations, Matrix Representations and Homogeneous Coordinates, Composite Transformations, Reflections, Shear, Raster methods for transformations, Windowing and Clipping: Windowing concepts, Clipping algorithms, Window – to – Viewport transformation,

UNIT II

3D Transformation, Viewing and Modeling: Three Dimensional Transformations: Basic transformations, Rotation about an arbitrary axis, Reflections, shears, Transformations of coordinate system, Projections, Viewing Transformations, Software representations, hardware implementation, Hidden surface & Hidden line removal: Classifications, Back Free removal, Depth Buffer method, Scan line method, Hidden line elimination, Curved surfaces, Shading and color model: Modeling light intensities, Displaying light intensities, Surface shading methods, Color models: Modeling methods: Basic concept, Master coordinates and modeling transformation structured, Display files, symbol operations.

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UNIT III

Overview of Multimedia: Introduction, Application of multimedia, terminology, multimedia enabling technologies in digital representation, Hardware & structure requirement, multimedia standard, And hypertext: History, nature, Links navigation & structure. The nature of sound, digitizing sound, processing sound, compression format MIDI, Combining source & picture, Video & image processing: Digitizing video, video standards video compression, digital video editing and post production, streamed video and video conferencing.

UNIT IV

Animation: Captured animation and image sequences, digital cel and sprite animation, key frame animation, 3D animation, Combining media: synchronization based presentation: SMIL(synchronize multimedia integration language), synchronize presentation (HTML + TIME) accessibility, knowledge base multimedia, future direction, ECMA Script syntax outline, Multimedia and network: networks and transport protocols, multicasting, application protocols for multimedia: HTTP caching; Quality of service, server side computation.

Text Books:

1. D. Hearn and Baker: Computer Graphics, Prentics Hall of india Pvt, Ted.
2. Harrington: Computer Graphics, MGH

Reference Books:

1. Newman and R.F. Sprouli: Principles on Interactive Computer Graphics. MGH
2. K. Glloi: Interactive Computer Graphics. PHI
3. A. Piastock and G. Kalley: Theory and Problems of Computer Graphics.MGH Multimedia System: Joh F. Kloegel Buford

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PAPER (MCS- 303 A) - THEORY OF COMPUTATION

Course Objectives:

- To give understanding of several formal mathematical models of computation
- Learn and Understand FSA, DFA, NDFA, Turing Machine, Regular Expression, Push Down Automaton.
- Learn and Understand Properties of Languages, Grammars and Automata and they are able to describe how they relate it to formal languages.
- Gain knowledge of Computing and Mathematics to Solve Problems. And they will understand what is possible and what is not possible with computers.

Course Outcomes

- The student will be able to analyze and compare different computational models.
- Demonstrates Models, Turing Machine, Regular Expression, Push down Automaton.
- Apply and Prove properties of Languages, Grammars and Automata.
- Apply Knowledge of Computing and Mathematics to Solve Problem
- Apply Mathematical Foundations, Algorithmic Principles and Computer Science Theory to the Modeling.
- To identify the limitations of some computational models and possible methods of proving them.

Unit-wise Syllabus:

UNIT -I

Automata Theory: Alphabets, strings languages, recursive definitions, regular expressions, problems on regular expressions, finite automata, transition table, transition diagram, transition graphs, different example of transition graphs, kleen's theorem , proof of kleen's theorem with variety of problem's Nondeterministic, Problem's conversion from Nondeterministic Finite Automata(NFA) to Deterministic Finite Automata (DFA), Finite automata with output, Moore machine, Mealy Machine, decidability.

UNIT -II

Pushdown Automata Theory 1: Context- Fee Grammars: Various examples' including syntax and semantics, productions (grammatical rules), Backus normal form, Parse tree, Regular grammar's Definition, Theorems & examples, Chomsky normal form, pushdown automata, various examples

UNIT-III

Pushdown Automata Theory 2: Context- Free Language: Definition, Theorem, Examples, Non-Context – Free Languages, Intersection & Complement: Theorem and Definitions, Parsing: Top-Down Parsing, Backtracking, Pushdown Transducers, Decidability.

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UNIT-IV

Turing Theory: Turning machine: Definition, theorem & examples, Post Machine: Definition Theorem and examples, Minsk's theorem: Definition, theorem & examples.

Text Book:

1. I.A. Cohen: Introduction to Computer theory, John Wiely.
2. Hopcroft H,E. and Ullman J.D.: Introduction to automata theory Languages and Computation, Narosa publishing house, New-Delhi.

Reference Book:

1. Derick Wood: Theory of Computation, Harpers row publisher New York, 1987
2. Lewis H.R. & Papadimitriou C.H.: Elements of the theory of Computation, PHI, 1981
3. M.L. Minisky: Computations, finite infinite machines, Prentice Hall, 1967

PAPER (MCS- 303 B) – AI & MACHINE LEARNING

Course Objectives:

- To Understand the Concepts of Artificial Intelligence and Machine Learning.
- To Gain Knowledge of Supervised and Unsupervised Learning
- Understand the Design of Learning Systems.
- Understand the Design of Expert Systems.

Course Outcomes:

- Demonstrate and Apply Artificial Intelligence Techniques, Various Types of Production Systems, and Characteristics of Production Systems.
- Design Neural Networks Architecture and Implement Functions and Various Algorithms Involved.
- Fuzzy Logic, Various Fuzzy Systems and their Functions.
- Genetic Algorithms, its Applications and Advances
- Able to Analyse and Design Expert Systems through Learning the Machine

Unit-wise Syllabus :

UNIT-I

AI Introduction, The AI problems. AI technique, Characteristics of AI Applications, Current Trends in AI. Machine Learning: Machine Learning Overview, Design of a Learning system, Types of machine learning, Applications of machine learning, Variables and probabilities - Probability Theory, Probability distributions

UNIT-II

Problem Solving, General Problem Solving, Production Systems, Control Strategies Forward and Backward Chaining, Searching :Searching for Solutions, Uniformed Search Strategies – Breadth First Search, Depth First Search. Heuristic Search, Greedy Best First Search, Knowledge Representations Mapping & Issues

UNIT-III

Soft Computing: Introduction to Soft Computing, Soft Computing vs. Hard Computing, Various Types of Soft Computing Techniques, Applications of Soft Computing. Basic Concepts of Neural Network, Human Brain- Biological Neural Network, Evolution of Artificial Neural Network, Structure and Function of a Single Neuron, Difference Between ANN and Human Brain, Characteristics and Applications of ANN, Learning Methods, Activation Function, Neural Network Architecture.

UNIT-IV

Supervised Learning and Unsupervised Learning, Competitive LearningNetworks – Kohonen Self-Organizing Networks, Introduction to expert system and application of expert systems, case studies, MYCIN Fuzzy Logic: Fuzzy Set Theory, Crisp Set, Fuzzy Set, Operations on Fuzzy Sets: Compliment, Intersections, Unions, Product, Difference, Properties of Fuzzy set, Genetic Algorithm: Fundamentals, Basic Concepts, Working Principle, Encoding, Fitness Function, Reproduction.

Reference Books:

1. Elaine Rich and Kevin Knight "Artificial Intelligence" - Tata McGraw Hill.
2. Dan W. Patterson "Introduction to Artificial Intelligence and Expert Systems", Prentice India.
3. Nils J. Nilson "Principles of Artificial Intelligence", Narosa Publishing House
4. Christopher Bishop, "Pattern Recognition and Machine Learning", Springer
5. Kevin P. Murphy, "Machine Learning: A Probabilistic Perspective", MIT Press
6. EthemAlpaydin, "Introduction to Machine Learning", MIT Press
7. Tom Mitchell, "Machine Learning", McGraw-Hill
8. Stephen Marsland, "Machine Learning - An Algorithmic Perspective", Chapman and Hall/CRC Press
9. S. Rajasekaran& G.A. VijayalakshmiPai, Neural Networks, Fuzzy Logic & Genetic Algorithms, Synthesis & Applications, PHI publication.
10. S.N. Sivanandam&S.N.Deepa, Principles of Soft Computing, Wiley Publications.

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DEPARTMENT OF COMPUTER SCIENCE A.P.S. UNIVERSITY, REWA (M.P.)
SYLLABUS FOR M.SC. COMPUTER SCIENCE
(SESSION 2020-2021)

PAPER (MCS- 304 A) - ADVANCED COMPUTER ARCHITECTURE

Course Objectives:

- To provide a comprehensive knowledge of scalable and parallel computer architectures.
- To understand how to achieve better performance with increased system resources.
- To learn how system resources are scaled by the number of processors used, the memory
- capacity enlarged, the access latency tolerated, the I/O bandwidth required, the performance level desired.

Course Outcomes:

- Understand different processor architectures and system-level design processes.
- Understand the principles of I/O in computer systems, including viable mechanisms for I/O and secondary storage organization.
- Understand different processor architectures and system-level design processes

Unit-wise Syllabus:

UNIT I

Parallel Processing: Reduced instruction set Computers- CISC characteristics RISC characteristics, overlapping register windows, The Berkley RISC system. Introduction to Parallel Processing- Evolution of Computer system, parallelism in Uniprocessor systems, parallel computer structure, architectural classification schemes, parallel processing Application (Business & scientific).

UNIT II

Principles of Pipelining and Vector Processing: Principal of linear pipelining , classification of pipeline processor, General pipeline & Reservation Tables, Interleaved memory organization, Instruction & Arithmetic pipelines: - Design of pipelined Instruction Units, Arithmetic pipelines Design Examples, Multifunction and array pipeline, Principles of designing pipelined processor, Vector processing- Vector Operations, Matrix Multiplication , Memory Interleaving, Super Computers.

UNIT III

Array Processors: Structures and Algorithms for array processor (SIMD Array processor, Marking and Data Routing mechanisms, Inter –PE communication) SIMD Interconnection Networks (Static Versus Dynamic. Network, Mesh-Connected Lilac network, cube inter connection network) parallel algorithms for Array processors (SIMD matrix Multiplication, parallel sorting on Array processors)

UNIT IV

Multiprocessor Architecture and programming: Functional Structures (Lossely coupled Multiprocessors, Tightly coupled Multiprocessors. Processor characteristic for Multiprocessing), Inter connection, Networks Time shared common bus, Multiport Memory, Crossbar Switch, Multistage Switching Network, Hyper Cube System, Inter Processor Arbitration (system bus, serial arbitration procedure, parallel arbitration logic, dynamic arbitration algorithms), Inter processor communication and synchronization,. Cache coherence, Conditions for incoherence solution to cache coherence problem,

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Parallel memory organizations (Interleaved memory configurations). Multiprocessor Operating Systems (classification of Multiprocessor operating systems).

Text Books:

1. Kai Hwang & Faye A, Prigs: Computers Architecture and parallel processing, MGH
2. M, Morris Mano: Computer System Architecture, PHI

Reference Book:

1. Andrew S. Tannenbaum: Structured Computer Organization, PHI
2. Hohn P. Hayes: Computer System Architecture and Organization, MGH

DEPARTMENT OF COMPUTER SCIENCE A.P.S. UNIVERSITY, REWA (M.P.)
SYLLABUS FOR M.SC. COMPUTER SCIENCE
(SESSION 2020-2021)

PAPER (MCS- 304 B) – INFORMATION & NETWORK SECURITY

Course Objectives:

- Aware and Understand the Challenges and Scope of Information Security. Gain the Knowledge of Basic Security Concepts.
- Learn and Understand the Importance of Cryptographic Algorithms and Their Uses.
- Learn and Understand Access Control Mechanism Used for User Authentication and Authorization. Understand and Practice the Sockets Layer (SSL).

Course Outcome:

- Explain the Principlesof Cryptography and Cryptanalysis Including Symmetric and Asymmetric Encryption, Hashing, and Digital Signatures.
- Explain the Fundamental Notions of Threat, Vulnerability, Attack and Countermeasure.
- Be able to Identify the Security Goals of an Information System, Point Out Contradictory Goals and Suggest Compromises.
- Identify and Classify Particular Examples of Attacks.
- Implement the Various Security Algorithms.

Unit-wise Syllabus :

UNIT-I

Introduction: Security Concepts:-Confidentiality, Integrity, and Availability,Threats, Risks, Sources of Threats, Attacks Classification, Cryptography, Confusion Vs. Diffusion, Stream Ciphers Vs. Block Ciphers, Classical Cryptography, Objectives of Cryptography, Secret-Key and Public-Key Cryptography, Cryptanalysis, RC5, Blowfish.

UNIT- II

Block Ciphers Block Cipher Principles, Feistel Networks, S-Boxes and P Boxes, Block Cipher, Des, Elementary Number Theory, Prime Numbers, Factoring, Modular Arithmetic , GCD, Modular Square Roots, Key Exchange: Diffie-Hellman, Public-Key Encryption: RSA, Entity Authentication: Passwords, Challenge-Response Algorithms, Digital Signature, Digital Certificates, X509 Certificates, SSL, HTTPS, and IPSEC.

UNIT- III

Introduction to Hash Function : Message Digest: MD5 and SHA-1, Attacks on Hash Functions., MD Family, SHA Family, Trapdoor Functions, Digital Signatures, Overview of GPG, Seahorse, Frontends– Kleopatra, Enigmail.

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UNIT- IV

Network Issues, Public- Key Infrastructure (PKI), Kerberos, Encryption Using Non-Cryptographic Tools (Vl,Zip), Authentication Principles and Methods, Passwords, Two-Factor Authentication, Steganography, Penetration Testing and Ethical Hacking.

Reference Books

1. William Stallings, Cryptography and Network Security, PHI.
2. Bruce Schneier- the Mathematics of Encryption- American Mathematical Society
3. Atulkahate, "Cryptography and Network Security", TMH.
4. Calabrese, Info Security Intelligence-Cryptography Principles Appl- Cengage Learn.
5. Krawetz- Intro to Network Security, Cengage Learning.
6. Bruce Schneier, Applied Cryptography, John Wiley and Sons Mark Stamp,

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DEPARTMENT OF COMPUTER SCIENCE A.P.S. UNIVERSITY, REWA (M.P.)
SYLLABUS FOR M.SC. COMPUTER SCIENCE
(SESSION 2020-2021)

Paper (MCS- 305) –Java Programming

Course Objectives:

- Introduce and Learn the Usage of the Java SDK Environment to Create Debug and Run Java Programs.
- Understand Fundamentals of Java Programming Such as Character Set Variables Data Types and Control Structures Array Class and Methods etc.
- Understand the Concepts of OOPs and Learn Implementation of them in Java by Defining Classes Invoking Methods using Class Libraries.
- Introduce Strings Vectors Interfaces Packages and Threads Handling in Java.
- Gain the Knowledge of Java Applets AWT Swings Servelet.
- Learn and Understand the GUI Application Web Applications N-Tier Architecture.
- Develop the Understandings of the Basic Knowledge of File Handling Database Connectivity Java Servelet and Web Application.

Course Outcomes:

- Explain and apply the Object Oriented Concepts for Solving Real Problem.
- Use the Java SDK Environment to Create Debug and Run Simple Java Programs.
- Apply Java Technology to Develop the Small Applications Utilities and Web Applications.
- Apply Event Management and Layout Managers Using AWT Swing JDBC and Servlet for Developing the Software for Various Problems.

Unit-wise Syllabus:

UNIT- I

Introduction: C,C++ Java a comparison, Structure of simple Java Program, Java tokens, Statements, Java Virtual machine, Command line arguments, Programming style, Constants & variables, Type casting; Various Operators in Java, Conversions in expressions, Operator, precedence and associatively. Decision making and branching: The if Statement, the switch statement, the? Operators, the while statement, the do statement. The for statement, jumps in loops, labeled loops, classes, objects and, methods, Constructors, method overloading, static members, nesting of methods.

UNIT-II

Inheritance: Overriding methods, final variables and methods, final classes, abstract methods and classes. Arrays and ve3ctors: arrays, vectors, wrapper classes, conversion from and to primitive classes, interfaces, packages, Multithreaded programming: creating threads, extending the thread class, stopping and blocking thread, life cycle of a thread, using thread methods, thread exceptions, thread priority , synchronization, the runnable interface, managing errors and exceptions, File : I/O exceptions, creation of files, concatenating & buffering files

UNIT-III

Event: event Source, event listener, overview of event classes(action event, adjustment event, item event, focus event, text event, mouse event), handling keyboard event. Abstract Window Tool: windows fundamental, creating Frame window, handling event in frame window, displaying information within

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window, label, button, checkbox and text field controls, String: string constructor, operations on string, strung searching, overview of java library (math class, system class) Overview of collections.

UNIT-IV

String and Applets: Interface Components with swing: Swing buttons, text Input, making choices, using radio and checkbox, scroll bars, Applets: Applet Basics, life cycle of an Applet, applet initializations and termination, simple applet display method, status window, passing parameter to applet,

Text Books:

1. E. Balagurusamy, "Programming with Java a Primer" TMH ISBN-13: 978-0-07-061713-1
2. Isbn-10: 0-07-061713-9.
3. Patrick Naughton and Herbert Schildt "Java: the Complete Reference" TMH Publication ISBN 0-07-463769-X.
4. Yashavant kanetkar "Let us Java" BPB Publications.
5. Ivan Bayross "Web Enabled Commercial Application Development Using HTML DHTML
4. Javascript Perl CGI" BPB Publications
5. Cay Horstmann "Big Java" Wiley Publication
6. Peter Norton "Java Programming" Techmedia Publications.
7. Joseph Weber "Using Java 1.2" PHI Isbn-81-203-1558-8.

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Programme- PGDCA

Programme Outcomes

- POs.1 The Goal of Program to prepare for all computer Knowledge and Languages in one year.
- POs.2 Analyze the System and maintain the relationship.
- POs.3 Different hardware & software specification which will be computer.
- POs.4 Understanding application of Different software needed for rular areas development.
- POs.5 To identify , software engineering, networking, hardware knowledge,
- POs.6 To utilize the techniques, skills &modern programming tools, software development practice.
- POs.7 Effective Computer Skills And development personality

Program Specific Outcome

- PSOs.1 Understand Basic concept, and Programming language like procedure oriented language, Object oriented programming, event driven programming.
- PSOs.2 Different Hardware and software specification.
- PSOs.3 Understanding application of different software. Needed for area development like shakari sanstha online treading, institute

PGDCA-101- Computer Fundamentals

- COs.1 Use and identify various art (input output devices) of computer system.
- COs.2 Explain functions of various parts and function of computer.
- COs.3 Use Linux operating system and create files and folders. Explain Software Hardware Components of Computer system.

PGDCA -102-(A) Programming in "C"

- COs.1 Explain the Basic Terminology Used in Computer Programming
- COs.2 Explain the Process of Problem Solving Using Programming Language.
- COs.3 Write Compile and Debug Programs in Language.
- COs.4 Analyze and Solve Complex and Real Life Problems by Developing Application Programs using C Programming Language

PGDCA -102-(B) Multimedia Application

- COs.1 Develop Understanding of Technical Aspect of Multimedia Systems
- COs.2 Understand and explain the storage mechanism and applicability of Various File Formats for

COs.3 Audio, Video and Text Media Develop Various Multimedia Systems Applicable in Real Time

COs.4 Create a Multimedia Component Using Various Tools and Techniques.

COs.5 Apply the Guidelines and Standards of Multimedia Systems and to Analyze the performance of Multimedia System

PGDCA-103-(A) Analysis and Design of Information System

COs.1 Explain the Characteristics, Components, Activities of SDLC, Models of Information Systems, Types of Information Systems and Benefits of Various Information Systems Identify, Analyze, Review and Validate the Requirement of Information System and Also Prepare System Requirement Specification (SRS) Document.

COs.2 Design, Develop Implement, Deploy and Evolve the Efficient, Reliable, Robust, and Cost Effective Information System

COs.3 Apply Universal Modelling Language (UML) to Analyze and Model the Solutions of Information System Problems

COs.4 Work Effectively in Various Roles of System Analyst Such as Problem Investigator Communicators, System Designer, Tester, Project Manager and Maintenance Engineer

PGDCA-103-(B) E-Commerce and E-Governance

COs.1 Explain and demonstrate E-Governance Initiatives at the National Level in India

COs.2 Make Classification of E-Commerce and E-Governance

COs.3 Students Able to Think Critically and Analytically to New Successful Business Ideas

PGDCA-104-Office Automation S/W Tools

COs.1 Creating Word Documents for office use Knowledge of Mail Merge

COs.2 Use of Formatting Techniques and Presentation Styles Provide Professional Services to the Society

COs.3 Create Presentation Using Animation and Transition and other features.

COs.4 Construct Formulas Including the use of Built-in Functions and Relative and Absolute

COs.5 References and Create and Modify Charts and Preview and Print Worksheets

PGDCA-201-(A) Java Programming

COs.1 Explain and Apply the Object Oriented Concepts for Solving Real Problem. Use the Java 5DK Environment to Create, Debug and Run Simple Java Programs.

COs.2 Apply Java Technology to Develop the Small Applications, Utilities, and Web Applications

COs.3 Apply Events Management and Layout Managers Using AWT. Swing JDBC and Servlet for Developing the Software for Various Problems.

PGDCA-201-(B) Web Technology

COs.1 Describe the concepts of WWW including Browser and HTTP Protocol.

COs.2 List the Various HTML Tags and use them to develop the User Friendly WebPages Define the CSS with its Types and use them to provide the Styles to the Web Pages at Various Levels Develop the Modern Web Pages using the HTML and CSS Features with different layouts as per Need of Applications Use the Java script to develop the dynamic WebPages.

COs.3 Use Server Side Scripting with PHP to Generate the Web Pages dynamically using the Database Connectivity

COs.4 Develop the Modern Web Applications using the Client and Server Side Technologies and the Web Design Fundamentals

PGDCA-202-(A) Computer Network

COs.1 Demonstrate the Basic Concepts of Networking. Networking Principles Routing Algorithms IP

COs.2 Addressing and Working of Networking Devices

COs.3 Demonstrate the Significance Purpose and application of Networking Protocols and Standards.

COs.4 Describe compare and contrast LAN WAN MAN Intranet Internet AM FM PM and Various Switching Techniques.

PGDCA-202-(B) Big Data Analysis

COs.1 Ability to identify the chances of datasets and compare the trivial data and big data for various applications

COs.2 Demonstrate an ability to use Hadoop framework to efficiently store retrieve and process Big Data for Analytics

COs.3 Implement several Data Intensive tasks are the Magi reduce Paradigm

PGDCA-203-Database Management System

COs.1 Understand and describe the basic concepts and terminology of Data Management System Analyze and Design the database of applications using ER modelling and Normalization.

COs.2 Evaluate business information problem and find out the data requirements of organization.

COs.3 Demonstrate the database schema, data modelling and normalization process with the help of example Implement the database designing appropriate database tools

AWADHESH PRATAP SINGH UNIVERSITY
REWA (M.P.) 486003

CBCS
CURRICULAM & SYLLABUS

POST GRADUCATE DIPLOMA IN COMPUTER SCIENCE & APPLICATION (PGDCA)

(ONE YEAR TWO SEMESTERS)

(UGC Approved)

Course Code: 05

www.apsurewa.ac.in

Approved by Board of studies dated 21-09-2020

A.P.S. UNIVERSITY, REWA (MP)
POST GRADUCATE DIPLOMA IN COMPUTER SCIENCE & APPLICATION (PGDCA)
SCHEME OF EXAMINATION (w.e.f. session 2020-21)

PGDCA Semester -I

Paper Code	Course Code	Paper Name	Course Type	Credits	Theory Paper	Internal Assessment	Maximum Marks
1051	PGDCA -101	Computer Fundamentals	CC	04	60	40	100
10521 10522	PGDCA -102	**Elective I:: (Any one of the following considering departmental constraints)** (A) Programming in C (B) Multimedia Application	DCE	04	60	40	100
10531 10532	PGDCA -103	**Elective II:: (Any one of the following considering departmental constraints)** (A) Analysis and Design of Information System (B) E-Commerce and E-Governance	DCE	04	60	40	100
1054	PGDCA -104	Office Automation S/W Tools*	GE	04	60	40	100
1055	PGDCA-105	Software Lab I (Problem based on Paper 102)	Lab	02	60	40	100
1056	PGDCA-106	Software Lab II (Problem based on Paper 101 & 104)	Lab	02	60	40	100
1057	PGDCA-107	Comprehensive Viva/ Project	Viva	04			100
		Semester Total		**24**			**700**

PGDCA Semester – II

Paper Code	Course Code	Paper Name	Course Type	Credits	Theory Paper	Internal Assessment	Maximum Marks
20511 20512	PGDCA-201	**Elective III:: (Any one of the following considering departmental constraints)** (A) JAVA Programming (B) Web Technology	DEC	04	60	40	100
20521 20522	PGDCA-202	**Elective IV:: (Any one of the following considering departmental constraints)** (A) Computer Networks (B) Big Data Analysis	DCE	04	60	40	100
2053	PGDCA-203	DBMS*	GE	04	60	40	100
2054	PGDCA-204	Software Lab I (Problem based on 201)	Lab	02	60	40	100
2055	PGDCA-205	Software Lab II (Problem based on 203)	Lab	02	60	40	100
2056	PGDCA-206	Application Project	Project	04			100
2057	PGDCA-207	Comprehensive Viva	Viva	04			100
		Semester Total		**24**			**700**

CC: Core Course GE: Generic Elective DCE: Discipline Centric Elective

* Student may choose this course as a Generic Elective or may choose a Generic Elective Course Offered in other UTDs at the same level or may choose a course offered by MOOCs through SWAYAM

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OBJECTIVES:

Post Graduate Diploma in Computer Applications (PGDCA) is designed for graduate students who are seeking professional knowledge in computer applications and are keen to equip the students with requisite knowledge, skills and right attitude necessary for becoming efficient Computer / IT Professionals. This course is useful for students who want to learn computer applications in different fields like banking, insurance, government sectors and accounting. This programme covers a blend of computer subjects like programming languages, data base management, systems analysis, Operating system, PC packages and computer software development in specific applications.

The main objectives of the programme are:

- To gain practical, hands-on experience in computer applications and tools playing a significant role in business, banking and government sectors.
- Tomakesustainedeffortsforholisticdevelopmentofthestudentsandempower them to analyze, develop, configure IT solutions keeping in view the challenges posed by changing IT requirements.
- To develop competent computer management professionals with strong ethical values

ELIGIBILITY:

Every candidate seeking admission to the program shall have Bachelors Degree or a Post-Graduate Degree with at least 45% marks from any statutory University.

OR

Candidates who do not posses requisite eligibility at the time of application but plan to appear in the final year of a degree examination may also apply. However, such candidates can be provisionally considered only upto a specified date notified by the University.

Age Limit: No Upper Age Limit. As per State Government norms.

Admission Procedure:

The admissions will be done as per merit in the entrance test conducted by the university

Seats: 60 (reservation as per state Govt. rules).

About the Department of Computer Science & Applications:

The Department of Computer Science and Applications was established in the year 1990 with the aim of developing professionals in main stream of Computer Science and Applications. The Department offers PhD and Postgraduate degree courses through UTD. The Department studies market trends and new developments in the area, conducts massive brainstorming with leading academia and industry professionals to develop the curricula.

The Department is committed to provide excellence in teaching. It has a rich knowledge

pool of well-trained faculty and a modern computer lab enabled to impart all required knowledge, along with its own library with latest books on various advanced areas in computers. Regular hands-on workshops are conducted to update students with the latest technology.

Between 2005 to 2010 Department had also run M.Sc. Bioinformatics/ APGDBI Course with partial financial support from UGC Innovative Program & DBT BIF scheme, which in subsequent years were suspended due to financial crunch/ decline in no. of students.

Many of the alumni are working in top companies including IBM, MicroSoft, American Express Bank, Wipro, Infosys, Samsung, Microsoft, WorldPay, CISCO, HCL, Jindal, Web Dunia and more in India as well as abroad, apart from few also being entrepreneurs and some other, in academics with prestigious institutions.

Program Objectives:

- To empower students with basic skills of various technologies.
- To develop the ability to identify, analyze, formulate and develop computer applications.
- To enable the students to select modern computing tools and techniques and use them with dexterity.
- If you are looking for challenging roles in the IT industry, computer science research, web and mobile development, data analysis, information security etc., this programme is for you.

Career Path after Completing the Programme:

- Software Developer Programmer
- Systems Analyst
- Computer Support Engineer
- Database Administrator
- Systems Administrator
- Web Designer & Developer
- Network Administrator
- Data Entry Operator

SEMESTER I
PGDCA101- COMPUTER FUNDAMENTALS

Course Objectives:

- Identify all the parts and main functions of computers.
- Acquaint the students with the applications of computers and understanding latest trends in information technology.
- Learn Basics of software Systems and Linux operating systems

Course Outcomes:

- Use and identify various art (input output devices) of computer system.
- Explain functions of various parts and function of computer.
- Use Linux operating system and create files and folders.
- Explain Software Hardware Components of Computer system.

Unit-wise Syllabus :

Unit -I

Introduction to computers: Evolution, Characteristics & Capabilities: Classification: Analog, Hybrid, Digital, Micro, Mini, Main and Super, Components of Computer System, Block Diagram, Input Devices, Output Devices, CPU, Only preliminary concept of software, Hardware, Low level Language, High level Language, Compiler and Interpreter, Preliminary idea of Multimedia computers and associated basic components.

Unit-II

Number System: Introduction to decimal, binary, Octal, Hexa Decimal Number Systems and their interventions: Coding: (ASCII, EBCDIC, BCD), Introduction to Primary Memories (RAM, ROM,PROM and EPROM), Preliminary concept of Extended, Expanded and virtual Memory, Registers, Counters, Storage Devices: Hard Disks, Floppy disks (sector, cylinder, track, seek, time, latency and response time)

Unit -III

Introduction to Operating Systems: Definition, function, Evolution: (Only preliminary idea of terms: Batch processing, multiprogramming, multiprocessing, multitasking, time sharing, on-line processing, real time and some popular operating Systems for PC's):Introduction to DOS: Internal Commands, external commands (Tree, Diskcopy, Undelete, chkdsk, Fdisk, Backup, Restore, Format, Unformat, Attrib, Xcopy, Diskcomp): Concept of wild cards, batch files, config files, filtering, piping and redirection.

Unit -IV

Unix: Structure of UNIX system, Kernel, Unix file system: Concept of files and directories : File Oriented Commands like cat, cp, grep, pwd, chmod, mv, rm, pg, passwd, bc; File permissions, Directory oriented commands like ls, mkdir, inter-user communication commands like write, mail, mesg, General utilities commands like echo, cut, passwd, kill, date, we, sleep, who, ps, Introduction to vi editor.

Unit -V

Windows: Introduction, windows desktop, start button, taskbar, switching between programs and windows, managing files, folders and objects, windows explorer, creating shortcuts, control panel, windows accessories:-paintbrush, WordPad, customizing windows, sharing information among applications, network neighborhood, sharing folders and printers, Internet Explorer.

REFERENCE BOOKS:

1 Jain Satish: Introduction to Computer Science, BPB
2 Sinha, P.K.: Computer Fundamental, BPB
3 Thomas R: Dos 6 and 6.2 Instant reference, BPB
4 Koparker, P. K.: UNIX for you, TMH
5 Alan Simpson's: Easy Guide to Windows, BPB
6 Yashwant Kanetkar "Unix Shell Programming" BPB Publications

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PGDCA102 (A) -PROGRAMMING IN C

Course Objectives:

- To Make the Student Learna C Programming Language.
- To Learn Problem Solving Techniques using C.
- To Teach the Student to Write Programs in C and to Solve the Problems.
- To Teach the Concepts of C Programming Like Control Structures Functions Learn About Arrays Structures and Union etc.

Course Expected Outcome:

- Explain the Basic Terminology Used in Computer Programming.
- Explain the Process of Problem Solving Using C Programming Language.
- Write Compile and Debug Programs in C Language.
- Analyze and Solve Complex and Real Life Problems by Developing Application Programs using C Programming Language.

Unit-wise Syllabus :

UNIT-I

C Language Programming: Principal of good programming (flowchart, algorithm), Introduction to C language: The structure of a simple program: Simple I/O functions (Scanf, printf, gets, puts, getchar, getche, getch). Use of semicolon, braces, parentheses, Comments and newline character: Data types in C, Assignment statement, Arithmetic, Relational & Logical operators: Conditional operators, Precedence of operators.

UNIT- II

Control Structure: The if-else statements, nesting of if-else, switch statement, Loops: while and do-while, the for loop, Functions: User defined functions, Returning a value from a function, Local and Global variables, Storage classes, Parameters, Type declaration of a function, Functions with more than one parameters, Prototype of a function.

UNIT- III

Arrays: Declaration and Initialization, the break and continue statement, String and Character arrays, operations with arrays, searching in array (linear and binary), Sorting an array (Bubble, Selection and Insertion). String & String functions: sprint, strcpy, scanf, strcat, strlen, malloc, sizeof, strcmp.

UNIT- IV

Pointers: The concept of pointers, passing pointers as parameters, arrays of pointers, Pointer to pointers, Array of pointers to string, Sorting an array, using pointers, Structure: The concept of structure, Initializing, Arrays of structures, Arrays within structures, Structures within Structures. Passing structures to function, unions, basic graphics functions in Turbo C.

UNIT- V

Files: Files in C, Modes for files; Functions used in files (getc, putc, fopen, fclose, fscanf, fread, fwrite, fprintf, fseek, ftell, rewind). Text vs binary files, The C Preprocessor: Preliminaries of C Preprocessor Directives (#define, #undef, #include, #ifdef, #ifndef, #endif, #else, #if), Bitwise Operators.

Reference Books:

1. Gottfried, Programming with C. TMH
2. Rajaraman, Introduction to C, PHI
3. Kerninghan & Ritchie “The C Programming Language” PHI
4. Schildt “C: the Complete Reference” 4th Ed. TMH.
5. Kanetkar Y. “Let Us C” BPB.
6. Kanetkar Y. "Exploring in C", BPB.

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PGDCA102 (B) - MULTIMEDIA APPLICATION

Course Objectives:

- To Provide Students with a Basic Understanding of Multimedia Systems and its Components. This Course Focuses on Topics in Multimedia Information Representation and Multimedia Standards in the Components of Multimedia – Text, Audio, Image, Video and Animation.
- To Provide Information about the Standards Tools and Techniques Used in Development of Multimedia Components for Productions
- To Create Simple Multimedia Applications and Products for Using Standalone, Networked Or Web Based Computers.

Course Outcomes:

- Develop Understanding of Technical Aspect of Multimedia Systems.
- Understand and explain the storage mechanism and applicability of Various File Formats for Audio, Video and Text Media.
- Develop Various Multimedia Systems Applicable in Real Time.
- Create a Multimedia Component Using Various Tools and Techniques.
- Apply the Guidelines and Standards of Multimedia Systems and to Analyze the performance of Multimedia System.

Unit-wise Syllabus :

UNIT-I

Introduction to Multimedia, Needs and Areas of use, Development Platforms for Multimedia Identifying Multimedia Elements Text, Images, Sound, Animation and Video, Making Simple Multimedia with PowerPoint.
Concepts of Plain & Formatted Text, RTF& HTML Texts, Using Common Text Preparation Tools, Conversion to and from of Various Text Formats, Using Standard Software, Object Linking and Embedding Concept.

UNIT-II

Sound - Sound and its Attributes, Sound and its Effects in Multimedia, Frequency, Sound Depth, Channels and its Effects on Quality and Storage, Size Estimation of Space of a Sound File, Sound Card Standard – FM Synthesis Cards, Waves Table Cards, Midi and MP3 Files and Devices, 3D Sounds, Recording and Editing Sound Using Sound Editors Like Audacity, Sound Forge etc.

Importance of Images Graphics in Multimedia, Vector and Raster Graphics, Regular Graphics Vs. Interlaced Graphics, Image Capturing Methods - Scanner, Digital Camera etc. Color Models-RGB, CYMK, HUE, Saturation, and Brightness, Various Attributes of Images Size, Color, Depth etc, Various Image File Format BMP, DIB, CIF, PIC, and TIF Format Their Features and Limitations, Image Format Conversion, Various Effects on Images. Create Images Using Photoshop, Corel draw and Apply Various Effects, Using Layers, Channels and Masks in Images.

UNIT-III

Video- Basic of Video, Analog and Digital Video Type of Video, Digitization of Analog Video, Video Standard – NTSC, PAL, HDTV, Video Capturing Media /Instruments Videodisk Camcorder Compression Techniques, File Formats AVI, JPG, MPEG, Video Editing and Movie Making Tools, Converting Formats of Videos, Recording and Editing Videos Using Video Editing Software Like Adobe Premiere or Sony Vegas.

UNIT-IV

Animation and its Basic – Principals of Animation and its use in Multimedia, Computer System Configuration and Peripherals Requirements, Software for Animation, Effects of Resolution, Pixel Depth, Image Size, on Quality and Storage, Types of Animation and Applications.

Authoring Tools for Multimedia – Introduction to Various Types of Multimedia Authoring Tools, CD/DVD Based and Web Based Tools, Features and Limitations, Creating Multimedia Package Using All Components.

UNIT-V

Introduction to Virtual Reality and its Applications, Virtual Reality Terminology Head Mounts Display (HMD), Boom, Cave, Input Devices and Sensual Technology, Characteristic If Immersive vs. Shared, Augmented and Mixed Reality

Reference Books:

1 Ramesh Bangia-Introduction to Multimedia-Laxmi Publications Pvt. Ltd.

2 Tay Vaughan-Multimedia: Making It Work,TataMc-Graw Hill.

3 Bhatnager G. Elsevie-,Introduction to Multimedia Systems,

4 Satish Jain O Level Introduction to Multimedia (M4.2-R4), BPB Publications.

PGDCA 103(A) ANALYSIS AND DESIGN OF INFORMATION SYSTEM

Course Objectives:

- Understand System Characteristics, Components, Managing Projects, Prototyping.
- Introduce Established and Evolving Methodologies for the Analysis, Design, and Development of an Information System.
- Understand and Learn System Development Life Cycle (SDLC) Phases.
- Learn and Apply the Universal Modeling Language (UML) to Model the System.
- Learn and Inculcate the Technical and Soft Skills Required to System Analysts for Broad Understandings Policies, Culture, Operations and Business Processes of the Organization

Course Outcomes:

- Explain the Characteristics, Components, Activities of SDLC, Models of Information Systems, Types of Information Systems and Benefits of Various Information Systems
- Identify, Analyze, Review and Validate the Requirement of Information System and Also Prepare System Requirement Specification (SRS) Document.
- Design, Develop/Implement, Deploy and Evolve the Efficient, Reliable, Robust, and Cost Effective Information System.
- Apply Universal Modeling Language (UML) to Analyze and Model the Solutions of Information System Problems
- Work Effectively in Various Roles of System Analyst Such as Problem Investigator, Communicators, System Designer, Tester, Project Manager and Maintenance Engineer.

Unit-wise Syllabus:

UNIT-I

Organizational Foundation of IS: Historical Evolution of Information system. The completive Business Environment. Advantages of Using Computerized information System (IS) Six major types of Information System. The changing matter of Information Technology, Challenges of Information systems, Relationship between Organisation and Information systems. Salient Features of Organization and management. Classical Model. Behavioral Model and Decision Model. Levels and types of Decision Making. System Approach Theory. Management Challenges. Ethical and Social Impact of Information System.

UNIT-II

Technical Foundation of Information System: Charting Techniques. Structured Analysis and Design. Decision Tree. Decision Table. DFD. Data Dictionary. Information System Software Tools and Approaches: Advantages and disadvantages of using IS Software tools. Idea of Object Oriented Programming. CASE tool, PERT & CPM. Recent Database Management trends. Distributed Databases: Object Oriented and Hypermedia Database, Telecommunications. The Internet.

UNIT-III

Building Information System Traditional Si stem Development Life Cycle (SDLC). Analysis: Problem Identification. Fact Gathering, Fact Analysis, Feasibility Study, Feasibility report. Design, Physical and Logical Design. File Design. I/o Design, Database Design. Limitation of traditional life cycle approach. Prototyping, Outsourcing information system. A Typical Case Studs of Information System.

UNIT-IV

Implementation: Managing and Controlling of Information System. testing, training, conversion. Post Implementation phase. Ensuring quality with IS. Traditional tool & methodology for quality assurance. New approaches to quality assurance. Measuring Information System Success. Areas of Problem in Information System. Causes of Information system Success and Failure. Controlling Risk Factor. Auditing Information

System.

UNIT-V

Management and Organizational Support Systems: Knowledge Work System. Decision Support System (DSS). Group Decision Support System (GDSS). Executive Support System (ESS). Artificial Intelligence (Al). Expert System. Neural Network. Growth of International Information System. Main Technological Issues: Merger of International Technology and Infrastructure.

Reference Books:

1. Lauden C. Kennieth & Lauden P. Jane: Management Information System: Organization Technique. PHI.
2. Awad E. M.: Systems Analysis and Design. Galgotia Pub.
3. Murdic. Ross. Clagett : Information Systems for Modern Management.
4. PHI Bhatnagar S. C.: Computer & Information Management. PHI.

Approved by Board of studies dated 21-09-2020

PGDCA-103(B) E-COMMERCE AND E-GOVERNANCE

Course Objectives:

- To Develop Skills in Understanding Strategic Issues Related to E- Commerce and E- Governance
- To Develop a Broad Knowledge of E-Governance and E-Commerce Activities in India
- To Understand the Electronic Payment Systems
- To Develop Knowledge of How the Government May Contribute in Moving the Country Towards E-Commerce and E- Governance

Course Outcome:

- Explain and demonstrate E-Governance Initiatives at the National Level in India
- Make Classification of E-Commerce and E- Governance
- Students Able to Think Critically and Analytically to New Successful Business Ideas.

Unit-wise Syllabus :

UNIT-I

Introduction to E-Commerce: Definition, History of E-Commerce, E-Business Models B2B, B2C, C2C, C2B, Environment of E-Commerce, Dimensions of E-Commerce, Ethical Issues, Electronic Data Interchange, Value Chain and Supply Chain, E-Commerce Marketing, E-Commerce Strategy, E-Commerce Infrastructure, Advantages and Disadvantages of E-Commerce.

UNIT- II

Electronic Payment Systems: Payment Gateways, Payment Cards, Credit Cards, Debit Cards, Smart Cards, E-Credit Accounts, E-Money, Marketing on the Web, Categories of E-Commerce, Edi, Marketing Strategies, Advertising on the Web, Customer Service and Support, Internet Banking, Introduction to M-Commerce, Case Study: E-Commerce in Passenger Air Transport, Element of E-Commerce, Issues of E-Commerce

UNIT- III

E-Government, Theoretical Background of E-Governance, Issues in E -Governance Applications, Evolution of E-Governance, its Scope and Content, Benefits and Reasons for the Introduction of E-Governance, E-Governance Models - Broadcasting, Critical Flow, Comparative Analysis, Mobilization and Lobbying, Interactive Services / G2C,C2G

UNIT- IV

E-Readiness, E-Government Readiness, E- Framework, Step & Issues, Application of Data Warehousing and Data Mining in E-Government, Case Studies: NICNET-Role of Nationwide Networking in E-Governance, E-Seva. Origins in India E-Governance Projects in India Measures to Be Considered Before Going for E-Governance, Work plan and Infrastructure

UNIT- V

E-Government Systems Security: Challenges and Approach to Security of E-Government, Security Concern in E-Commerce, Security for Server Computers, Communication Channel Security, Security for Client Computers. E-Security Network and Web Site Risk for E-Business, Information Technology ACT 2000 and its Highlights Related to E-Commerce, E-Security, Firewalls, Electronic Market / E- Shop, Introduction to Security, Types of Securities, Security Tools, Network Security.

Reference Books

1. Gary P. Schneider, “E-Commerce”, Cengage Learning India.
2. C.S.R. Prabhu, “E-Governence: Concept and Case Study”, PHI Learning Private Limited.
3. P. Tjoseph, S.J.,“E-Commerce an Indian Perspective”, Prentice-Hall of India.
4. V. Rajaraamn, “Essentials of E-Commerce Technology”, PHI Learning Private Limited.

Approved by Board of studies dated 21-09-2020

PGDCA-104 OFFICE AUTOMATION S/W TOOLS

Course Objectives:

- To provide an in-Depth Training in use of office Automation Packages.
- To Understand the Basics of Windows Operating Systems
- To Understand How to use Software Packages in Day to Day Activities

Course Outcome:

- Creating Word Documents for office use Knowledge of Mail Merge.
- Use of Formatting Techniques and Presentation Styles.
- Provide Professional Services to the Society.
- Create Presentation Using Animation and Transition and other features.
- Construct Formulas Including the use of Built-in Functions and Relative and Absolute References and Create and Modify Charts and Preview and Print Worksheets.

Unit-wise Syllabus :

UNIT – I

Office Packages-Office activates and their software requirements, Word-processing, Spreadsheet, Presentation graphics, Database, introduction and comparison of various office suites like MS Office, Lotus Office, Star Office, Open Office etc. MS Word Basics: Introduction to MS Office; Introduction to MSWord; Features & area of use. Working with MS word.; Menus & Commands; Toolbars & Buttons; Shortcut Menus, Wizards & Templates; Creating a New Document; Different Page Views and layouts; Applying various Text Enhancements; Working with – Styles, Text Attributes; Paragraph and Page Formatting; Text Editing using various features ; Bullets, Numbering, Auto formatting, Printing & various print options.

UNIT-II

Advanced Features of MS-Word: Spell Check, Thesaurus, Find & Replace; Headers & Footers ; Inserting – Page Numbers, Pictures, Files, Auto texts, Symbols etc.; Working with Columns, Tabs & Indents; Creation & Working with Tables including conversion to and from text; Margins & Space management in Document; Adding references and Graphics; Mail Merge, Envelops & Mailing Labels. Importing and exporting to and from various formats, an overview of Google Doc.

UNIT-III

MS Excel: Introduction and area of use; Working with MS Excel.; concepts of Workbook & Worksheets; Using Wizards; Various Data Types; Using different features with Data, Cell and Texts; Inserting, Removing & Resizing of Columns & Rows; Working with Data & Ranges; Different Views of Worksheets; Column Freezing, Labels, Hiding, Splitting etc.; Using different features with Data and Text; Use of Formulas, Calculations & Functions; Cell Formatting including Borders & Shading; Working with Different Chart Types; Printing of Workbook & Worksheets with various options, an overview of Google sheet.

UNIT-IV

MS PowerPoint: Introduction & area of use; Working with MS PowerPoint; Creating a New Presentation; Working with Presentation; Using Wizards; Slides & its different views; Inserting, Deleting and Copying of Slides; Working with Notes, Handouts, Columns & Lists; Adding Graphics, Sounds and Movies to a Slide; Working with PowerPoint Objects; Designing & Presentation of a Slide Show; Printing Presentations, Notes, Handouts with print options. Outlook Express: Features and uses, Configuring and using Outlook Express for accessing e-mails in office, an overview of Google Slide.

UNIT-V

MS ACCESS: Creating of databases. tables, froms, reports & queries, use of macro & modules, creating of relationships among tables, generating simple queries using databases. MS-Access with other applications and Internet, sharing data between applications, Administering & securing a database. an overview of Google Form.

Reference Books:

1. Mansfield R: The Compact Guide to MS-OFFICE, BPB
2. Murray: Mastering Poser Point 6.0 for Windows, BPB
3. Cowart: ABC's of MS-ACCESS, BPB
4. Ms Office XP Complete BPB Publication

Approved by Board of studies dated 21-09-2020

PGDCA-105 Software LAB I (Problem based on Paper 102)

Course Objectives:

- To Provide the Knowledge of Programming Language to Students.
- To Prepare Students for Role of Professional Programmers.
- To Learn About Programming Methodology, Concepts of C Programming Like Control Structures, Functions, Learn About Arrays, Structures, and Union etc.

Course Outcome:

- Analyze the Problem and Write, Compile and Execute the Program and Verify the Outcome
- Explain and apply a Various features of IDE of C / C++ Compiler .
- Read, Understand and Trace the Execution of Programs Written in C language.
- Write the C Code for a Given Algorithm Using Coding Guidelines .
- Implement Programs with Pointers and Arrays to Manage the Memory.

C Programming Lab:

1 Write a Program in C to Calculate Simple Interest When the Values of Principal, Rate and Time are given.
2 Write a Program in C to Calculate Area of a Circle When its Radius is Input from Keyboard.
3 Write a Program in C to Calculate Temperature in Centigrade When Temperature in Fahrenheit is Input from Keyboard.
4 Write a Program in C to Calculate Area of a Triangle When its Three Sides are Input from Keyboard (by Hero's Formula).
5 Write a Program in C to Determine Whether an Input Year is Leap Year Or Not.
6 Write a Program in C to Display the Table of a Number Input from Keyboard in the Following Format:
N X 1 = N
Eg: 5 X 1 = 5
i. 5 X 2 = 10
7 Write a Program in C to Display the Table of Tables from 1 to 10.
8 Write a Program in C to Display the Following Patterns
9 Write a Program to Calculate the Factorial of a Number Input from Keyboard Using Recursive Method.
10 Write a Program in C to Show How to Pass an Array to a User Defined Function.
11 Write a Program in C to Display Largest Element of an Array When the Elements of the Array are Input from Keyboard.
12 Write a Program in C to Calculate Area of a Circle in a User Defined Function.
13 Write a Program in C to Swap Two Numbers Using Call By Value and Call By Address.
14 Write a Program in C to Show How to Pass an Structure to a User Defined Function.
15 Write a Program in C to Show How to Pass an Structure to a User Defined Function.
16 Write a Program to Calculate Total Marks, Percentage and Grade of a Student. Marks Obtained in Each of the Five Subjects are to Be Input by the User. Assign Grades According to the Following Criteria:
a. Grade a: Percentage >=80 Grade B: Percentage>=70 and <80
b. Grade C: Percentage>=60 and <70 Grade D: Percentage>=40 and <60
c. Grade E: Percentage<40
17 Write a Menu-Driven Program, Using User-Defined Functions to Find the Area of Rectangle, Square, Circle and Triangle by Accepting Suitable Input Parameters from User.
18 Write a Program in C to Display the First N Terms of Fibonacci Series.
19 Write a Program in C to Calculate the Sum of Two Compatible Matrices.
20 Write a Program in C to Calculate the Product of Two Compatible Matrices.

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PGDCA-106- Software LAB II (Problem based on Paper 101 & 104)

Course Objectives:

- To Provide the Knowledge of Microsoft Office Package.
- To Prepare Students to makeuse ofMs-Office Package Professionally.
- To Learn About Word Processing, Ms Excel, Power Point Presentation etc.

Course Objectives

- Use Microsoft Office Programs to Create Personal, Academic and Business Documents Using CurrentProfessional and/or Industry Standards.
- Perform Calculations in Microsoft Excel Using Formulas and Built-in Functions.
- Prepare Datasheet and Graphs to Describe and analyze the Data in MicrosoftExcel.
- Create Effective Presentation Using Various Features of MsPowerPoint

Experiment on Windows

1 Starting the Windows, Starting a Program, Running a Program Running Multiple Programs and Switching Between Windows, Customizing the Task BarRecycle Bin, Restoring the Deleted Files

2 Creating and Removing Folders, Making the Taskbar Wider, Arranging Icons on the Desktop Displaying and Hiding the Taskbar Clock, Controlling the Size of Start Menu Options, Creating Shortcuts.

3 Installing a Screen Saver, Assigning a Wallpaper to Desktop, Adding a Program to the Start Menu, Adding a Program Shortcut in the Desktop, Customizing the Mouse Settings. Expanding and Collapsing a Folder, Recognizing File Types Using Icons, Running a Program fromExplorer, Renaming a File or Folder, Sorting a Folder

4 Displaying the Properties for a File or Folder, Using Cut and Paste Operations to Move a File Using Copy and Paste Operations to Copy a File, Moving and Copying Files with Mouse, Searching a File or Folder by Using Search Command, Finding a File or Folder, by Name Defragmenting the Disk, Using Disk Defragmenter, Controlling the Speaker Volume Recording and Saving an Audio File, Connecting a Printer to the Pc

Experiment on Word Processing:

1 Type the Following Paragraph as Given.

"My Dream Career"

My Ambition of Life is to Become a Doctor. I Have Taken Up Science and Hygiene as Optional Subjects. When I Joint College, I Shall Take UP Medical Group. I Shall Appear in the P.M.T. Examination to Qualify for Joining a Medical College. After Passing the P.M.T., I Shall Join the Medical College to Become a Doctor.
I Would Like to Be a Doctor. My Country Has Become Free from Diseases, Government Has Decided to Uproot the Diseases from the Country and Improve the Health of the People. Hospitals are Being Opened for This Purpose. There is Great Demand for Doctor. Taking All These Things into Consideration I Have Made Up Mind to Become a Doctor.
I Do Not Want to Be Clerk. This Line Does Not Suit Me. I Do Not Want to Be a Teacher. Law is Not a Paying Profession These Days So Becoming Lawyer is Not My Goal.

2. Correct any Spelling Errors Displayed in the Given Text.
3. Save the Document as <My Dream >_W01.
4. Change the Layout of the Page as Given Below.

>Page Size: A4 (8.27″ X 11.69″) >Page Orientation: Landscape.

5. Change the Page Margins as Follows:

>Top: 1.25″>Bottom: 1.25″>Right: 1.25″>Left: 1.25″

6. Format the Entire Document as Given Below.

>Line Spacing: 1.15">Font: Times New Roman >Font Size: 14

>Align: Justify

7. Select the Heading “Academy Award” and Format It as Given Below.
>Font Color: Blue >Style: Bold and Underline >Align: Center
>Change All the Letters to Uppercase

8. Make the First Letter of the Paragraph Larger and Fallinto Three Lines (Drop Cap).

9. Format the Heading “My Dream Career” with Style: Heading 2.

10. Create a Bulleted List for the Last Paragraph Lines of Document.

11. Enter “My Document Tutorial” Text as the Heading of the Table and Format It to Get the Following Output Using a Word Art. (Font: Arial Black, Font Size: 16, Align: Center)

12. Insert Footer with the Following Formatting Options.

>Caption: <My First Document>>Font: Times New Roman >Font Size: 12

13. Insert the W01 Image Given in the "Resources" Directory, to the Right Hand Side of the Bulleted List of the Document.

14. Prepare Your Class Time Table Using and Format the Entire Table as Given Below.

Change the Cell Size of the Table to Auto Fit to Contents. >Align: Center

15. Select the Heading Row and Format It as Given Below.

Convert All Text in to Capital Letters >Style: Bold >Align: Center

16. Insert a New Row Just Below the Last Row of the Table and Enter the Following Information into the New

Row: >Saturday: Special Lecture on Cloud Computing > Merging All the Column.

17. Send a Call Letter for All Applicants to Inform Interview Details Using Mail Merge Base

18. Preparing a Govt. Order / official Letter / Business Letter / Circular Letter

Covering Formatting Commands - Font Size and Styles - Bold, Underline, Upper Case, Lower Case, Superscript, Subscript, Indenting Paragraphs, Spacing Between Lines and Characters, Tab Settings etc.

19. Preparing a News Letter:

To Prepare a Newsletter with Borders, Two Columns Text, Header and Footer and Inserting a Graphic Image and Page Layout.

20. Creating and Using Styles and Templates

21To Create a Style and Apply That Style in a Document

22 To Create a Template for the Styles Created and Assemble the Styles for the Template.

Spreadsheet Experiment:

1. Create a Blank Spreadsheet in and Save It as "<Your Index No>_E01".
2. Create a Table with 7 Rows and 8 Columns in the Cell Range A3:H9.
3. Insert a Title “Vivekananda College " and a Sub Title "Mark Sheet for a/L Biology- Class a", by Centering It with the Table, Making the Text Bold, and Changing the Font Size 16 for Main Title and 14 for Subtitle.
4. Enter Data of 6 Students Under the Columns, "Roll No", "Name", "Physics", "Chemistry", "Biology", and "English".
5. Use the Relevant Formula to Calculate the Total Marks and Average and Copy the Formula to the Relevant Cells.
6. Format the "Average" Column with Two Decimal Places.
7. Use Conditional Formatting to Change the Color of the Cells of Which the Average Mark is More Than 60, into Green.
8. Select the Columns, "Roll No", "Physics", "Chemistry", "Biology", and "English" Column and Draw a Column Chart.
9. Insert the Title, "Vivekananda College ", and the Sub Title, "Mark Sheet for a/L Biology - Class a" to the Top of the Chart.
10. Set the X Axis Labels with the Index Numbers.
11. Label the X Axis Title as, "Roll No" and Y Axis Title as, "Marks".
12. Label the Legends for 4 Subjects, "Physics", "Chemistry", "Biology" and "English".
13. Make Sure to Get a Graph Similar to the One Given Below.
14. Sorting Data, Filtering Data and Creation of Pivot Tables.
15. Operating on the Sheets: Finding, Deleting and Adding Records, Formatting Columns, Row Height, Merging, Splitting Columns etc. Connecting the Worksheets and Enter the Data.

Presentation Experiments

1. Create a Presentation with Four Blank Slides.
    - Modify the Presentation as Follows.
    - Insert a Suitable Design Template.
    - Insert a Footer to Show Your Name and Your Student Id.
    - Insert Today’s Date as a Fixed Date in the Date Area.
    - Make Necessary Changes to Appear Slide Numbers in the Slide Number Area.
    - Make Necessary Changes So That the Footer, Date and the Slide Number Do Not Appear on the Title Slide (First Slide).
    - Add Content to the Title Slide (First Slide) by Following the Instruction Given Below.
    - Type "River” as the Slide Title and It’s Format Should Be Font Type: Arial, Style: Bold, Size:96, Color: Black
    - Type “Our Life Support” as the Sub Title and Insert an Image from the Resources Directory to a Suitable Location.

- Add Content to the Second Slide by Following the Instruction Given Below.

- Type the Slide Title as, "Rivers of North India" and Format It as, Font Type: Arial, Style: Bold, Size: 44, Color: Black

2. Insert the Following Content as Shown Below.
    - The Ganga
    - The Indus
    - The Brahmaputra
    - In the Third Slide, Add the Following Components.
    - Type the Slide Title as, "Tributaries"
    - Insert Rivers and Their Tributaries of Slide 2 in a Table.
    - Insert Few More Important Rivers of India with Their Regions.
    - Add the Following Animation Effects to Your Presentation.
    - Apply Emphasis Animation Effect to Each Main Point and Sub Point in the Second Slide.
    - Apply Sound Effect When the Second Slide Appears in the Slideshow.
    - Hide the Fourth Slide from the Slide Show.
    - Save Your Presentation with the Following File Name <Rivers of _North India>_ P01. Next Practicals
3. Creating a New Presentation Based on a Template – Using Auto Content Wizard, Design Template and Plain Blank Presentation.

Operating System

4. Discuss all Internal and external commands of DOS with suitable example.
5. Discuss all Unix/Linux commands with suitable example.

II Semester
PGDCA 201(A)– JAVA PROGRAMMING

Course Objectives:

- Introduce and Learn the Usage of the Java SDK Environment to Create, Debug and Run Java Programs.
- Understand Fundamentals of Java Programming Such as Character Set, Variables, Data Types, and Control Structures, Array, Class and Methods.
- Understand the Concepts of (OOPs) and Learn Implementation in Java Defining Classes, Invoking Methods, Using Class Libraries.
- Introduce Strings, Vectors, Interfaces, Packages and Threads Handling in Java. Gain the Knowledge of Java Applets, AWT, Swings, Servelet.

Course Outcomes :

- Explain and Apply the Object Oriented Concepts for Solving Real Problem.
- Use the Java SDK Environment to Create, Debug and Run Simple Java Programs.
- Apply Java Technology to Develop the Small Applications, Utilities, and Web Applications.
- Apply Events Management and Layout Managers Using AWT, Swing, JDBC and Servlet for Developing the Software for Various Problems.

Unit-wise Syllabus :

UNIT-I

Introduction to Object Oriented Programming: Basic concepts, benefits of OOPS, Application of OOP. Java evolution: history, features, C, C+ + & Java a comparison. Java and WWW, HW & SW requirements for Java, Structure of simple Java program, Java tokens, statements, Java virtual machine, Command line arguments, programming style. constants & variables, symbolic constants, type casting: Various operators in Java (arithmetic, relational, logical, assignment, increment decrement, conditional, bitwise & special operator): arithmetic expressions & their evaluation, precedence of arithmetic operators, type conversations in expressions, operator precedence and associatively, mathematical functions.

UNIT-II

Decision making and branching: Decision making with if statement, simple if statement, the if ... else statement, nesting of if .....else statements, the else if Ladder, the switch statement. The ? operators, the while statement, the do statement, the do statement, the for statement, jump in loops, labeled loops, classes, objects and methods; Defining a class, objects and methods: Defining a class, adding variables and methods, creating objects, accessing class members, constructors, method overloading. Static members, nesting of methods inheritance: extending a class, overriding methods, final variables and methods, final classes, finalize methods, abstract methods and classes visibility control.

UNIT-III

Arrays, strings and vectors: Arrays, one dimensional arrays, creating an array, two dimensional arrays. Strings, Vectors, Wrapper classes, defining interfaces, multiple inheritance, extending interfaces, implementing interfaces, accessing interface variable. Packages: Java API packages, using system packages, naming conventions, creating packages, accessing a package, using a package, adding a class to a package, hiding classes

UNIT-IV

Exception Handling & Multithreading: Exception Handling: Introduction to Exception Handling, Try-Catch, Finally, Throws. Multithreading Programming: Creating threads, extending the thread class stopping and

blocking a thread, life cycle of a thread, using thread methods, thread exceptions thread priority, Synchronization, implementing the runnable interface, thrashing, other consideration, demand segmentation.

UNIT-V

Applet programming: Local and remote applets, how applets differ from applications, preparing to write applets, building applets code, applet life cycle, creating an executable applet, designing a web page, adding applet to HTML file, running the applet, More about applet tag, passing parameters to applets. aligning the display more about HTML tags, displaying numerical values, getting input from the user. AWT Classes, Swing Classes, Event Handling, AWT Programming: Working with Windows, Graphics and Text, Using AWT Controls, Layout Managers and Menus, Handling Image, Animation, Sound and Video. Java Swing: Japplet, Icons and Labels, Text Fields, Buttons, Radio Buttons, Check Boxes, Combo Boxes, List Boxes, Tabbed and Scroll Panes, Tables. Event Handling:

Reference Books:

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1. E. Balagurusamy, "Programming with Java, a Primer",TMH, ISBN-13: 978-0-07-061713-1, ISBN-10: 0-07-061713-9.
2. Patrick Naughton and Herbert Schildt, "Java: the Complete Reference", TMH Publication, ISBN 0-07-463769-X.
3. Yashavant kanetkar, "Let us Java", BPB Publications.
4. Ivan Bayross, "Web Enabled Commercial Application Development Using HTML, DHTML, Javascript, Perl CGI",BPB Publications
5. Mastering in java, Techmedia Pub.schatz & Galvin
6. CoreJAVA 2 Volume- l Fundamentals sun Microsystems

PGDCA-201 (B) -WEB TECHNOLOGY

Course Objectives:

- Learn How to Design and Develop a Web Page Using HTML and CSS
- Learn How to Link Pages So that they Create a Web Site.
- Design and Develop a Web Site Using Text Images Links Lists and Tables for Navigation and Layout.
- Style Your Page Using CSS Internal Style Sheets and External Style Sheets.
- Learn to use Java Script & XML in Web Design.
- Learn How to use Database in Web Design.

Course Outcome:

- Describe the concepts of WWW including Browser and HTTP Protocol.
- ListtheVariousHTMLTagsandusethemtodeveloptheUserFriendlyWebPages.
- Define the CSS with its Types and use them to provide the Styles to the Web Pages at Various Levels.
- DeveloptheModernWebPagesusingtheHTMLandCSSFeatureswithdifferentlayoutsas per Need of Applications.
- Use the Java script to develop the dynamic WebPages.
- Use Server Side Scripting with PHP to Generate the Web Pages dynamically using the Database Connectivity.
- Develop the Modern Web Applications using the Client and Server Side Technologies and the Web Design Fundamentals.

Unit-wise Syllabus :

UNIT-I

Introduction to Web Web Designing and Website Planning :concept of WWW Internet and WWW HTTP Protocol : Request and Response Web Browser and Web Servers Website Hosting-Free Vs. Paid Linux Vs. Windows Hosting Concepts & use of Database & Mail Servers Associated with Web Sites Features of Web 2.0 Concepts of Effective Web Design Web Design Issues Including Browser Bandwidth and Cache Display Resolution Look and Feel of the Website Page Layout and Linking User Centric Design Sitemap Planning and Publishing Website Designing Effective Navigation. Website Hosting Issues C panel and FTP.

UNIT-II

Web Development with HTML : Basics of HTML Formatting and Fonts Commenting Code Color Hyperlink Lists Tables Images Forms Meta Tags Character Entities Frames and Frame Sets Browser Architecture and Web Site Structure. Overview and Features of HTML5 use of HTML Code Editor& WYSIWYG Editor. Cascading Style Sheets (CSS): Style Sheets : Need for CSS Introduction to CSS Basic Syntax and Structure Using CSS Background Images Colors and Properties Manipulating Texts Using Fonts Borders and Boxes Margins Padding Lists Positioning Using CSS CSS2 Overview and Features of CSS3.

UNIT-III

Technologies for Web Applications Javascript & XML: Javascript : Client Side Scripting with Javascript Variables Functions Conditions Loops and Repetition Pop Up Boxes Advance Javascript: Javascript and Objects Javascript Own Objects the Dom and Web Browser Environments Manipulation Using Dom Forms and Validations DHTML : Combining HTML, CSS and Javascript Events and Buttons. XML : Introduction of XML Validation of XML Documents DTD Ways to use XML, XML for Data Files Html Vs XML Embedding XML into HTML Documents Converting XML to HTML for Display Displaying XML Using

CSS and XSL Rewriting HTML as XML Relationship Between HTML SGML and XML Web Personalization Semantic Web Semantic Web Services. Transforming XML Using XSL and XSLT

UNIT-IV

Web Design with PHP: Introduction and Basic Syntax of PHP Decision and Looping with Examples PHP and HTML Arrays Functions Browser Control and Detection String Form Processing Files Advance Features: Cookies and Sessions Object Oriented Programming with PHP.

UNIT-V

Introduction to Database Driven Websites with PHP: PHP and MYSQL: Basic Commands with PHP Examples Connection to Server Creating Database Selecting a Database Listing Database Listing Table Names Creating a Table Inserting Data Altering Tables Queries Deleting Database Deleting Data and Tables PHP My admin and Database Bugs.

Reference Books:

1. Roger S. Pressman David Lowe "Web Engineering" Tata McGraw Hill Publication 2007
2. Achyut S Godbole and Atul Kahate "Web Technologies" Tata McGraw Hill
3. Gopalan N P Akilandeswari "Web Technology: a Developer S Perspective" PHI
4. Chris Bates Web Programming: Building Internet Applications Wiley
5. C. Xavier "Web Technology & Design" Tata McGraw Hill.
6. Ivan Bay Ross "HTML DHTML Java Script Perl CGI" BPB.
7. Ralph Moseley and M.T. Savaliya- Developing Web Applications Wiley-India
8. Web Technologies Black Book Dreamtech Press
9. HTML5 Black Book Dreamtech Press
10. Joel Sklar- Web Design Cengage Learning
11. Harwani- Developing Web Applications in PHP and Ajax Mcgrawhill
12. P.J. Deitel & H.M. Deitel- Internet and WorldWideWeb How to Program Pearson

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PGDCA202 (A)-COMPUTER NETWORKS

Course Objectives:

- Build an Understanding of the Fundamental Concepts of Computer Networking.
- Familiarize the Student with the Basic Taxonomy and Terminology of the Computer Networking Area.
- Introduce the Student to Advanced Networking Concepts Preparing the Student for Entry Advanced Courses in Computer Networking.

Course Outcome:

- Demonstrate the Basic Concepts of Networking, Networking Principles Routing Algorithms IP Addressing and Working of Networking Devices.
- Demonstrate the Significance Purpose and application of Networking Protocols and Standards.
- Describe compare and contrast LAN WAN MAN Intranet Internet AM FM PM and Various Switching Techniques.
- ExplaintheworkingofLayersandapplythevariousprotocolsofOSI&TCP/IPmodel.
- Analyze the Requirements for a Given Organizational Structure and Select the Most Appropriate Networking Architecture and Technologies.

Unit-wise Syllabus :

UNIT-I

Introduction to Computer Networks Types of Network - LAN WAN MAN Internet Network Topologies Transmission Media Communication Mode- Simplex Half Duplex Full Duplex Analog& Digital Signals Base Band Broad Band Error Detection and Correction OSI Model:- Functions of Each Layer Services and Protocols Inter-Networking Devices Hub Repeater Bridge Switch Modem Routers Gateways.

UNIT- II

Multiplexing Multiplexer FDM TDM Statistical Multiplexing Modulation AM FM PM Switching Technique Message Switching Circuit Switching Packet Switching Virtual Circuit IEEE Standards 802.4802.5.FastEthernetFDDITokenRing.

UNIT- III

Rooting Algorithms:- Shortest Path Routing Distance Vector Routing Unicast Routing Multicast Routing Link State Routing Broadcast Routing Congestion Control Traffic Shaping. TCP/IP: IntroductionHistoryofTCP/IPArchitectureLayersofTCP/IPComparisonBetweenOSIandTCP/IP Models Transmission Control Protocol User Datagram Protocol Internet Protocol IP Addressing IP Addressing Classes Internet Protocols–IP Packet ARPRARPICMP

UNIT- IV

Various Protocol HTTP Telnet FTP SMTP Mine UDP URL (Uniform Resource Locater) ISDN Channel ISDN Services Base Band ISDN Broadband ISDN Network Security : Network Security IssuesFirewalls–NeedandFeaturesofFirewallsTypesofFirewallTechnology-NetworkLeveland ApplicationLevelIPPacketsFilterScreeningRoutersLimitationsofFirewalls.

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UNIT- V

Introduction to Wireless Network Fundamentals of Cellular Systems Mobile Ad-Hoc and Sensor Networks Wireless PAN/LAN/MAN Multi-Path Propagation Path Loss Slow Fading Fast Fading Frequency Reuse Cell Splitting Cell Sectoring.

Reference Books

1. AndrewS.Tanenbaum-ComputerNetworksPearson-4thEdition
2. Behrouza.Forouzan-DataCommunicationsandNetworking-GlobalEd-5thEdition
3. William a Shay - Understanding Data Communications and Networks -Course Technology Inc-3rd RevisedEdition
4. PrakashC.Gupta-DataCommunicationsandComputerNetworks-PHI-2ndEdition
5. William Stallings- Data and Computer Communications Pearson Education India 10th Edition
6. LarryL.PetersonandBruceS.Davie-ComputerNetworks–aSystemsApproach-MorganKaufmannPublishers-FifthEdition2011

PGDCA202(B) -BIG DATA ANALYSIS

Course Objectives:

- Familiarize the Students with Most Important Information Technologies used in Manipulating, Storing, and Analyzing Big Data.
- This Course Gives Students all Around Learning of the Big Data Framework using Hadoop and Spark, Including Yarn, HDFS and Map reduce
- It Provide an Overview of Approaches Facilitating Data Analytics on Huge Datasets.

Course Outcome:

- Ability to identify the characteristics of datasets and compare the trivial data and big data for various applications.
- Demonstrate an ability to use Hadoop framework to efficiently store retrieve and process Big Data for Analytics.
- Implement several Data Intensive tasks using the Map Reduce Paradigm

Unit-wise Syllabus :

UNIT-I

Big Data- Introduction, Characteristics, Types, Elements, Traditional vs. Big Data Business Approach, Big Data Analytics, Advantages, Applications, Distributed & Parallel Computing for Big Data, Components in Big Data Architecture, Virtualization Approaches.

UNIT- II

Statistics and Probability: Sampling Techniques - Data Classification, Tabulation, Frequency and Graphic Representation, Measures of Central Value - Mean, Mode, Median, Random Variable and Probability Theory.

UNIT- III

Hadoop- Introduction, Features, Advantages, Versions, Key Considerations of Hadoop, RdbmsVsHadoop, Hadoop Ecosystem, HDFS - Architecture, Features, Commands, Processing Data withHadoop, Hadoop Yarn.

UNIT- IV

Mapreduce Framework, Features, Uses, Working onMapreduce, Mapreduce Input and Output Operations, Exploring Map and Reduce Functions, Mapreduce Optimization Technique, HBASE Introduction, Architecture, HBASE in Hadoop Applications.

UNIT- V

Processing Data withMapreduce, Task Execution & Environment – Installation of Eclipse, Hadoop, Java Development Kit and Linux Ubuntu OS, Mapreduce Program Steps to Obtain Word Count, Functionality of Input Format- Inputsplit, Recordreader, Fileinputformat, Output Process of Fileoutputformat – Outputformat, Recordwriter, Role of Combiner, Partitioner, Debugging Mapreduce.

Reference Books:

1. Rob Kitchin The Data Revolution: Big Data Open Data Data Infrastructures And Their Consequences SAGE Publications Ltd
2. Croll and B. Yoskovitz Lean Analytics: Use Data to Build a Better Startup Faster o'reilly
3. Mayer-Schönberger and K. Cukier Big Data: A Revolution That Will Transform How We Live Work and Think

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PGDCA203 - DATABASE MANAGEMENT SYSTEM (DBMS)

Course Objectives:

- To Understand the Fundamentals of Data Models and Conceptualize and Depict a Database System Using ER Diagram.
- To Make a Study of Relational Database Design.
- To Know about Data Storage Techniques and Query Processing.
- To Acquire the Knowledge of Query Evaluation to Monitor the Performance of the DBMS.
- To Impart Knowledge in Transaction Processing, Concurrency Control Techniques and Recovery Procedures.

Course Outcome:

- Understand and describe the basic concepts and terminology of Database Management System.
- Analyze and Design the database of applications using ERmodeling and Normalization.
- Evaluate business information problem and find out the data requirements of organization.
- Demonstrate the database schema, data modeling and normalization process with the help of example.Implement the database design using appropriate database tools.

Unit-wise Syllabus :

UNIT-I

Basic Concept: An Introduction to database System, Database System Architecture, Purpose of DBMS, Data Independency, Basic File Systems, File Organization: Sequential, Index Sequential, Hosting. B-Tree based index, Sequential File Organization. Detailed Design of E-R Data Model, Security & Integrity: Introduction, Access Control. Crypto Systems, Statistical Data base Security, Concurrency Control: Transaction & Locking Database. Kinds of Failure, Recovery Techniques.

UNIT-II

Three Data Models: An Overview of three Main Data Models i.e. Hierarchical Model, Network Model, Relational Model and their Inter comparison. Concept of Relation, Relational Algebra: Basic Operation like Union, Intersection, Difference, Product, Join. The Power of SQL (Creation, Insertion, Deletion, Indexing & Modification of Databases in SQL)

UNIT-III

Normalisation: Relational Database Design: Integrity Constraints, Functional Dependency: Single Value and Multi Value Functional dependence, Normal Forms: I, II, III, Boyce Codd, & IV Normal forms. Join dependency. Special Purpose Databases: OODBMS- Object Based Databases, OO Data Model, OO Languages, Persistence, Object, Relational Databases, XML, Structure of XML, Temporal Databases, Mobile Databases, Spatial Databases

UNIT-IV

Introduction to Database and Foxpro package: Ideas of database hierarchy (bit, byte. field, record). Foxpro commands: create, use, list, display, edit, browse, append, insert, delete, zap, pack, copy, to print, quit, clear, go top, go bottom, modify structure, recall, replace, sort, index, locate, continue, seek, search, find, close. Arithmetic, date. time and string function with database using commands/ functions such as count, average, sum, time, day, dow, cdow, year, date, ctod, dtoc, cmonth, month, val, trim, str. displaying information with ? and ??.

UNIT- V

Programming: Using Input, Output statements and Conditional statement ACCEPT, INPUT, IF-ELSE-ENDIF, DO CASE-ENDCASE, DO WHILE-ENDDO, TEXT-ENDTEXT, SKIP, WAIT, STORE, SET commands. Generation of Report, Label and Customized Screen, Use of multiple files: Master file updation, Setting relations

Reference Books:

1. Henry F. Korth& A. Silbershatz: Data Base System Concepts, MGH
2. C.J. Date: Database Management System, MGH
3. R. K. Taxali: Foxpro 2.6, TMH.
4. Arun K. Majumdar & P. Bhattacharya: Data Base Management System, TMH
5. Jeffrey O. Ullman: Principles of Database Systems, Galgotia Pub. Co. Ltd.
6. Bipin C. Desai: An Introduction to Database Systems, Galgotia Pub. Co. Ltd.
7. James Martin: Principles of Database Management, PHI
8. James Martin, Computer Database organization, PHI

PGDCA204 – Software Lab I (Problem based on 201)

Course Objectives:

- Implement Strings, Vectors, Interfaces, Packages and Threads Handling in Java. Implement Java Applets, AWT, Swings, Servelet.
- Learn and Understand the Implementation of GUI Application, Web Applications, N-Tier Architecture.
- Develop the Understandings of File Handling, Database Connectivity, Java Servlets and Web Application in Java.
- Learn and Understand the Implementation of GUI Application, Web Applications, N-Tier Architecture.

Course Outcomes

- Use the Java SDK & JRE Environment to Create, Debug and Run Simple Java Programs.
- Analyze the Problem, Identify the Requirements & Features of Applications and Utilities
- Implement Object Oriented Concepts for Solving Real Problem.
- Develop Small Applications, Utilities, and Web Applications Using AWT, Event and Layout Managers

List of Experiments on Java:

1. Write a Program in Java to Calculate the Simple Interest.
2. Write a Program in Java to Calculate Sum of Two Numbers Input from Command Line Argument.
3. Write a Program in Java to Calculate Area of Circle Using Scanner Class.
4. Write a Program in Java to Calculate Square Root of a Number.
5. Write a Program in Java to Display Name, Age, Calendar and Salary of a Person Input from the Keyboard.
6. Write a Program in Java to Display Grading of Student When His Percentage is Input from Keyboard.
7. Write a Program in Java to Display Odd Number from 1 to 100.
8. Write a Program in Java to Calculate the Factorial of a Number.
9. Write a Program in Java to Determine Whether a Number Input from Keyboard is Prime Number Or Not.
10. Write a Program in Java to Display the Prime Numbers from 1 to 500 Using Function.
11. Write a Program in Java to Show Accessing Class Members and use a Dot(.).
12. Write a Program in Java to Show Multilevel Inheritance.
13. Write a Program in Java to Show Single Inheritance.
14. Write a Program in Java to Concatenate Two Strings Without Using Library Function.

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15. Write a Program in Java to Make First Alphabet Capital of Each Word in a String.
16. Write a Program in Java to Get the Last Index of Any Given Character in a String.
17. Write a Program in Java to Reverse Words of a String.
18. Write a Program in Java to Find Occurrences of Each Character in a String.
19. Java Program to Get String and Count Number of Words in Provided String.
20. Write a Program in Java to Check Given String is Palindrome String Or Not in Java.
21. Write a Program in Java to Reverse Each Word of Given String.
22. Write a Program in Java to Get Sub String from a Given String.
23. Java Program to Convert String to Lowercase and Uppercase.
24. Create a Java Applet and Show the use of Drawstring() Function.
25. Create a Java Applet to Show How to use Various Methods of Applet Class and Graphics Class in a Java Applet.
26. Write a Program in Java to Show the use of Interface.
27. Write a Program in Java to Display the Following Pattern.

    1
    2 2
    3 3 3
    4444
    55555
28. Write a Program in Java to Display the Following Pattern Using Function.

    1
    2 2
    3 3 3
    4444
    55555
29. Write a Program in Java to Display the Following Pattern Using Function.

    1
    2
    2 3
    2 3 4
    2345
30. Write a Program in Java to Display the Following Pattern Using Function.

    1
    3
    4 5 6
    78910
    11 12 13 14

PGDCA205 – Software Lab II (Problem based on 203)

Course Objectives:

- To provide practical practice to the discipline of database management.
- To familiarise the participant with the nuances of database environments towards an information-oriented data-processing oriented framework.
- To give a good formal foundation on the relational model of data.
- To give an introduction to systematic database design approaches.
- To present the concepts and techniques relating to Query Processing, Form and Reports in Ms Access.

Course Outcome:

- Understand and apply the key concepts of database technology.
- Analyze, design and implement the database system to solve the real problems.
- Carry out the administration and Management activities of Database System using SQL, Foxpro
- Write the SQL & Foxpro program for optimal query for fetching the information from database

LIST OF EXPERIMENTS ON DBMS

1. Draw an ER Diagram for University Database.
2. Draw an ER Diagram for Library Management System. Convert it to Tables.
3. Create a Library Management Schema/ Database and Search Anomalies in it.

4. Normalize the Following Schema with Given Constraints.
   Books(Accessionno,Isbn,Title,Author,Publisher)
   Users(Userid,Name,Deptid,Deptname)
   Accessionno ->ISBN
   ISBN ->Title
   ISBN -> Publisher
   ISBN ->Title
   Userid -> Name,
   Userid ->Deptid
   Deptid -> Department

7. Compare 3NF and BCNF with Appropriate Example

Database Query

8. Give Exercise on DDL and DML.

9. Create a Database Named “School.Mdb” and Perform the Following Tasks Using Ms Access or My SQL

10. Create a Table Named “Studentinfo” Having Following Table Structure.

Field Name	Data Type	Structure
Class	Number	
Section	Text	
Roll No.	Number	
Name	Text	40 Characters Long
Status	Lookup Wizard	Two Value Senior and Junior
Photo	Ole Object	Photos of Student
Dob	Date/Time	Date of Birth of Students
Remarks	Memo	

- Fill At List 5 Records
- Prepare a Query to Display All Records and Name Should Be in Ascending Order.
- Prepare a Query Name “ Senior” to Display Records Including Fields Name, Class, Sec, Rollno. Status, Photo and Value of “Status” Field Must Be senior
- Prepare a Form of Above Query “Senior”
- Prepare a Report of All the Fields of Above Table

Forms and Report

11. Create a Database Named “Library.Mdb” and Perform the Following Tasks:

12. Create a Table Named “Book” Having Following Structure:

Field Name	Data Type
Bookid	Text
Bname	Text
Wname	Text
Pyear	Date/Time
Pname	Text
Price	Currency

- Add at Least 5 Records.
- Prepare a Query to Display Only Records Including Book Name, Writer Name and
- Name. Save the Query as “Q_Book”.
- Prepare a Query to Display All Records on the Basis of Price Which is More Than Rs500.
- Prepare a Form on the Basis of Table.
- Prepare a Report on the Basis of Query Named "Q_Book

Fox Pro

13. Discuss all Foxpro commands with suitable example.
14. Create a Report in Foxpro.
15. Create a Form in Foxpro.
16. Write a program in Foxpro which illustrate the use of If-Else-Endif.
17. Write a program in Foxpro which illustrate the use of Do Case End Case.
18. Write a program in Foxpro which illustrate the use of Do while-end do.
19. Write a program in Foxpro which illustrate the use of Text-EndText.

Programme – B.Sc. (Hon) Computer Science

Programme Outcomes

POs.1	To understand both the theoretical and practical concepts of Computer Science.
POs.2	To gain programming skill to provide solutions for real world problems.
POs.3	To gather a better understanding to analyze, design and development of software systems.

Programme Specific Outcomes

PSOs.1	Demonstrate understanding of the principles and concepts of the computer systems to develop efficient computing system.
PSOs.2	Analyze, design, develop, implement and test computer programmes for providing solutions for computing problems.
PSOs.3	Enhancing skills and learning new computing technologies for attaining professional excellence and research.
PSOs.4	Design and develop computer programs/computer-based systems in the areas related to algorithms, networking, web design and data analytics of varying complexity.
PSOs.5	Acquaint with the contemporary trends in industrial/research and thereby bring forth novel solutions to existing problems.

BSCSH-101-Foundation course-I (English)

BSCSH-102-Programming fundamentals using C

COs.1	Illustrate the fundamentals of programming languages.
COs.2	To become skilled at developing simple algorithms.
COs.3	Analyze different data types and arrays
COs.4	To learn about array, functions and Pointers.

BSCSH-103 Computer System Architecture

COs.1	Understanding of digital system, its organization and architecture.
COs.2	Apply knowledge of digital electronics logic gate to combinational and sequential circuits.
COs.3	Knowledge of the basics of computer hardware and how software interacts with computer hardware.
COs.4	Apply concepts of assembly language in solving problems.
COs.5	Illustrate the concept of processing I/O organization and examine different ways of communicating with I/O devices and standard I/O interfaces.

BSCSH-104-Maths's I-Calculus and linear algebra

COs.1 Assimilate the notions of limit of a sequence and convergence of a series of real numbers.
COs.2 Calculate the limit and examine the continuity of a function at a point.
COs.3 Understand the consequences of various mean value theorems for differentiable functions.
COs.4 Understand the importance of roots of real and complex polynomials and learn various methods of obtaining roots.
COs.5 Familiarize with relations, equivalence relations and partitions.
COs.6 Employ De Moivre's theorem in a number of applications to solve numerical problems.
COs.7 Recognize consistent and inconsistent systems of linear equations by the row echelon form of the augmented matrix, using rank.

BSCSH-105-Physics I- mechanics and properties of matters

COs.1 Understand the role of vectors and coordinate systems in Physics.
COs.2 Write the expression for the moment of inertia about the given axis of symmetry for different uniform mass distributions.
COs.3 Explain the conservation of energy, momentum, angular momentum and apply them to basic problems.
COs.4 Understand the analogy between translational and rotational dynamics, and application of both motions simultaneously in analyzing rolling with slipping.

BSCSH-201-Foundation course-II (Basic of Computer and Information Technology)

BSCSH-202-Internet technology

COs.1 To understand basics of the Internet and World Wide Web
COs.2 To acquire knowledge and skills for creation of web site considering both client and server-side programming
COs.3 To learn basic skill to develop responsive web applications
COs.4 To understand different web extensions and web services standards
COs.5 To understand basic concepts of Search Engine Basics.
COs.6 To learn Web Service Essentials.
COs.7 To learn Rich Internet Application Technologies.

BSCSH-203-Data structure

COs.1 To be familiar with fundamental data structures and with the manner in which these data structures can best be implemented; become accustomed to the description of algorithms in both functional and procedural styles
COs.2 To have knowledge of complexity of basic operations like insert, delete, search on these data structures.

COs.3 Ability to choose a data structure to suitably model any data used in computer applications.
COs.4 Design programs using various data structures including hash tables, Binary and general search trees, heaps, graphs etc.
COs.5 Ability to assess efficiency tradeoffs among different data structure implementations.

BSCSH-204-Math's II- Calculus and geometry

COs.1 Apply mathematical geometry and logic to solve complex problems in the domain of mathematics.
COs.2 Understand the consequences of various mean value theorems for differentiable functions.
COs.3 Sketch curves in Cartesian and polar coordinate systems.
COs.4 Apply derivative tests in optimization problems appearing in social sciences, physical sciences, life sciences and a host of other disciplines.

BSCSH-205-physics II-Thermodynamics and statistical physics

BSCSH-301-Foundation Course-III (Hindi Bhasha)

BSCSH-302-Computer networks

COs.1 Learn data transmission models, modulation, multiplexing.
COs.2 Understand applications of layers such as application layer, transport layer, network layer, data link layer.
COs.3 Understand the importance of network security and management by analyzing different threats, principles of cryptography, digital signature, and internet network management framework.

BSCSH-303-Database management system and SQL

COs.1 Understand concepts of database system architecture.
COs.2 Able to understand relational model and perform SQL operations.
COs.3 Understand the importance of normal forms and learn query optimization.
COs.4 Learns the importance of transaction processing and concurrency control.
COs.5 Learn the concept of data warehousing and data mining.

BSCSH-304-Math's III- Basic Probability and Statistics

BSCSH-305-Physics III-Optics

BSCSH-401-Foundation course-IV (Environmental Studies)

BSCSH-402-Software engineering

COs.1 Able to apply the concepts of software engineering which is essentially important while working on big modules and or projects.
COs.2 Understand the concept of system and able to analyse its feasibility study.
COs.3 Understand software process framework, requirement modelling approaches, software design, and software quality.
COs.4 Able to apply software metrics and software testing.

BSCSH-403-Discrete mathematics

COs.1 Prepare to develop mathematical logic essentially required in complex programming.
COs.2 Able to learn and apply set theory, algebraic structures, lattices and Boolean algebra, graph theory.
COs.3 Able to troubleshoot fault detection in combinational switching circuits.
COs.4 Understand and able to apply learns to analyse algorithms for generating a fault matrix.

BSCSH-404-Maths IV- Real Analysis and differential equations

COs.1 To achieve knowledge and understanding of sets, their various properties and capabilities to solve wide range of problems in science and engineering.
COs.2 To get familiar with concepts of cardinal numbers and develop ability to solve simple and complex problems.
COs.3 To understand Rings and their applications in mathematical sciences.
COs.4 To learn basic concepts of Differentiations and Integrations.
COs.5 To acquire knowledge of Convergence series.
COs.6 Ability to acquire knowledge of ordinary differential equations.

BSCSH-405-Physics IV- Quantum Mechanics and solid state

COs.1 Understand properties and applications of special functions like Legendre polynomials, Bessel functions and their differential equations and apply these to various physical problems such as in quantum mechanics.
COs.2 Learn about gamma and beta functions and their applications.
COs.3 Solve linear partial differential equations of second order with separation of variable method

BSCSH-501-Foundation course V (Entrepreneurship Development)

BSCSH-502-Java programming

COs.1 Learn Java programming language which can be utilized to develop windows and internet based software solutions.
COs.2 Able to understand and apply the knowledge of object-oriented principles, applets, graphical user-interface for scientific and business oriented applications.

BSCSH-503-System programming

COs.1 Understand basic concepts in systems programming.
COs.2 Understand basic concepts of microprocessors.
COs.3 Understand the concept of virtual machine.
COs.4 Develop skills to write programs using system services.

BSCSH-504-Cloud Computing

COs.1 Analyze the trade-offs between deploying applications in the cloud and over the local infrastructure.
COs.2 Compare the advantages and disadvantages of various cloud computing platforms.
COs.3 Deploy applications over commercial cloud computing infrastructures such as Amazon Web Services, Windows Azure, and Google AppEngine.
COs.4 Program data intensive parallel applications in the cloud.
COs.5 Analyze the performance, scalability, and availability of the underlying cloud technologies and software.
COs.6 Identify security and privacy issues in cloud computing.
COs.7 Explain recent research results in cloud computing and identify their pros and cons.
COs.8 Solve a real-world problem using cloud computing through group collaboration

BSCSH-505-Design and analysis of algorithm

COs.1 Learn to compute the time and space complexity of a given algorithm and analyse the efficiency of algorithms.
COs.2 Learns the utilization of different prototypes of problem solving to solve a given problem.
COs.3 Understand and analyse greedy algorithms, dynamic programming, concepts of tractable and intractable problems.
COs.4 Understand the class of P, NP and NP-complete problems.

BSCSH-601-Theory of computation

COs.1 Use concepts of formal languages of finite automata techniques.
COs.2 Design Finite Automata's for different regular expressions and languages.
COs.3 Construct context free grammar for various languages.

COs.4 Solve various problems of applying normal form techniques, push down automata and Turing Machines.

BSCSH-602-Computer Graphics

COs.1 Apply mathematical geometry and logic to develop Computer programs for elementary graphics operations and to develop scientific and strategic approach to solve complex problems in the domain of Computer Graphics.
COs.2 Demonstrate an understanding of contemporary graphics hardware.
COs.3 Ability to draw graphics using line & polygon and ability to perform operations on computer graphics.
COs.4 Understand and demonstrate geometrical transformations, Segment, Windowing and Clipping, Interaction.
COs.5 Understand and demonstrate 2D & 3D image processing techniques.
COs.6 Understand and demonstrate Hidden Surfaces & Lines; Light, Colour& Shading; Curves and Fractals

BSCSH-603-.Net programming

COs.1 To understand the concept of .Net Framework to introduce .Net framework
COs.2 Constant, variable, operators, constructor, looping and array to learn programming skill. To learn basic syntax of VB.
COs.3 Working with controls to understand various control, properties and events. To develop application using controls.
COs.4 With with Activex control and Menus To understand the use of active control To learn how to create menus and submenus
COs.5 Working with database to learn connectivity between .Net front end and database.
COs.6 To understand report generation using Data Environment.

BSCSH-604-Operating system

COs.1 Analyze & Classify different types of operating system.
COs.2 Understand the working of Operating system.
COs.3 Understand the Memory Management policies.
COs.4 Concepts of input/output, storage and file management.
COs.5 Understand various protection and security mechanisms

DEPARTMENT OF COMPUTER SCIENCE

A.P.S. UNIVERSITY, REWA (M.P.)

B.Sc. (Honrs.) IN COMPUTER SCIENCE

(3 years, Six Semester Full time Course, Under Self Supporting)

2017-18 Onwards

Subject to the approval of higher bodies after due amendment in the ordinance, where ever necessary

Detailed syllabus B. Sc. CS 2008-09, based on the decision taken by BOS, Computer Science, APSU, in view of the guidelines issued by M.P. Higher Education Commission'

R.K. Kateria

Dr. Manish K. Gupta

Shrivastava 4/12/18

DEPARTMENT OF COMPUTER SCIENCE

A.P.S. UNIVERSITY, REWA (M.P.)

	B.Sc. (Honours) Computer Science Syllabus				
CLASS/SEMESTER	B. Sc.(CS) Hons.	CCE Max/Min	Theory Max/Min	Practical Max/Min	Total Marks
	BSCSH-101-Foundation Course I	15/5	85/28		100
	BSCSH-102-Programming Fundamental Using C	15/5	85/28		100
	BSCSH-103-Computer System Architecture	15/5	85/28		100
	BSCSH-104-Math's I - Calculus and Linear Algebra	15/5	85/28		100
	BSCSH-105-Physics I - Machanics and Properties of Matters	15/5	85/28		100
	BSCSH-106 Lab I -Problem based on BSCSH102 and BSCSH103			50/17	50
	BSCSH-107-LabII -Problem based on BSCSH104 and BSCSH105			50/17	50
SECOND SEM	BSCSH-201-Foundation Course II	15/5	85/28		100
	BSCSH-202-Internet Technology	15/5	85/28		100
	[illegible]-203-Data Structure	15/5	85/28		100
	BSCSH-[illegible]04 Math's - II - Calculus and Geometry	15/5	85/28		100
	BSCSH-205-Physics II - Thermodynamics and Statistical Physics	15/5	85/28		100
	BSCSH206- lab I Problem based on BSCSH202 and BSCSH203			50/17	50
	BSCSH207- LabII Problem based on BSCSH204 and BSCSH205			50/17	50
THIRD SEM	BSCSH-301-Foundation Course III	15/5	85/28		100
	BSCSH-302- Computer Networks	15/5	85/28		100
	BSCSH-303- Data Base Management System and SQL	15/5	85/28		100
	BSCSH-304- Math's III - Basic Probability and Statistics	15/5	85/28		100
	BSCSH-305-PhysicsIII - Optics	15/5	85/28		100
	BSCSH306- Lab IProblem based on BSCSH302and BSCSH303			50/17	50
	BSCSH307- LabII Problem based on BSCSH304 and BSCSH305			50/17	50
FOURTH SEM	BSCSH401- Foundation Course IV	15/5	85/28		100
	BSCSH402 –Software Engineering	15/5	85/28		100
	BSCSH403 –Discrete Mathematics	15/5	85/28		100
	BSCSH404 – Math's IV-Real Analysis and /Differential Equations	15/5	85/28		100
	BSCSH405 –PhysicsIV - Quantum Mechanics and Solid State	15/5	85/28		100
	BSCSH406-Lab I Problem based on BSCSH402 and BSCSH403			50/17	50
	BSCSH407- LabIIProblem based on BSCSH404 and BSCSH405			50/17	50
FIFTH SEM	BSCSH501-Foundation Course V	15/5	85/28		100
	BSCSH502-Java Programming	15/5	85/28		100
	BSCSH503-System Programming	15/5	85/28		100
	BSCSH504 –Cloud Computing	15/5	85/28		100
	BSCSH505- Design And Analysis of Algorithm	15/5	85/28		100
	BSCSH506- LabI Problem based on BSCSH502 and BSCSH503			50/17	50
	BSCSH507- LabII Problem based on BSCSH504 and BSCSH505			50/17	50
SIXTH SEM	BSCSH601 –Theory of Computation	15/5	85/28		100
	BSCSH602 –Computer Graphics	15/5	85/28		100
	BSCSH603 – .Net Programming	15/5	85/28		100
	BSCSH604- Operating System	15/5	85/28		100
	BSCSH605- Minor Project			100	
	BSCSH606- LabIProblem based on BSCSH601 and BSCSH603			50/17	50
	BSCSH607- Lab II Problem based on BSCSH602 and BSCSH604			50/17	50
	Grand Total				3600

R.K. Kelar
10-6-2016

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Department of Computer Science
A.P.S. University, Rewa (M.P.)
Syllabus for B.Sc. Computer Science(Honrs.)- - First Semester (Session 2018-19)
(BSCSH-l01) – FC I ENGLISH LANGUAGE

Maximum Marks: 85 **Minimum Pass Marks: 28**

UNIT I

1. Where the mind is without fear: Rabindranath Tagore
2. The Hero: R K Narayan
3. Trust with Destiny: Jawaharlal Nehru
4. Indian weavers: Sarojini Naidu
5. The Portrait of a Lady: Khuswant Singh
6. The solitary Reaper: William Wordsworth

UNIT – II

Basic Language Skills: Vocabulary, Synonyms, Antonyms, Word Formation, prefixes and suffixes.

UNIT III

Basic Language Skills: Uncountable Noun, verbs, Tenses, Adverbs.

UNIT IV Comprehension/unseen passage/Translation of sentences (English to Hindi & Hindi to English)

UNIT V Composition and Paragraph writing.(Any Two) 5+5=10 marks

R.K. Kataria

4/12/18

Department of Computer Science
A.P.S. University, Rewa (M.P.)
Syllabus for B.Sc. Computer Science (Honrs.) - First Semester (Session 2018-19)
(BSCSH-l02) PROGRAMMING IN C

Maximum Marks: 85 **Minimum Pass Marks: 28**

UNIT I

Structure of C program, keywords, identifiers, constants, variables, data types, type conversion, Types of operators and expressions, Input and output functions in C. Decision Statement – IF-ELSE statement, break, continue, goto , switch() case and nested IF statement.

UNIT II

Loop Control Statements – For loop, While loop , Do-while loop and nested loops. Arrays – Definition, Initialization, characteristics, One, Two, Three and Multidimensional Arrays, scanf() and printf() functions, Working with Strings & Standard Functions.

UNIT III

Pointers – Introduction, features, Declaration, Arithmetic operations, pointers and Arrays, Array of pointers, pointers to pointers, pointers and strings, Void pointers.

UNIT IV

Functions – Declaration, Prototype, Types of functions, call by value and reference, Function with operators, function with decision statements, function with Loop statements, Function with Arrays and Pointers, Types of Storage Classes.

UNIT V

Structure and Union – Declaration, Initialization, structure within structure, Array of structure, Enumerated data types, Union of structure, Files – Streams and file types, file operations, File I/O, Read ,Write and Other file function.

TEXT BOOKS

1. *E. Balaguruswamy, "Programming In C ", TMH Publications*

REFERENCE BOOKS

2. *Ashok Kamthane – "Programming with ANSI & Turbo C - Pearson*
3. *Gottfried, Schaums Outline Series, " Programming With C ", TMH Publications*
4. *Mahapatra, " Thinking In C ", PHI Publications*

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Department of Computer Science
A.P.S. University, Rewa (M.P.)
Syllabus for B.Sc. Computer Science (Honrs.) - First Semester (Session 2018-19)
(BSCSH-I03) COMPUTER SYSTEM ARCHITECTURE

Maximum Marks: 85 **Minimum Pass Marks: 28**

UNIT I

Evolution of Computers - Generations, Types of computers, Computer system characteristics, Basic components of a Digital Computer - Control unit, ALU, Input /Output functions and memory, Memory Hierarchy, Memory addressing capability of a CPU, Word length of a computer, processing speed of a computer.

UNIT-II

Number systems – Decimal Number system, Binary number system, Octal & Hexa-decimal number system,1's & 2's complement, Binary Fixed- Point Representation, Arithmetic operation on Binary numbers, Overflow & underflow. Floating Point Representation, Codes, ASCII, EBCDIC codes, Gray code, Excess-3 & BCD, Error detection & correcting codes, Logic Gates, AND, OR, NOT GATES and their Truth tables, NOR, NAND & XOR gates.

UNIT III

Flip-flops - RS, D, JK & T Flip-flops, Registers, Shift Registers, Multiplexer, De-multiplexer, Encoder, Decoder, Counters.

UNIT IV

Boolean algebra – Basic Operations and Boolean Law's, Demorgan's theorem, K -Map, Sum of Product & Product of Sum. Combinational & Sequential circuits, Half Adder & Full Adder, Subtractor.

UNIT V

DMA- Control signals for DMA transfers, Block diagram of DMA controller, DMA transfer in a microcomputer system. Instruction Sets – Characteristics and Functions, Types of Operations Addressing modes and formats, Processor Organization, Instruction cycle and register organization

TEXT BOOKS

1. *Computer Fundamentals – B. Ram – New Age International Publishers*

REFERENCE BOOKS

1. *William Stallings, "Computer Organization & Architecture", Pearson.*
2. *BARTEE, "Digital Computer Fundamentals " TMH Publication*
3. *MORRIS MANO, "Computer System Architecture " PHI*

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Department of Computer Science
A.P.S. University, Rewa (M.P.)
Syllabus for B.Sc. Computer Science (Honrs.)- First Semester (Session 2018-19)
(BSCSH-104) CALCULAS AND LINEAR ALGEBRA

Maximum Marks: 85 **Minimum Pass Marks: 28**

UNIT- I

Differential Calculus: Successive differentiation, Leibnitz theorem, Maclaunin's and Taylor's series expansion, Asymptotes, Curvature.

UNIT-II

Integral Calculus: Integration of irrational algebraic functions and transcendental functions, Reduction Formulae, Definite Integrals, Arc length, area under a curve and volume of reduction.

UNIT-III

Matrix Theory : Linear dependence and in-dependence of vectors, Echelon matrix, Rank and nullity of matrix,, Eigen values and Eigen vectors, Characteristic equation of a matrix, Cayley Hamilton theorem and its uses in finding inverse of matrices. Application of matrix to a system of linear (both homogenous and non-homogenous) equations.

UNIT-IV

Vector space: Definition of group, ring, ideal and quotient rings, Field , Definition and examples of vector spaces, Subspaces Sub spaces, Sum and direct sum ,Linear span, Linear dependence and in-dependence, Basis and dimensions of Vector spaces.

UNIT-V

Linear transformation as their representation as matrices: The Algebra of Linear transformation and Rank Nullity theorem, Change of Basis.

Text Books:

1. ***Courant and F. John***, *Introduction to Calculus and Analysis (Vol. I), Courant Institute of Math. Sci. New York, 1965.*
2. ***G. Prasad***, *A Text Book on Differential Calculus, Pothishala Private Limited.*
3. ***G. Prasad***, *A Text Book on Integral Calculus, Pothishala Private Limited*
4. ***David C. Lay***, *Linear Algebra and its Applications (4th Edition), Pearson Education Asia, Indian Reprint, 2012.*

Reference Books:

1. ***G.B. Thomas and R.L. Finney***, *Calculus, 9th Ed., Pearson Education, Delhi, 2005.*
2. ***M.J. Strauss, G.L. Bradley and K. J. Smith***, *Calculus, 3rd Ed., Dorling Kindersley (India) P. Ltd. (Pearson Education), Delhi, 2007.*
3. ***S. Lipschutz, M. Lipson***, *Linear Algebra (4th Edition), Schaum's Outlines*

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Department of Computer Science
A.P.S. University, Rewa (M.P.)
Syllabus for B.Sc. Computer Science (Honrs.) - First Semester (Session 2018-19)
(BSCSH-l05) MECHANICS AND PROPERTIES OF MATTER

Maximum Marks: 85 **Minimum Pass Marks: 28**

UNIT-I

Mathematical Physics: Addition, subtraction and product of two vectors; Polar and axial vectors and their examples from Physics; Scalar and vector fieldsUnit tangent vector and unit normal vector; Gradient; Divergence and curl; Laplacian operator; Idea of line, surface and volume integrals; Guass', Stokes and Green's Theorems.

UNIT-II

Kinematics: Displacement , Time and Average Velocity(x-t graph illustrations to be included; Instantaneous Velocity(Finding of velocity on an x-t graph),Average and instantaneous Acceleration(Illustration with v-t graph and a-t graph), Motion with constant Acceleration(Illustration with a-t and v-t graph), Free falling bodies(Up and down motion in fall with y-t and v_y-t graph),
Newton's law of motion and its explanation with problems, various types of forces in nature (explanation), Pseudo Forces (e.g. Centrifugal Force), Coriolis force and its applications. Motion under a central force. Derivation of Kepler's laws. Gravitational law and field. Potential due to spherical body. Guass and Poisson's equation of Gravitational self energy. System of Particles. Centre of mass and reduced mass. Elastic and inelastic collisions.

UNIT-III

General Properties of Matter: Elasticity: Hook's law and coefficient of elasticity, Young's modulus, Bulk modulus and modulus of rigidity, Work done during longitudinal strain, volume strain and shearing strain. Poisson's ratio; Relation between three elastic moduli (Y, ή, K), Determination of Y of rectangular thin bar loaded at the centre,
Surface Tension: Surface tension, Angle of Contact, Capillary Rise method; Energy required to raise the liquid in capillary tube; Jeager's method for determination of Surface tension; Application of Surface tension.
Viscosity and Fluid Mechanics: Concept of Viscous forces and Viscosity; Steady and Turbulent flow; Reynold's number; Equation of Continuity; Bernoulli's Principle; Application of Bernoulli's equation- I0i) Speed of Efflux (ii) Venturimeter (iii) Aspirator pump.

UNIT-IV

Oscillations: Concept of Simple, Periodic and Harmonic oscillation with illustrations; Differential equation of harmonic oscillator; Kinetic and Potential energy of Harmonic Oscillator; Oscillations of two masses connected by a spring; Transitional and Rotational motion, Moment of Inertia and their product; Principal moments and axes; Motion of rigid body, Euler's equation.

R.K. Kateria

4/12/18

UNIT -V

Relativistic Mechanics: Michelson-Morley experiment and its outcome; Postulates of special teory of Relativity; Lorentz Transformations; Simultaneity and order of events. Lorentz contraction; time dilation, Relativistic transformation of velocity, frequency and wave number, Relativistic addition of velocities, Variation of mass with velocity.

Earlier development in Physics up to 18th Century: Contributions of Aryabhatt, Archimedes, Nicolus Copermicus, Galileo Gallilei , Huygens, Robert Hooke, Torricelli, Verenier, Pascal, Kepler, Newton, Boyle, Young, Thompson, Coulomb, Amperes, Guass, Biot-Savarts, Cavendish, Galvani, Franklin Bernoulli.

Text Books

1. ***Naryanamoorthy*** *– Mechanics Part I and II, National Publishing Company*
2. ***D.S.Mathur*** *– Mechanics, S. Chand & Co, I Edition, 2006*
3. ***R.Murugeshan*** *– Mechanics and Mathematical Methods, S.Chand & Co, II Edition, 2005.*
4. ***R.Murugeshan*** *– Modern Physics, S. Chand & Co. (for Relativity),13th Edition, 2008*

Reference Books

1. *University Physics. – **I, J. C. Upadhyaya** (Himalaya Publications)*
2. *Mechanics & Properties of Matter, **J. C. Upadhyaya***
3. *Elements of Properties of Matter, **D.S. Mathur***
4. *A test book of Properties of Matter, **N. S. Khare & S. Kumar***

R.K. Kalra

4/12/18

Department of Computer Science
A.P.S. University, Rewa (M.P.)
Syllabus for B.Sc. Computer Science (Honrs.) - First Semester (Session 2018-19)
(BSCSH-l06) LAB I Problem Based on BSCSH 102 and BSCSH103

Practical list for C Programming Write the algorithm and draw the flowchart (WADF) for the problems given below.

1. WADF to perform arithmetic operations (Addition, Subtraction, Multiplication, Division) on two numbers.

2. WADF to calculate gross salary of an employee [using formula: gross_sal = basic_sal+hra+da].

3. WADF to calculate area of circle.

4. WADF to evaluate marks of student for 3 subjects, calculate percentage and display their grades. Marks grades CASE -1: 90-100 A CASE -2: 80-89 B CASE -3: 65-79 C CASE -4: Otherwise D

5. WADF to determine sum of odd series from 1 to N.

6. WADF to calculate factorial of a number.

7. WADF to print Fibonacci series up to N. [E.g. - 0 1 1 2 3 5.....]

8. WADF to identify whether given number is prime or not.

9. WADF to identify whether given number is even or odd.

10. WADF to print whether given year is leap year or not.

11. WADF to check whether the 5 digit number is palindrome or not [A palindrome number or numeral palindrome is a number that remains the same when its digits are reversed. Like 16461, for example, it is "symmetrical".].

12. WADF to check whether 5 number entered is Armstrong number or not.[An Armstrong number is an n-digit number that is equal to the sum of the nth powers of its digits. Like 153]

13. WADF to find the sum of the digits of a number.

14. WADF to input 3 sides of triangle and identify the type of triangle.

15. WADF to input 5 digit numbers and find the sum of the first and last digit.

16. WADF to check whether the number is power of 2 or not.

17. WADF to find out GCD of two numbers.

18. WADF to check whether given number is perfect power of any natural number.

19. WADF to check whether the number entered is Krishnamurthy number or not. [If the sum of the factorial of each digit is equal to the number itself, then it is called Krishnamurthy number, Like – 145]

20. WADF to convert Fahrenheit to centigrade.

R. K. Kalra

Abhishek Tiwari 4/12/18

Department of Computer Science
A.P.S. University, Rewa (M.P.)
Syllabus for B.Sc. Computer Science (Honrs.) - First Semester (Session 2018-19)
(BSCSH-l07) LAB II Problem Based on BSCSH 104 and BSCSH105

List of Practical

1. Measurements of length (or diameter) using vernier calliper, screw gauge and travelling microscope.

2. To determine the Height of a Building using a Sextant.

3. To determine the Moment of Inertia of a Flywheel.

4. To determine the Young's Modulus of a Wire by Optical Lever Method.

5. To determine the Modulus of Rigidity of a Wire by Maxwell's needle.

6. To determine the Elastic Constants of a Wire by Searle's method.

7. To determine g by Bar Pendulum. 8. To determine g by Kater's Pendulum.

9. To determine g and velocity for a freely falling body using Digital Timing Technique 10. To study the Motion of a Spring and calculate (a) Spring Constant (b) Value of g

Reference Books:

1. Advanced Practical Physics for students, B.L.Flint and H.T.Worsnop, 1971, Asia Publishing House.
2. Advanced level Physics Practicals, Michael Nelson and Jon M. Ogborn, 4th Edition, reprinted 1985, Heinemann Educational Publishers.
3. Engineering Practical Physics, S.Panigrahi & B.Mallick,2015, Cengage Learning India Pvt. Ltd.
4. A Text Book of Practical Physics, Indu Prakash and Ramakrishna, 11th Edition, 2011, Kitab Mahal, New Delhi

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Department of Computer Science
A.P.S. University, Rewa (M.P.)
Syllabus for B.Sc. Computer Science-Second Semester (Session 2018-19)
(BSCSH-201) – FC II(Honrs.)- Basics of Computer & Information Technology
Maximum Marks: 85 **Minimum Pass Marks: 28**

Unit I- Introduction to Computer

Basic Organization of Computer System: Block diagram & Functions (Central Processing Unit, Input/ Output Unit, Storage Unit); Characteristics; Capabilities & Limitations. Types of Computing Devices: Desktop, Laptop & Notebook, Handheld, Smart-Phone, Tablet PC, Server, Workstation & their Characteristics, Primary Memory & Their Types: RAM (DRAM, SRAM, DDR, and RDRAM &EDORAM), ROM, PROM, EPROM, EEPROM; Cache Memory.

Unit II: Peripheral Devices

Input Devices: Keyboard, Mouse, Trackball, Joystick, Digitizer or Graphic tablet, Scanners, Digital Camera, Web Camera, MICR, OCR, OMR, Bar-Code Reader, Voice Recognition devices, Light pen & Touch Screen, Output Devices**:** Display Devices (CRT, TFT; LCD, LED, Multimedia Projectors); Video Standard: VGA, SVGA, XGA *etc*; Impact Printers (Daisy Wheel, Dot Matrix & Line Printer);Non-Impact Printers (Inkjet, Laser, Thermal); Plotters (Drum & Flatbed); Speakers, General introduction of Cards, Ports and SMPS: Expansion Cards(Display/Video/Graphic, Sound and Network Interface), Ports (USB, Serial and Parallel, Network),SMPS.

UNIT III Storage Devices

Magnetic Tape, Cartridge Tape, Data Drives, Hard Disk Drives (Internal & External), Floppy Disks, CD, VCD, CD-R, CD-RW, Zip Drive, DVD, DVD-RW, USB Flash Drive, Blue Ray Disc & Memory cards, Brief description of above storage devices with elementary idea about their capacity and speed.

UNIT IV Operating System

Functions of Operating System, Types of Operating System, Introduction to Operating System for i-pad & Smart phones. Elementary idea of DOS, WINDOWS & LINUX Operating Systems, DOS Basics**:** FAT, File & directory structure and naming rules, Booting process, DOS system files. Internal & External DOS commands, Windows basics (Only elementary idea): W*indows 7 & 8:* Desktop, Control Panel; Saving, Renaming, Moving, Copying Searching files & folders, Restoring from Recycle Bin. Creating Shortcut, Establishing Network Connections, *Features of Windows 8.1:* Touch Screen Features, Tiles, Charms, Customizations and Apps. LINUX basics: Features of LINUX, Starting & Shutting down Linux, and Introduction to Linux files & Directory, General idea about popular main stream Linux distribution such as Debian ,Ubuntu &Fedora.

UNIT V Text Reading & Editing Software

General information about PDF readers: Adobe Acrobat, Nitro, PDF-X Change, *etc. General information about application packages:* Microsoft Office, Open Office & WPS

Department of Computer Science
A.P.S. University, Rewa (M.P.)
Syllabus for B.Sc. Computer Science (Honrs.)- Third Semester (Session 2018-19)
(BSCSH-401) – FC IV (ENVIRONMENTAL STUDIES)

Unit 1 Study of Environment & Ecology

a. Definition and Importance
b. Public participation and public awareness,
c. Ecology- Introduction
d. Ecosystem- Concepts, components and Structure and function of ecosystem components, Energy flow in the ecosystem, Ecological succession, Food chains, food webs and ecological pyramids, types.

UNIT II Environmental Pollution and Population

a. Air, Water, Noise, Heat and Nuclear pollution, Definition, Causes, effect and prevention of pollution.
b. Population Growth, Disparities between countries
c. Population Explosion, Family Welfare Programme.
d. Environment and human health.
e. Cleanliness and disposal of domestic waste.

UNIT III Natural Resource, Problems and Conservation:

a. Forest Resource
b. Water Resource
c. Minerals Resource
d. Food Resource
e. Energy resource
f. Land resource,

Unit IV Biodiversity and its Protection

a. Introduction-Genetic, species and ecosystem diversity,
b. Value of biodiversity: consumptive use, productive use, social, ethical, aesthetic and option values,
c. India as a nation of mega Bio-diversity centre, Biodiversity at global, National and local levels.
d. Threats to biodiversity: loss of habitat, poaching of wildlife, man-wildlife conflicts, Endangered and endemic species of India, Conservation of biodiversity.

Unit V Disaster Management and Environmental Laws

a. Disaster Management- Floods, Earthquakes, cyclones &landslides.
b. Conservation of Laws for air and Water Pollution.
c. Wild life Conservation Laws
d. Role of Information Technology in Environment and health

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Department of Computer Science
A.P.S. University, Rewa (M.P.)

Syllabus for B.Sc. Computer Science (Honrs.) - Fourth Semester (Session 2018-19

(BSCSH 402) SOFTWARE ENGINEERING

Maximum Marks: 85 **Minimum Pass Marks: 28**

UNIT I

Introduction: The Evolving Role of Software, Software Engineering as a Layered Technology, Software Process Framework, Framework and Umbrella Activities, Process Models, Capability Maturity Model Integration (CMMI), Personal and Team Process Models ,Product and Process Models, The Waterfall Model, Incremental Process Models ,Incremental Model, The RAD Model, Prototyping ,The Spiral Model, The Concurrent Development Model.

UNIT II

Requirement Analysis: Software Requirement Analysis, Initiating Requirement Engineering Process, Requirement Analysis and Modelling Techniques, Flow Oriented Modelling, Need for SRS, Characteristics and Components of SRS. Requirements Analysis – Analysis Modelling approaches ,Object oriented Analysis ,Scenario based modelling, Flow oriented Modelling, Class based modelling.

UNIT III

Software Project Management: Estimation in Project Planning Process, Project Scheduling. Risk Management: Software Risks, Risk Identification, Risk Projection and Risk Refinement, RMMM Plan. Quality Management: Quality Concepts, Software Quality Assurance, Software Reviews, Metrics for Process and Projects. Quality & Maintenance,

UNIT IV

Design Engineering: Design Concepts, Architectural Design Elements, Software Architecture, Data Design at the Architectural Level and Component Level, Mapping of Data Flow into Software Architecture, Design process, Design Quality, Design model-User interface Design ,Testing strategies- strategies Issues for conventional and object oriented software-validation testing , system testing ,Art of debugging ,Project management.

UNIT V

Testing Strategies & Tactics: Software Testing Fundamentals, Test Strategies for Conventional Software, Validation Testing, System Testing, Black-Box Testing, White-Box Testing and their type, Basis Path Testing, Verification and Validation -Critical Systems Validation, Metrics for Process, Project and Product, Quality Management ,Risk Management Configuration Management – Software Cost Estimation

TEXT BOOKS:

1. Roger S.Pressman, Software Engineering: A Practitioner's Approach, McGraw Hill International edition, Seventh edition, 2009.
2. P. Jalote, An Integrated Approach to Software Engineering (2nd Edition), Narosa Publishing House, 2003.
3. R. Mall, Fundamentals of Software Engineering (2nd Edition), Prentice-Hall of India, 2004.

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Department of Computer Science
A.P.S. University, Rewa (M.P.)
Syllabus for B.Sc. Computer Science(Honrs.)- Fourth Semester (Session 2018-19

(BSCSH 403) DISCRETE MATHEMATICS

Maximum Marks: 85 **Minimum Pass Marks: 28**

UNIT I

Introduction: Sets - finite and Infinite sets, uncountable Infinite Sets; functions, relations, Properties of Binary Relations, Closure, Partial Ordering Relations; counting - Pigeonhole Principle, Permutation and Combination; Mathematical Induction, Principle of Inclusion and Exclusion.

UNIT II

Growth of Functions: Asymptotic Notations, Summation formulas and properties, Bounding Summations, approximation by Integrals

UNIT III

Recurrences: Recurrence Relations, generating functions, Linear Recurrence Relations with constant coefficients and their solution, Substitution Method, Recurrence Trees, Master Theorem

UNIT IV

Graph Theory: Basic Terminology, Models and Types, multigraphs and weighted graphs, Graph Representation, Graph Isomorphism, Connectivity, Euler and Hamiltonian Paths and Circuits, Planar Graphs, Graph Coloring, Trees, Basic Terminology and properties of Trees, Introduction to Spanning Trees

UNIT V

Prepositional Logic: Logical Connectives, Well-formed Formulas, Tautologies, Equivalences,
Inference Theory

Recommended Books:

1. C.L. Liu & Mahopatra, Elements of Discrete mathematics, 2nd Sub Edition 1985, Tata McGraw Hill
2. Rosen, Discrete Mathematics and Its Applications, Sixth Edition 2006
3. T.H. Coremen, C.E. Leiserson, R. L. Rivest, Introduction to algorithms, Prentice Hall on India (3rd edition 2009)
4. M. O. Albertson and J. P. Hutchinson, Discrete Mathematics with Algorithms 1988 Johnwiley Publication
5. J. L. Hein, Discrete Structures, Logic, and Computability, Jones and Bartlett Publishers, 3rd Edition, 2009
6. D.J. Hunter, Essentials of Discrete Mathematics, Jones and Bartlett Publishers, 2008

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Department of Computer Science
A.P.S. University, Rewa (M.P.)
Syllabus for B.Sc. Computer Science (Honrs.) - Fourth Semester (Session 2018-19)
(BCS-404) REAL ANALYSIS & DIFFERENTIAL EQUATIONS

Maximum Marks: 85 **Minimum Pass Marks: 28**

UNIT- I

Riemann integral, Integrability of continuous and monotonic functions, The fundamental theorem of integral calculus, Mean value theorems of integral calculus, Partial derivatives and differentiability of real-valued functions of two variables.

UNIT- II

Schwarz and Young's theorem, Implicit function theorem, Fourier series of half and full intervals, Improper integrals and their convergence, Comparison test , Abel's and Dirichlet's tests, Frullani's integral, Integral as a function of a parameter.

UNIT- III

Linear differential equations and equations reducible to the linear form, Exact differential equations, First order higher degree equations for x y and p, Clairaut's equation and singular solutions, Geometrical meaning of a differential equation, Orthogonal trajectories.

UNIT- IV

Linear differential equations with constant coefficients, Homogenous linear ordinary differential equations, Linear differential equations of second order , Transformation of equations by changing the dependent variable and independent variable, Method of variation of parameters.

UNIT- V

Series solutions of differential equations, Power series method, Bessel and Legendre equations, Bessel's and Legendre's functions and their properties-recurrence and generating function, Orthogonality of functions.

Text Book:

1. Real Analysis Linear Algebra and Discrete Mathematics: Dr. H K Pathak.
2. Calculus and Differential Equation: BR Thakur and Dr. Hari Kishan, Ram Prasad Publications.
3. Differential Equation : BR Thakur and Dr. RS Chandel Ram Prasad Publications.

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Department of Computer Science
A.P.S. University, Rewa (M.P.)
Syllabus for B.Sc. Computer Science (Honrs.) - Fourth Semester (Session 2018-19)
(BSCSH-405) PHYSICS IV –QUANTUM MECHANICS AND SOLID STATES

Maximum Marks: 85 **Minimum Pass Marks: 28**

UNIT I Quantum Mechanics-I

Particles and Waves: Basic postulates of quantum mechanics, equation of continuity, Photoelectric effect, Black body radiation, Compton effect, De Broglie Hypothesis, Wave particle duality, Davisson-Gerber experiment, wave packets, concept of phase and group velocity, Two slit experiment with electrons, probability, wave amplitude and wave functions, Heisenberg's Uncertainty principle with illustrations, Basic postulates and formalism of Schrodinger's Equation, Eigen values, Probabilistic interpretation of wave function, Equation of continuity, probability current density, Boundary conditions on wave functions, Normalization of wave function, quantum numbers.

UNIT II Quantum Mechanics-II

Time independent Schrodinger Equation: One dimensional potential well and barrier, Boundary conditions, bound and unbound states, Reflection and transmission coefficients for a rectangular barrier in one dimension, Explanation of Alpha Decay, Quantum phenomenon of tunnelling, Free particle in one dimensional box , Eigen functions and Eigen value of a free particle, one dimensional harmonic oscillator, Energy Eigen values from Hermite Differential Equation, wave function for ground state, particle in spherically symmetric potential, Rigid Rotator, orbital angular momentum, azimuthal quantum number and space quantization, principle quantum number, Hydrogen atom number.

UNIT III SOLID STATES-I

Crystal Structure and bonding: Crystalline and amorphous solids, Translational symmetry, lattice and basis, unit cell, Reciprocal lattice, Fundamental types of lattices (Bravias Lattice), Miller indices Lattice planes, simple cubic, Face centred cubic lattices, Laue and Bragg's equation, determination of crystal structure with X-rays, X-ray spectrometer, Ionic, covalent, metallic, Vander waals and hydrogen bonding, Band Theory of solids, periodic potential and Bloch Theorem, Kronig- penny model (Qualitative).

UNIT- IV SOLID STATE PHYSICS -2

Lattice structure and properties: Dulong Petit, Einstein and Debye theories of specific heat of solids. Elastic and atomic force constants, Dynamics of a chain of similar atoms and chain of two types of atoms, optical and acoustics modes, Electrical restivity, specific heat of electron, Wider mann-Franz law, Hall effect, Response of substances in magnetic field, dia-, para- and ferro magnetic materials, classical lagvin theory of dia and paramagnetic domains, Discussions of BH hysteresis.

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UNIT- V Nano Materials

Nano structures: Introduction to nanotechnology, structure and size dependent properties, 3D, 2D,1D, 0D nano structure materials and their density of states, surface and interface effects, Modelling of quantum size effect , Synthesis of nano particles –Bottom up and top down approach, Wet chemical Method, Nanolithography, Metals and semi conducting nano materials, essential differences in structural properties of bulk and nano materials (qualitative Description), Naturally occurring nano crystals, Applications of nano materials.

TEXT BOOKS:

1. Quantum Mechanics: By Satya Prakash and Swati Saluja, KNRN publication.
2. Introduction to Solid state Physics : Charles Kittel , Wiley edition.

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Department of Computer Science
A.P.S. University, Rewa (M.P.)
Syllabus for B.Sc. Computer Science (Honrs.) - First Semester (Session 2018-19)
(BSCSH-406) LAB I Problem Based on BSCSH 402 and BSCSH403

PART A

Choose any one project and do the following exercises for that project

a. Student Result Management System
b. Library management system
c. Inventory control system
d. Accounting system
e. Fast food billing system
f. Bank loan system
g. Blood bank system
h. Railway reservation system
i. Automatic teller machine
j. Video library management system
k. Hotel management system
l. Hostel management system
m. E-ticking
n. Share online trading
o. Hostel management system
p. Resource management system
q. Court case management system

1. Write the complete problem statement
2. Write the software requirement specification document
3. Draw the entity relationship diagram
4. Draw the data flow diagrams at level 0 and level 1
5. Draw use case diagram
6. Draw activity diagram of all use cases.
7. Draw state chart diagram of all use cases
8. Draw sequence diagram of all use cases
9. Draw collaboration diagram of all use cases
10. Assign objects in sequence diagram to classes and make class diagram .

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Department of Computer Science
A.P.S. University, Rewa (M.P.)
Syllabus for B.Sc. Computer Science (Honrs.) - First Semester (Session 2018-19)

(BSCSH-407) LAB II Problem Based on BSCSH 404 and BSCSH405

PART A

1. Measurement of susceptibility of paramagnetic solution (Quinck's Tube Method) .

2. To measure the Magnetic susceptibility of Solids.

3. To determine the Coupling Coefficient of a Piezoelectric crystal

. 4. To measure the Dielectric Constant of a dielectric Materials with frequency

5. To determine the complex dielectric constant and plasma frequency of metal using Surface Plasmon resonance (SPR)

6. To determine the refractive index of a dielectric layer using SPR

7. To study the PE Hysteresis loop of a Ferroelectric Crystal.

8. To draw the BH curve of iron using a Solenoid and determine the energy loss from Hysteresis.

9. To measure the resistivity of a semiconductor (Ge) crystal with temperature by fourprobe method (from room temperature to 150 oC) and to determine its band gap.

10. To determine the Hall coefficient of a semiconductor sample.

PART B Use C/C++ lab for solving the following problems based on Quantum Mechanics

1. **Solve the s-wave Schrodinger equation for the ground state and the first excited state of the hydrogen atom:**

$\frac{d^2y}{dr^2} = A(r)u(r), A(r) = \frac{2m}{\hbar^2}[V(r) - E]$ where $V(r) = -\frac{e^2}{r}$

Here, m is the reduced mass of the electron. Obtain the energy eigenvalues and plot the corresponding wavefunctions. Remember that the ground state energy of the hydrogen atom is = -13.6 eV. Take e = 3.795 (eVÅ)$^{1/2}$, hc = 1973 (eVÅ) and m = 0.511x10^{6}eV/c^2.

2. **Solve the s-wave radial Schrodinger equation for an atom:**

$\frac{d^2y}{dr^2} = A(r)u(r), A(r) = \frac{2m}{\hbar^2}[V(r) - E]$

Where m is the reduced mass of the system (which can be chosen to be the mass of an electron), for the screened coulomb potential

$$V(r) = -\frac{e^2}{r}e^{-r/a}$$

Find the energy (in eV) of the ground state of the atom to an accuracy of three significant digits. Also, plot the corresponding wavefunction. Take e = 3.795 (eVÅ)$^{1/2}$, m = 0.511x10^{6}eV/c^2, and a = 3 Å, 5 Å, 7 Å. In these units hc = 1973 (eVÅ). The ground state energy is expected to be above -12 eV in all three cases.

3. **Solve the s-wave radial Schrodinger equation for a particle of mass m:**

$\frac{d^2y}{dr^2} = A(r)u(r), A(r) = \frac{2m}{\hbar^2}[V(r) - E]$

For the anharmonic oscillator potential

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$$V(r) = \frac{1}{2}kr^2 + \frac{1}{3}br^3$$

for the ground state energy (in MeV) of the particle to an accuracy of three significant digits. Also, plot the corresponding wave function. Choose m = 940 MeV/c^2, k = 100 MeV fm^{-2}, b = 0, 10, 30 MeV fm^{-3} In these units, ch = 197.3 MeV fm. The ground state energy I expected to lie between 90 and 110 MeV for all three cases.

4 Solve the s-wave radial Schrodinger equation for the vibrations of hydrogen molecule:

$$\frac{d^2y}{dr^2} = A(r)u(r),\ A(r) = \frac{2\mu}{\hbar^2}[V(r) - E]$$

where μ is the reduced mass of the two-atom system for the Morse potential

$$V(r) = D(e^{-2\alpha r'} - e^{-\alpha r'}), \qquad r' = \frac{r - r_0}{r}$$

Find the lowest vibrational energy (in MeV) of the molecule to an accuracy of three significant digits. Also plot the corresponding wave function.
Take: m = 940x10^6eV/C^2, D = 0.755501 eV, α = 1.44, r_0 = 0.131349 Å

Laboratory based experiments:

5. Study of Electron spin resonance- determine magnetic field as a function of the resonance frequency
6. Study of Zeeman effect: with external magnetic field; Hyperfine splitting
7. To study the quantum tunnelling effect with solid state device, e.g. tunnelling current in backward diode or tunnel diode.

Reference Books

1. Advanced Practical Physics for students, B.L. Flint and H.T. Worsnop, 1971, Asia Publishing House.
2. Advanced level Physics Practicals, Michael Nelson and Jon M. Ogborn, 4th Edition, reprinted 1985, Heinemann Educational Publishers
3. A Text Book of Practical Physics, Indu Prakash and Ramakrishna, 11th Ed., 2011, Kitab Mahal, New Delhi
4. Elements of Solid State Physics, J.P. Srivastava, 2nd Ed., 2006, Prentice-Hall of India
5. Schaum's Outline of Programming with C++. J.Hubbard, 2000, McGraw-Hill Publications.
6. Numerical Recipes in C: The Art of Scientific Computing, W.H.Press et al., 3rdEdn., 2007, Cambridge University Press. □ Elementary Numerical Analysis, K.E.Atkinson, 3rdEdn., 2007, Wiley India Edition.
7. A Guide to MATLAB, B.R. Hunt, R.L. Lipsman, J.M. Rosenberg, 2014, 3rd Edn., Cambridge University Press
8. Simulation of ODE/PDE Models with MATLAB®, OCTAVE and SCILAB: Scientific and Engineering Applications: A. Vande Wouwer, P. Saucez, C. V. Fernández.2014 Springer ISBN: 978-3319067896
9. Scilab Image Processing: Lambert M. Surhone. 2010Betascript Publishing ISBN: 9786133459274A
10. Quantum Mechanics, Leonard I. Schiff, 3rdEdn. 2010, Tata McGraw Hill. □ Quantum Mechanics, Bruce Cameron Reed, 2008, Jones and Bartlett Learning

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Department of Computer Science
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Syllabus for B.Sc. Computer Science(Honrs.)- Third Semester (Session 2018-19)
(BSCSH-501) – FC V Entrepreneurship Development

Maximum Marks: 85 **Minimum Pass Marks: 28**

UNIT I

Entrepreneurship Development- Concept and importance, Functions of enterpriser, Goal Determination-Problems, challenges and solutions.

UNIT II

Project Proposal-Need and Objects, Nature of Organization, Production Management, Financial Management, Marketing Management, Consumer Management.

UNIT III

Role of regulatory institutions, Role of development organizations, Self employment oriented schemes, various growth schemes.

UNIT IV

Financial Management of project, Financial institution and their role, Capital estimation and arrangement, Cost and price determination, Accounting management.

UNIT V

Problem of entrepreneurs, Problem relating capitals, Problem relating registration, Administration problem and how to overcome from above problems.

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Department of Computer Science
A.P.S. University, Rewa (M.P.)
Syllabus for B.Sc. Computer Science (Honrs.) - Fifth Semester (Session 2018-19)
(BSCSH 502)JAVA PROGRAMMING

Maximum Marks: 85 **Minimum Pass Marks: 28**

UNIT I JAVA FUNDAMENTALS

Overview of Java, Fundamental Programming Structures, Strings – Objects Classes and Methods - Inheritance - Packages and Interfaces - Exception handling, Collections - Multithreading – Java I/O Streams, File Handling.

UNIT II INTERNET BASICS AND JAVA NETWORK PROGRAMMING

Internet Addressing, Browsers, Servers, Protocols: Web Application Architectures, Scripting Languages Search Engines, Web Services : Collective Intelligence, Mobile Web : Features of Web 3.0, TCP - UDP ,Inter Address and Ports ,Socket Programming ,Working with URLs - Internet Protocols simulation – HTTP, SMTP , POP , FTP, Remote Method Invocation.

UNIT III CLIENT-SIDE PROGRAMMING

Scripting for content structuring, form design, client side validation, dynamic page generation, adding interactivity, styles, using HTML, DHTML, XHTML, CSS, Java Script – XML - Document Type Definition ,XML Schema - Document Object Model, Presenting XML - Using XML Parsers: DOM and SAX - Evolution of AJAX J Query - Web applications with AJAX - AJAX J Query Framework - AJAX with PHP - AJAX with Databases – Java Applets – J Query – Swing

UNIT IV SERVER-SIDE PROGRAMMING

Types of servers - Configuring and Using Web servers, Setting up Databases, Java Database Connectivity -Handling form data, validation, querying databases, information retrieval, response generation, Session management - using PHP, Servlets, JSP.

UNIT V WEB APPLICATION DEVELOPMENT

Creating Interactive Websites - Search engines – cookies - Blogs - Social web applications - developing WIKI pages – Programming for the Mobile web.

TEXT BOOKS:

1. Herbert Schildt, "Java The Complete Reference", 8th Edition, McGraw-Hill Osborne Media, 2011.

2. Paul Deitel, "Internet & World Wide Web: How to Program", Prentice Hall, 4th Edition, 2007.

3. Cay S. Horstmann and Gary Cornell, "Core Java™, Volume I – Fundamentals" 8th Edition, Prentice Hall, 2007.

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Department of Computer Science
A.P.S. University, Rewa (M.P.)
Syllabus for B.Sc. Computer Science(Honrs.)- Fifth Semester (Session 2018-19)

(BSCSH 503) SYSTEMS PROGRAMMING

Maximum Marks: 85 **Minimum Pass Marks: 28**

UNIT I ASSEMBLER

Introduction: Introduction to Systems Software and machine architecture, Review of Computer Architecture, Machine Instructions and Programs, Assemblers –Basic Assembler Functions – Assembler Features – Assembler Design Options.

UNIT II LOADERS AND LINKERS

Loaders and Linkers: Basic Loader Functions, Machine-Dependent Loader Features, Machine-Independent Loader Features, Loader Design Options,Dynamic Linking and Loading, Object files, Contents of an object file, designing an object format, Null object formats, Code sections, Relocation ,Symbols and Relocation, Relocatable -a.out- ELF.

UNIT III MACROPROCESSORS AND EMULATORS

Macro processors: Basic Macro Processor Functions, Machine-Independent, Macro Processor Features, Macro Processor Design Options, Introduction to Virtual Machines (VM), Emulation, basic Interpretation, Threaded Interpretation, Interpreting a complex instruction set – binary translation.

UNIT IV VIRTUAL MACHINES

Virtual Machines: Pascal P-Code, VM Object-Oriented VMs, Java VM Architecture – Common Language Infrastructure, Dynamic Class Loading.

UNIT V ADVANCED FEATURES

Instruction Set Issues, Profiling, Migration, Grids , Code optimizations, Garbage Collection, Examples of real world implementations of system software.

TEXT BOOKS:

1. Leland L. Beck, "System Software", 3rd ed., Pearson Education, 1997.
2. John R. Levine, "Linkers & Loaders", Morgan Kauffman, 2003. 3. James E Smith and Ravi Nair, "Virtual Machines", Elsevier, 2005.
3. Srimanta Pal, " Systems Programming " , Oxford University Press, 2011. 2. John J.Donovan, " "Systems Programming", Tata McGraw-Hill, 1991

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Department of Computer Science
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Syllabus for B.Sc. Computer Science(Honrs.)- Fifth Semester (Session 2018-19)

BSCSH504CLOUD COMPUTING AND SERVICES

Maximum Marks: 85 **Minimum Pass Marks: 28**

UNIT I INTRODUCTION

Cloud-definition, benefits, usage scenarios, History of Cloud Computing - Cloud Architecture - Types of Clouds - Business models around Clouds – Major Players in Cloud Computing - issues in Clouds - Eucalyptus - Nimbus - Open Nebula, Cloud Sim.

UNIT II CLOUD SERVICES

Types of Cloud services: Software as a Service - Platform as a Service – Infrastructure as a Service - Database as a Service - Monitoring as a Service –Communication as services. Service providers- Google, Amazon, Microsoft Azure, IBM, Sales force.

UNIT III COLLABORATING USING CLOUD SERVICES

Email Communication over the Cloud - CRM Management - Project Management-Event Management - Task Management – Calendar - Schedules - Word Processing – Presentation – Spreadsheet - Databases – Desktop - Social Networks and Groupware.

UNIT IV VIRTUALIZATION FOR CLOUD

Need for Virtualization – Pros and cons of Virtualization – Types of Virtualization –System Vm, Process VM, Virtual Machine monitor – Virtual machine properties - Interpretation and binary translation, HLL VM - Hypervisors – Xen, KVM , VMWare, Virtual Box, Hyper-V. **UNIT V**

SECURITY, STANDARDS AND APPLICATIONS

Security in Clouds: Cloud security challenges – Software as a Service Security, Common Standards: The Open Cloud Consortium – The Distributed management Task Force – Standards for application Developers – Standards for Messaging – Standards for Security, End user access to cloud computing, Mobile Internet devices and the cloud.

TEXT BOOKS:

1. John Rittinghouse & James Ransome, Cloud Computing, Implementation, Management and Strategy, CRC Press, 2010.
2. Michael Miller, Cloud Computing: Web-Based Applications That Change the Way You Work and Collaborate Que Publishing, August 2008.
3. James E Smith, Ravi Nair, Virtual Machines, Morgan Kaufmann Publishers, 2006.

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Department of Computer Science
A.P.S. University, Rewa (M.P.)
Syllabus for B.Sc. Computer Science (Honrs.) - Fifth Semester (Session 2018-19)

(BSCCSH 505) DESIGN AND ANALYSIS OF ALGORITHMS

Maximum Marks: 85 **Minimum Pass Marks: 28**

UNIT–I

Primitive Data Structures, Operations on Data Structures; Integer, Real number, Character Information, Logical and Pointer Information, Algorithm analysis for time and space requirements. Non-primitive data structures, Storage structure for arrays, Operations on arrays, sparse matrices. Stacks: Definition and operations on stacks, Applications of stacks; Recursion, Polish expressions and their manipulations.

UNIT–II

Queues: Operations on queues, Priority queues; Linked storage representation, Pointers and linked allocation, Linked linear lists, Operations on linked lists, Circular linked list, Doubly linked lists, Application of linked lists. Dynamic Storage Management: Garbage collection, Compaction.

UNIT–III

Trees, Definitions and concepts of general trees and binary trees, Representation of binary trees, Binary tree representation of general tree, Binary tree traversal, Threaded binary trees, Operation on binary trees, Application of trees, Binary search trees

UNIT-IV

Introduction to Graphs, definition, terminology, directed, undirected and weighted graphs. Representation of graphs. Graph traversal: Breadth first search, Depth first search. Spanning trees, Minimal spanning tree. Application of graphs.

UNIT–V

Notation and concepts, Selection sort, Bubble sort, Merge sort, Heap sort, insertion sort, quick sort. Hash-table method, Hashing functions, Collision resolution techniques, Searching: Linear search, Binary search.

Text Books:

1. Horowitz & Sahni : Fundamentals of Data Structures, Comp. Sc. Press
2. S. Lipschutz : Schaum's Outline Series; Data Structures, Mc Graw Hill
4. Data Structures Using C; Tenenbaum, PHI
5. Data Structures Using Pascal, Tenenbaum, PHI
6. D. E. Knuth : The Art of Computer Programming, Addision Wesley
7. R. G. Dromey : How to solve it by computer

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Department of Computer Science
A.P.S. University, Rewa (M.P.)
Syllabus for B.Sc. Computer Science(Honrs.)- First Semester (Session 2018-19)
(BSCSH-506) LAB I Problem Based on BSCSH 502 and BSCSH503

PRACTICAL LIST for JAVA

1. WAP to find the average and sum of the N numbers Using Command line argument.
2. WAP to Demonstrate Type Casting.
3. WAP to find the number of arguments provide at runtime.
4. WAP to Test the Prime number.
5. WAP to calculate the Simple Interest and Input by the user.
6. WAP to create a Simple class to find out the Area and perimeter of rectangle and box using super and this keyword.
7. WAP to find G.C.D of the number.
8. WAP to design a class account using the inheritance and static that show all function of bank (withrowal, deposite).
9. WAP to find the factorial of a given number using Recursion.
10. WAP to design a class using abstract Methods and Classes.
11. WAP to design a String class that perform String Method(Equal,Reverse the string,change case).
12. WAP to handle the Exception using try and multiple catch block.
13. WAP that Implement the Nested try Statements.
14. WAP to Create a package that access the member of external class as well as same package.
15. WAP that import the user define package and access the Member variable of classes that Contained by Package.
16. WAP that show the partial implementation of Interface.
17. WAP to Handle the user defined Exception using throw keyword.
18. WAP to create a thread that Implement the Runable interface.
19. WAP to Implement Interthread communication.
20. WAP to create a class component that show controls and event handling on that controls.(math calc).
21. WAP to Draw the line, Rectangle, oval,text using the graphics method.
22. WAP to create a Menu using the frame.
23. WAP to create a Dialogbox.
24. WAP to Implement the flow layout And Border Layout.
25. WAP to Implement the GridLayout, CardLayout.
26. Wap of Awtdemo2 given by me.
27. WAP to demonstrate System clock.
28. WAP to create Frame that display the student information.

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Department of Computer Science
A.P.S. University, Rewa (M.P.)
Syllabus for B.Sc. Computer Science(Honrs.)- First Semester (Session 2018-19)

(BSCSH-507) LAB II Problem Based on BSCSH 504 and BSCSH505

Sr.	Practical Title
1	Implementation and Time analysis of sorting algorithms. Bubble sort, Selection sort, Insertion sort, Merge sort and Quicksort
2	Implementation and Time analysis of linear and binary search algorithm
3	Implementation of max-heap sort algorithm
4	Implementation and Time analysis of factorial program using iterative and recursive method
5	Implementation of a knapsack problem using dynamic programming.
6	Implementation of chain matrix multiplication using dynamic programming.
7	Implementation of making a change problem using dynamic programming
8	Implementation of a knapsack problem using greedy algorithm
9	Implementation of Graph and Searching (DFS and BFS).
10	. Implement prim's algorithm
11	Implement kruskal's algorithm.
12	Implement LCS problem.

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Department of Computer Science
A.P.S. University, Rewa (M.P.)
Syllabus for B.Sc. Computer Science (Honrs.) - Sixth Semester (Session 2018-19)
(BSCSH601)THEORY OF COMPUTATION

Maximum Marks: 85 **Minimum Pass Marks: 28**

UNIT I FINITE AUTOMATA

Introduction- Basic Mathematical Notation and techniques- Finite State systems – Basic Definitions – Finite Automaton ,DFA & NDFA, Finite Automaton with ϵ- moves ,Regular Languages, Regular Expression, Equivalence of NFA and DFA, Equivalence of NDFA"s with and without ϵ-moves, Equivalence of finite Automaton and regular expressions , Minimization of DFA, Pumping Lemma for Regular sets, Problems based on Pumping Lemma.

UNITII GRAMMARS

Introduction, Types of Grammar, Context Free Grammars and Languages, Derivations and Languages, Ambiguity, Relationship between derivation and derivation trees, Simplification of CFG, Elimination of Useless symbols, Unit productions, Null productions, Greibach Normal form, Chomsky normal form , Problems related to CNF and GNF.

UNIT III PUSHDOWN AUTOMATA

Pushdown Automata- Definitions, Moves, Instantaneous descriptions, Deterministic pushdown automata , Equivalence of Pushdown automata and CFL, pumping lemma for CFL , Problems based on pumping Lemma.

UNIT IV TURING MACHINES

Definitions of Turing machines – Models – Computable languages and functions – Techniques for Turing machine construction – Multi head and Multi tape Turing Machines – The Halting problem – Partial Solvability – Problems about Turing machine- Chomskian hierarchy of languages.

UNITV UNSOLVABLE PROBLEMS AND COMPUTABLE FUNCTIONS

Unsolvable Problems and Computable Functions ,Primitive recursive functions, Recursive and recursively enumerable languages ,Universal Turing machine, Measuring And Classifying Complexity: Tractable and Intractable problems, P and NP completeness, Polynomial time reductions.

TEXT BOOKS:

1. Hopcroft J.E., Motwani R. and Ullman J.D, "Introduction to Automata Theory, Languages and Computations", Second Edition, Pearson Education, 2008. (UNIT 1,2,3).
2. John C Martin, "Introduction to Languages and the Theory of Computation", Third Edition, Tata McGraw Hill Publishing Company, New Delhi, 2007. (UNIT 4, 5).
3. Mishra K L P and Chandrasekaran N, "Theory of Computer Science – Automata, Languages and Computation", Third Edition, Prentice Hall of India, 2004.
4. Harry R Lewis and Christos H Papadimitriou, "Elements of the Theory of Computation", Second Edition, Prentice Hall of India, Pearson Education, New Delhi, 2003.
5. Peter Linz, "An Introduction to Formal Language and Automata", Third Edition, Narosa Publishers, New Delhi, 2002.

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Department of Computer Science
A.P.S. University, Rewa (M.P.)
Syllabus for B.Sc. Computer Science (Honrs.) - Fifth Semester (Session 2018-19)

(BSCSH602) COMPUTER GRAPHICS

Maximum Marks: 85 **Minimum Pass Marks: 28**

UNIT I INTRODUCTION

Overview of graphics systems, Video display devices, Raster scan systems, Random scan systems, Graphics monitors and Workstations, Input devices, Hard copy Devices, Graphics Software; Output primitives, points and lines, line drawing algorithms, loading the frame buffer, line function; circle and ellipse generating algorithms; Pixel addressing and object geometry, filled area primitives.

UNIT II TWO DIMENSIONAL GRAPHICS

Two dimensional geometric transformations, Matrix representations and homogeneous coordinates, composite transformations; Two dimensional viewing, viewing pipeline, viewing coordinate reference frame, window-to-viewport coordinate transformation, Two dimensional viewing functions; clipping operations: point, line, and polygon clipping algorithms.

UNIT III THREE DIMENSIONAL GRAPHICS

Three dimensional concepts; Three dimensional object representations – Polygon surfaces- Polygon tables, Plane equations, Polygon meshes; Curved Lines and surfaces, Quadratic surfaces; Blobby objects; Spline representations – Bezier curves and surfaces -B-Spline curves and surfaces. Transformation and Viewing: Three dimensional geometric and modelling transformations: Translation, Rotation, Scaling, Composite transformations; three dimensional viewing – viewing pipeline, viewing coordinates, Projections, Clipping; Visible surface detection methods.

UNIT IV ILLUMINATION AND COLOUR MODELS

Light sources – basic illumination models – halftone patterns and dithering techniques; Properties of light – Standard primaries and chromaticity diagram; Intuitive colour concepts – RGB colour model – YIQ colour model – CMY colour model – HSV colour model – HLS colour model; Colour selection.

UNIT V ANIMATIONS & REALISM

ANIMATION GRAPHICS: Design of Animation sequences, animation function, raster animation, key frame systems, motion specification: morphing, tweening. Computer Graphics Realism: Tiling the plane, Recursively defined curves: Koch curves, C curves, Dragons ,space filling curves, fractals: Grammar based models , turtle graphics ,ray tracing.

TEXT BOOKS:

1. John F. Hughes, Andries Van Dam, Morgan and etal ,"Computer Graphics: Principles and Practice", , 3rd Edition, Addison- Wesley Professional,2013. (UNIT I, II, III, IV).
2. Donald Hearn and Pauline Baker M, "Computer Graphics", Prentice Hall, New Delhi, 2007 (UNIT V).

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Department of Computer Science

A.P.S. University, Rewa (M.P.)

Syllabus for B.Sc. Computer Science (Honrs.) - Fifth Semester (Session 2018-19)

(BSCSH603) .NET PROGRAMMING

Maximum Marks: 85 **Minimum Pass Marks: 28**

UNIT – I

.NET Technology overview, .NET framework and platform, Common Language Runtime, XML as the .NET "Meta Language", overview of Visual Studio IDE, New Object capabilities in Visual Basic, Modern Language capabilities added to Visual Basic, fitting Visual Basic into framework. CTS (Common type System), BCL(Base Class Library), CLS(Common Language Specification), HTML - Concepts of Hypertext, HTML elements and attributes, Hyperlinks, Backgrounds and Color controls, Different HTML tags, Table layout and presentation, Use of front size & Attributes, Frames and Forms in web pages, ASP & HTML Forms.

UNIT-II

Overview of ASP.NET framework, ASP.NET Controls, Applications Web servers, installation of IIS, Web forms,: server controls, client controls, Adding controls to a web form, Buttons, Text Box, Labels, Checkbox, Radio Buttons, List Box, image controls, data controls, file uploading & downloading, multi view, master page, Running a web Application, creating a multiform web project. Form Validation: Client side validation, server Side validation, Validation Controls: Required Field, Comparison, Range, Regular expression, custom validation and validation summary. Calendar control, Ad rotator Control, Internet Explorer Control, State management- View state, Session state, Application state.

UNIT-III

Architecture of ADO.NET, Connected and Disconnected Database, Create Connection using ADO.NET Object Model, Connection Class, Command Class, Data Adapter Class, Dataset Class. Display data on data bound Controls and Data Grid. Database Accessing on web applications: Data Binding concept with web, creating data grid, Binding standard web server controls. Display data on web form using Data bound controls, Use of SQL Server & MS-Access Database as backend, XML: writing datasets to XML, Reading datasets with XML. Web services: Introduction, remote method call using XML.

UNIT-IV

Overview of C#, C# & .NET, similarities & differences from JAVA, Structure of C# program, Language features: Type system, boxing-un boxing, flow controls, classes, interfaces, Serialization, Delegates, and Reflection.

UNIT-V

Web services: Introduction, State management- View state, Session state, Application state, SOAP, web service description language, concept of producer and consumer, building & consuming a web service, Web Application deployment, Caching, Threading Concepts, Creating Threads in .NET, managing threads, Thread Synchronization, Security features of .NET, Role based security & Code access security, Permissions. Text Books

Text Books:

1. *.Net 4.5 Programming 6-In-1," Black Book" By Kogent Learning Solutions Inc*
2. *Asp.Net 3.5 Black Book (Covers C# And Vb 2008 Codes) – Dreamtech Publication*
3. *The Complete Reference Asp.Net By Mathew Macdonald – Tmh*
4. *Professional Asp.Net- Wrox Publication*

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Department of Computer Science
A.P.S. University, Rewa (M.P.)
Syllabus for B.Sc. Computer Science (Honrs.) - Sixth Semester (Session 2018-19)
BSCSH 604 OPERATING SYSTEMS

Maximum Marks: 85 **Minimum Pass Marks: 28**

UNIT I OPERATING SYSTEMS OVERVIEW

Introduction to operating systems :Computer system organization, architecture :Operating system structure, operations :Process, memory, storage management ,Protection and security ,Distributed systems, Computing Environments ,Open-source operating systems ,OS services :User operating-system interface, System calls ,System programs, OS structure : OS generation, System Boot: Process concept, scheduling : Operations on processes ,Cooperating processes, Inter-process communication, Examples :Multithreading models, Thread Libraries ,Threading issues, OS examples.

UNIT II PROCESS MANAGEMENT

Basic concepts: Scheduling criteria, Scheduling algorithms, Thread scheduling , Multiple processor scheduling , Algorithm Evaluation: The critical section problem ,Peterson's solution, Synchronization hardware, Semaphores, Classic problems of synchronization Critical regions, Monitors, Synchronization examples ,Deadlocks , System model ,Deadlock characterization, Methods for handling deadlocks, Deadlock Prevention, Deadlock Avoidance, Deadlock detection, Recovery from deadlock

UNIT III STORAGE MANAGEMENT

Memory Management: Swapping, Contiguous memory allocation, Paging ,Segmentation ,Example: The Intel Pentium ,Virtual Memory: Background ,Demand paging ,Copy on write, Page replacement ,Allocation of frames ,Thrashing.

UNIT IV I/O SYSTEMS

File concept, Access methods, Directory structure, File-system mounting, Protection , Directory implementation , Allocation methods, Free-space management ,Disk scheduling Disk management, Swap-space management -Protection.

UNIT V CASE STUDY

The Linux System: History, Design Principles, Kernel Modules, Process Management Scheduling, Memory management, File systems, Input and Output, Inter-process Communication, Network Structure, Security, Windows 7:History,Design Principles, System Components, Terminal Services and Fast User, File system, Networking.

TEXT BOOK:

1. Abraham Silberschatz, Peter B. Galvin, Greg Gagne, "Operating System Concepts Essentials", John Wiley & Sons Inc., 2010. 50
2. Andrew S. Tanenbaum, "Modern Operating Systems", Second Edition, Addison Wesley, 2001.
3. D M Dhamdhere, "Operating Systems: A Concept-based Approach", Second Edition, Tata McGraw-Hill Education, 2007.
4. William Stallings, "Operating Systems: Internals and Design Principles", Seventh Edition, Prentice Hall, 2011. CS8452 S

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Department of Computer Science
A.P.S. University, Rewa (M.P.)
Syllabus for B.Sc. Computer Science (Honrs.) - Sixth Semester (Session 2018-19)
BSCSH 605 MINOR PROJECTS

Maximum Marks: 100

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Department of Computer Science
A.P.S. University, Rewa (M.P.)
Syllabus for B.Sc. Computer Science (Honrs.) - First Semester (Session 2018-19)
(BSCSH-606) LAB I Problem Based on BSCSH 601 and BSCSH603

1. Write a program to Enable Disable **Text Box** Programmatically in Asp .Net
2. Write a program to change color of Label text control programmatically in Asp .Net
3. Write a program to check empty query string in asp .net
4. Write a program to associate labels with asp controls so that when ever label is clicked it takes cursor to the associated label.
5. Write a program to display three images in a line. When any one of the images is clicked, it must be displayed. On clicking the displayed image it must be cleared.
6. Write a program that displays a button in green color and it should change into yellow when the mouse moves over it.
7. Write a program to display "**Welcome to Radiant**" in the form when the "click" button is clicked. The form title must be ASP.NET.
8. Write a program containing the following controls:

- A ListBox
- A Button
- An Image
- A Label

9. The **list box** is used to list items available in a store. When the user clicks on an item in the **list box**, its image is displayed in the image control. When the user clicks the button, the cost of the selected item is displayed in the control.
10. Write a program that gets user input such as the user name, mode of payment, appropriate credit card. After the user enters the appropriate values the Validation button validates the values entered.
11. Create a **Radio Button List** that displays the names of some flowers in two columns. Bind a label to the **Radio Button List** so that when the user selects an option from the list and clicks on a button, the label displays the flower selected by the user
12. Bind a **Check Box List** to the **pname** field of the product table in the master database so that all the name of the product is displayed as a series of **checkboxes**.
13. Write a C# Sharp program to compute the sum of the two given integer values. If the two values are the same, then returns triple their sum.
14. Write a C# Sharp program to get the absolute difference between n and 51. If n is greater than 51 return triple the absolute difference.
15. Write a C# Sharp program to check two given integers, and return true if one of them is 30 or if their sum is 30.
16. Write a C# Sharp program to check a given integer and return true if it is within 10 of 100 or 200.
17. Write a C# Sharp program to create a new string where 'if' is added to the front of a given string. If the string already begins with 'if', return the string unchanged.

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18. Write a C# Sharp program to remove the character in a given position of a given string. The given position will be in the range 0.. string length -1 inclusive.
19. Write a C# Sharp program to exchange the first and last characters in a given string and return the new string
20. Write a C# Sharp program to create a new string which is 4 copies of the 2 front characters of a given string. If the given string length is less than 2 return the original string.
21. Write a C# Sharp program to create a new string with the last char added at the front and back of a given string of length 1 or more.
22. Write a C# Sharp program to check if a given positive number is a multiple of 3 or a multiple of 7.
23. Write a C# Sharp program to create a new string taking the first 3 characters of a given string and return the string with the 3 characters added at both the front and back. If the given string length is less than 3, use whatever characters are there.
24. Write a C# Sharp program to check if a given string starts with 'C#' or not.
25. Write a C# Sharp program to check if one given temperatures is less than 0 and the other is greater than 100.
26. Write a C# Sharp program to check two given integers whether either of them is in the range 100..200 inclusive.
27. Write a C# Sharp program to check whether three given integer values are in the range 20..50 inclusive. Return true if 1 or more of them are in the said range otherwise false.
28. Write a C# Sharp program to check whether two given integer values are in the range 20..50 inclusive. Return true if 1 or other is in the said range otherwise false.
29. Write a C# Sharp program to check if a string 'yt' appears at index 1 in a given string. If it appears return a string without 'yt' otherwise return the original string.
30. Write a C# Sharp program to check the largest number among three given integers.

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Department of Computer Science
A.P.S. University, Rewa (M.P.)
Syllabus for B.Sc. Computer Science (Honrs.) - First Semester (Session 2018-19)

(BSCSH-607) LAB II Problem Based on BSCSH 602 and BSCSH604

PART A (Computer Graphics)

1. A program to draw a line using Digital Differential Analyzer (DDA) Algorithm
2. A program to draw a line using Bresenham's Line Algorithm (BLA) for lines with slopes negative and less than 1.
3. A program to draw a line using Bresenham's Line Algorithm (BLA) for lines with slopes positive and less than 1.
4. A program to draw a line using Bresenham's Line Algorithm (BLA) for lines with slopes positive and greater than 1.
5. A program to draw a line using Bresenham's Line Algorithm (BLA) for lines with slopes negative and greater than 1.
6. A program to draw a circle using Bresenham's Circle Algorithm.
7. . A program to draw a circle using MidPoint Circle Algorithm
8. A program to draw a circle using Trigonometric Method.
9. A program to draw a circle using Polynomial Method.
10. A program to draw an ellipse using MidPoint Ellipse Algorithm.
11. A program to draw an ellipse using Trigonometric Method.
12. A program to draw an ellipse using Polynomial Method.
13. A program to fill different types of geometric shapes using Flood Fill. Algo.
14. A program to fill different types of geometric shapes using Boundary Fill Algo.
15. A program to draw a C-Curve of nth order.

PART B

1. Implement Bankers Algorithm for Dead Lock Avoidance
2. Implement an Algorithm for Dead Lock Detection
3. Implement the all page replacement algorithms a) FIFO b) LRU c) LFU
4. Implement Shared memory and IPC.
5. Implement Paging Technique of memory management.
6. Implement Threading & Synchronization Applications

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Programme- MCA

Programme Outcomes

MCA programme is to impart quality education in Computer Science and its applications, so that students are well prepared to face the challenges of the highly competitive computer industry. The course structure ensures overall development of the student, while concentrating on imparting technical skills required for computer/IT profession.

Programme Specific Outcomes (PSOs):

The programme is designed to

PSO1: enable the students to apply the computing and soft skills acquired in the MCA program for designing and developing innovative applications for the betterment of the society.

PSO2 : Identify, formulate, research literature, and solve complex computing problem searching substantiated conclusions using fundamental principles of mathematics, computing sciences, and relevant domain disciplines.

PSO3: provide exposure to techniques that would enable the students to design, implement and evaluate IT solutions.

PSO4 : Demonstrate knowledge and understanding of the computing and management principles and apply these to one‟s own work, as a member and leader in a team to manage projects and in multidisciplinary environments.

PSO5 : Understand and commit to professional ethics and cyber regulations, responsibilities, and norms of professional computing practices.

PSO6 : Understand and assess societal, environmental, health, safety, legal, and cultural issues within local and global contexts, and the consequential responsibilities relevant to professional computing practices.

PSO7: To enable the students to meet the challenges of research and development in computer science and applications.

Course Outcomes:

Course Code 10601 : Computer Organization

On completion of this course, the student will be able to:

CO1: describe the basic organization of computer hardware.

CO2: represent and manipulate data – number systems, conversion between different number systems, perform binary arithmetic.

CO3: learn Boolean algebra, the language that simplifies communication in the world of computers. CO4: understand formal logic, and to reason/infer interesting outcomes; formally prove validity and soundness of a statement.

CO5: design simple combinational and sequential logic circuits - flip-flops, counters, shift registers, adders, subtractor, multiplexer, de-multiplexer, and Arithmetic/Logic unit.

CO6: design simple programs in assembly language.

Course Code 10602: Mathematical Foundation of Computer Science

On completion of this course, the student will be able to gain fundamental knowledge of:

CO1: mathematical structures (sets, relations and functions), and will be able to model real world situations mathematically.

CO2: principles of proportions & lattices.

CO3: Groups, Graphs and their applications in Computer Science.

CO4: discrete Numeric function and Recurrence relation.

CO5: growth of functions asymptotically.

Course Code 10603 : Operating System

On completion of this course, the student will be able to:

CO1 : describe basic functions of an Operating System.

CO2 : distinguish between different types of Operating Systems so as to use each of them most efficiently in the respective application areas.

CO3 : describe different techniques for managing computer resources like CPU, memory, file and devices.

CO4 : implement simple algorithms for managing computer resources

Course Code 10604 : Data Base Management System

On completion of this course, the student will be able to:

CO1 : understand basic database concepts, including the structure and operation of the relational data model.

CO2: apply logical database design principles, including E-R diagrams, conversion of ER diagrams to relations.

CO3: understand the concepts of integrity constraints, relational algebra, relational domain & tuple calculus, data normalization.

CO4: construct simple and moderately advanced database queries using Structured Query Language(SQL).

CO5: understand the emerging fields in database.

Paper Code-10605 : Problem Solving using C & C++

On completion of this course, the student will be able to:

CO1: learn basic concepts of problem solving using programming language.

CO2 : apply procedure oriented & object-oriented paradigm for problem solving.

CO3: select a suitable programming construct and in-built data structure for the given problem.

CO4: design, develop, document, and debug modular programs.

Paper Code-20601 : Data Structure & Analysis of Algorithms

On completion of this course, the student will be able to:

CO1: identify best suited data structure for the problem at hand.

CO2: identify the programming constructs to optimize the performance of the data structure in different scenarios.

CO3: describe the algorithm design techniques: iteration, divide and conquer, dynamic programming, greedy approach algorithms.

CO4: analyse the strengths and weaknesses of each technique.

CO5: identify and apply technique(s) suitable for simple applications.

CO6: appreciate that certain problems are too hard to admit fast solutions

Paper Code-20602 : Software Engineering Methodologies

On completion of the course, the student is expected to:

CO1: demonstrate an understanding of software engineering layered technology and software process models that provide a basis for the software development lifecycle.

CO2: describe software/system requirements and understand the processes involved in the discovery and documentation of these requirements.

CO3: practice system modeling techniques and object-oriented design for software development. CO4: test software using verification and validation, static analysis, reviews, inspections, and audits. CO5: appreciate software project management that includes project planning, project estimation techniques, risk management, quality management, and configuration management.

CO6: work as an individual and/or in team to develop and deliver quality software.

Paper Code-20603 : Computer Graphics & Visualization

After the completion of this course, students will be able to:

CO1 : understand the concept of image formation as realized by human visual System.

CO2 : illustrate the digitization process of images and related algorithms for drawing basic geometric figures in the 2D display devices.

CO3 : describe architecture of basic Input/ Output devices and their underlying working principles along with various primitives for drawing shapes.

CO4 : apply fundamental mathematics in producing spatial 3D-image of an object in an inherently 2D display device.

CO5 : understand the basics of OpenGL API and to manipulate graphics & images

Paper Code-206041 : Artificial Intelligence

On completion of this course, the student will be able to:

CO1: describe various approaches to Artificial Intelligence.

CO2: design intelligent agents.

CO3: describe and apply concepts, methods, and theories of search, heuristics, games, knowledge representation, planning.

CO4: acquire basics knowledge of Natural language processing.

CO5: understand the limitations of Artificial Intelligence techniques.

Paper Code-206042 : Cloud Computing

On completion of this course, the student will be able to:

CO1 : understand the architecture and infrastructure of cloud.

CO2 : learn the resource virtualization technique.

CO3 : build the appropriate file system and database.

CO4 : understand cloud security and challenges.

CO5 : evaluate third party cloud services for a real world problem.

Paper Code-20605 : JAVA Programming & Technologies

On completion of this course, the student will be able to:

CO1 : understand the object-oriented concepts – Classes, Objects, Inheritance, Polymorphism– for problem solving.

CO2 : design, implement, document, test, and debug a Java application consisting of multiple classes. CO3 : handle program exceptions.

CO4 : handle input/output through files.

CO5 : create Java applications with graphical user interface (GUI).

Paper Code-30601 : COMPILER DESIGN

On completion of this course, the student will be able to:

CO1: describe how different phases of a compiler work.

CO2: understand formal languages and automata.

CO3: implement top down and bottom up parsing algorithms.

CO4: use compiler tools like lex for implementing syntax directed translator.

CO5: learn implementation of block structure languages.

Paper Code-30602 : Computer Networking & Internet

On completion of this course, the student will be able to:

CO1 : learn the basics of Computer network Technologies.

CO2 : understand the fundamentals of types of transmission mediums and interfacing standards along with the current edge of the data communication techniques.

CO3 : learn flow control and error control techniques and Computer Network protocols at Conceptual level.

CO4 : learn WAN and TCP/IP.

CO5: learn the architecture & protocols of email and www.

Paper Code-306031 : Cryptography & Network Security

On completion of this course, the student will be able to:

CO1: learn classical encryption techniques and block cipher modes of operation.

CO2: implement a symmetric and asymmetric cryptographic methods

CO3 : learn Message authentication and Hash functions.

CO4: describe the role and implementation of digital signatures.

CO5 : understand IP security, Web security and system security.

Paper Code-306032 : Mobile Computing

On completion of this course, the student will be able to:

CO1 : learn multiple access technology for Wireless Communication .

CO2 : understand the concept of mobile data communication.

CO3 : learn Digital Cellular Systems and Standards.

CO4 : describe Components and working of Wireless LAN.

CO5 : understand Bluetooth technology & WLL architecture.

Paper Code-306033 : Software Quality Assurance

On completion of this course, the student will be able to:

CO1 : understand quality management processes.

CO2 : understand the importance of standards in the quality management process and role of SQA function in an organization.

CO3 : gain knowledge of software quality assurance.

CO4: understand the need and purpose of software testing.

CO5: learn the five views of software quality.

Paper Code-306034 : Internet Of Things

On completion of this course, the student will be able to:

CO1 : Understand the IOT Terminology and Technology.

CO2 : Describe IOT applications.

CO3 : Analyze Protocol standardization for IOT.

CO4 : Perform an analysis of IOT security issues.

CO5: Identify the role of cloud computing in IOT

Paper Code-306041 : DOT NET Technology

On completion of this course, the student will be able to:

CO1 : learn .NET Technology.

CO2 : understand the Visual Basic fundamentals.

CO3 : describe the classes, interfaces & arrays.

CO4 : learn creation of window forms & controls.

CO5 : understand file handling and graphics in VB.

Paper Code-306042 : Python Programming

On completion of this course, the student will be able to:

CO1 : understand different data types used in python.

CO2 : get better understanding of different types of control structures.

CO3 : use different data structures for different problem domains.

CO4 : apply different object oriented features for solving real world problems.

CO5 : develop different web based applications.

Paper Code-306043 : Data Warehousing and Mining

On completion of this course, the student will be able to:

CO1 : learn the data mining functionalities.

CO2 : understand and exhibit the basics of data warehousing and multi-dimensional modeling.

CO3 : describe data preprocessing.

CO4 : understand classification , clustering, frequent pattern analysis and regression .

CO5 : learn cluster analysis and DM tools.

Paper Code-306044 : Bigdata Analytics & Visualization

On completion of this course, the student will be able to:

CO1 : learn Big data and its characteristics.

CO2 : understand best practices for Big data Analytics and Integration tools.

CO3 : describe data modeling.

CO4 : learn elementary data analysis.

CO5 : understand basics of visualization.

Paper Code-30605 : Web Applications Development

On completion of this course, the student will be able to:

CO1 : understand web architecture.

CO2 : learn HTML & CSS.

CO3 : apply different modern technologies used for real-time client server application.

CO4 : develop different attractive and interactive web pages.

CO5 : learn basics of android application deployment environment.

AWADHESH PRATAP SINGH UNIVERSITY
REWA (MP) 486003

CBCS

CURRICULAM & SYLLABUS

(as per unified ordinance no. 14 of MP universities)

for

MASTER OF COMPUTER APPLICATION (MCA)

(AICTE Approved)

w.e.f. Session 2020-21

Course code : 060

www.apsurewa.ac.in

A. P. S. UNIVERSITY, REWA (MP)

MASTER OF COMPUTER APPLICATION (MCA)

SCHEME OF EXAMINATION(w.e.f. Session 2020-21)

Course code : 060

FIRST SEMESTER

Paper Code	Paper Name	Course Type	Credit	Theory Marks Max(Min)	CCE Marks Max(Min)	Total Marks (Min)
10601	Computer Organization	CC	4	60(21)	40(20)	100
10602	Mathematical Foundation of Computer Science	CC	4	60(21)	40(20)	100
10603	Operating System	CC	4	60(21)	40(20)	100
10604	DBMS	CC	4	60(21)	40(20)	100
10605	Problem Solving using C & C++	GE	4	60(21)	40(20)	100
10606	Lab I – DBMS	LAB	2			100(50)
10607	Lab II – Prog. in C & C++	LAB	2			100(50)
10608	Comprehensive Viva	Viva	4			100(50)
	TOTAL		28			800

SECOND SEMESTER

Paper Code	Paper Name	Course Type	Credit	Theory Marks Max(Min)	CCE Marks Max(Min)	Total Marks (Min)
20601	Data Structure and Analysis of Algorithms	CC	4	60(21)	40(20)	100
20602	Software Engineering	CC	4	60(21)	40(20)	100
20603	Computer Graphics & Visualization	CC	4	60(21)	40(20)	100
206041 206042	Elective I : (Any one from the following) • Artificial Intelligence • Cloud Computing	DCE	4	60(21)	40(20)	100
20605	Java Programming & Technologies	GE	4	60(21)	40(20)	100
20606	Lab I – Computer Graphics	LAB	2			100(50)
20607	Lab II – Java	LAB	2			100(50)
20608	Comprehensive Viva	Viva	4			100(50)
	TOTAL		28			800

THIRD SEMESTER

Paper Code	Paper Name	Course Type	Credit	Theory Marks Max(Min)	CCE Marks Max(Min)	Total Marks (Min)
30601	Compiler Design	CC	4	60(21)	40(20)	100
30602	Computer Networking & Internet	CC	4	60(21)	40(20)	100
306031 306032 306033 306034	Elective II : : (Any one from the following) • Cryptography & Network Security • Mobile Computing • Software Quality Assurance • Internet of Things	DCE	4	60(21)	40(20)	100
306041 306042 306043 306044	Elective III : : (Any one from the following) • Dot Net Technology • Python Programming • Data Warehousing & Mining • Big Data Analytics & Visualization	DCE	4	60(21)	40(20)	100
30605	Web Applications Development	GE	4	60(21)	40(20)	100
30606	Lab I – Based on Elective III	LAB	2			100(50)
30607	Lab II – Web Applications Development	LAB	2			100(50)
30608	Comprehensive Viva	Viva	4			100(50)
	TOTAL		28			800

FOURTH SEMESTER

Paper Code	Paper Name	Course Type	Credit	Theory Marks Max(Min)	CCE Marks Max(Min)	Total Marks (Min)
40601	Major Project / Dissertation Evaluation	CC	16			400(200)
40602	Major Project / Dissertation Internal Evaluation	CC	4			100(50)
40603	Comprehensive Viva	Viva	4			100(50)
	TOTAL		24			600

CC = Core Course, GE = Generic Elective, DCE = Discipline Centric Elective

TOTAL CREDITS : 28+28+28+24=108 Grand Total : 800+800+800+600=3000

Programme Objectives (POs):

Master of Computer Applications (MCA) is a full-time four-semester course, which includes one semester of project work in the fourth semester. The objective of MCA programme is to impart quality education in Computer Science and its applications, so that students are well prepared to face the challenges of the highly competitive computer industry. The course structure ensures overall development of the student, while concentrating on imparting technical skills required for computer/IT profession.

Programme Specific Outcomes (PSOs):

The programme is designed to

PSO1: enable the students to apply the computing and soft skills acquired in the MCA program for designing and developing innovative applications for the betterment of the society.

PSO2 : Identify, formulate, research literature, and solve complex computing problem searching substantiated conclusions using fundamental principles of mathematics, computing sciences, and relevant domain disciplines.

PSO3: provide exposure to techniques that would enable the students to design, implement and evaluate IT solutions.

PSO4 : Demonstrate knowledge and understanding of the computing and management principles and apply these to one's own work, as a member and leader in a team to manage projects and in multidisciplinary environments.

PSO5 : Understand and commit to professional ethics and cyber regulations, responsibilities, and norms of professional computing practices.

PSO6 : Understand and assess societal, environmental, health, safety, legal, and cultural issues within local and global contexts, and the consequential responsibilities relevant to professional computing practices.

PSO7: To enable the students to meet the challenges of research and development in computer science and applications.

MCA I Sem - Course Code 10601 : Computer Organization

Credit 4; Theory Max/Min(60/21), CCE Max/Min(40/20)

Course Outcomes:
On completion of this course, the student will be able to:
CO1: describe the basic organization of computer hardware.
CO2: represent and manipulate data – number systems, conversion between different number systems, perform binary arithmetic.
CO3: learn Boolean algebra, the language that simplifies communication in the world of computers.
CO4: understand formal logic, and to reason/infer interesting outcomes; formally prove validity and soundness of a statement.
CO5: design simple combinational and sequential logic circuits - flip-flops, counters, shift registers, adders, subtractor, multiplexer, de-multiplexer, and Arithmetic/Logic unit.
CO6: design simple programs in assembly language.

UNIT I

Computer Organization : Digital and Analog computers, Major components of a digital computer, Basic concepts of IT, concepts of Data & Information, data processing, history of computers (generations, type of languages), I/O devices, Storage devices, Software's Types & its uses, Binary Number System and Conversion, Complements, Signed Binary Numbers, Binary Codes, Error detecting Code, Introduction of Assembler, Compiler & Interpreters

UNIT II

Computer Arithmetic : Binary representation of Negative Integers using 2's complement and Signed magnitude representation, Fixed point Arithmetic operations on Positive and Signed (Negative) Integers like addition, subtraction, multiplication, Booth's algorithm for multiplication, Division of positive and negative binary numbers. Boolean Algebra and Logic Gates: Basic Definitions, Basic Theorems and properties of Boolean algebra, Boolean Functions, Digital Logic gates.

UNIT III

Gate-Level Minimization : The K-Map Method, 3 and 4 variable K-Map, Combinational Circuits, Decoders, Encoders, Multiplexers and Demultiplexers, Sequential circuits, Latches, Flip Flops : SR, D, JK, T; Master Slave JK Flip flop, Integrated Circuits; Shift Registers- Serial in Serial out, Serial in Parallel out, Parallel in Serial out and Parallel in Parallel out. Designing of Asynchronous (Ripple) Counters, Design of Synchronous Counters.

UNIT IV

Introduction of 8085 Microprocessor : Architecture of 8085 processor, Register Architecture : Accumulator, Register and Flag Register, Addressing Modes: Direct memory addressing mode and Register direct Addressing Mode, Memory addressing capability of a CPU, Word length of a computer, Processing speed of a CPU, Working of CPU, Buses, Block Diagram of 8085.

UNIT V

Introduction to Assembly Language Programming: Various Instructions Classifications: instruction Format, Opcode, Operand and Hex code. Instruction Operation Status, Various Instruction Sets: Data Transfer Group Instructions, Arithmetic Group Instructions, Logical Group Instruction, Branch Group Instructions: Conditional , Unconditional and Machine control Instructions.

Books Recommended :

1. Microprocessor Architecture, Programming and Applications with 8085/8080 by Ramesh S. Gaonkar.
2. Digital Design by M. Morris Mano. Publication: PHI Eastern economy edition.
Reference Book(s):
1. Fundamentals of Computers by B Ram Publication : PHI , Fourth edition
2. Microprocessor and Its applications by R Theagrajan,S Dhanapal
3. Computer Architecture By Dr. Rajkamal. Publication: TMH Indian Special edition 2006.

MCA I Sem-Course Code 10602:Mathematical Foundation of Computer Science

Credit 4; Theory Max/Min(60/21), CCE Max/Min(40/20)

Course Outcomes:

On completion of this course, the student will be able to gain fundamental knowledge of:

CO1: mathematical structures (sets, relations and functions), and will be able to model real world situations mathematically.

CO2: principles of proportions & lattices.

CO3: Groups, Graphs and their applications in Computer Science.

CO4: discrete Numeric function and Recurrence relation.

CO5: growth of functions asymptotically.

UNIT-I

Sets, Relations and Functions: Sets, Subsets, Power sets, Complement, Union and Intersection, Demorgan's law, Cartesian products, Relations, relational matrices, properties of relations, equivalence relation, functions, Injection, Surjection and Bijective mapping, Composition of functions, the characteristic functions and Mathematical induction

UNIT-II

Proportions & Lattices : Proposition & prepositional functions, Logical connections, Truth-values and Truth Table, the algebra of prepositional functions-the algebra of truth values-Applications (switching circuits, Basic Computer Components); Partial order set, Hasse diagrams, upper bounds, lower bounds, Maximal and minimal element, first and last element, Lattices, sub lattices, Isotonicity, distributive inequality, Lattice homomorphism, lattice isomorphism, complete lattice, complemented lattice, distribution lattice

UNIT-III

Groups : Binary Composition, Algebraic Structure, Algebraic properties or Group axioms, Monoid, Semigroup, Groupoid, Groups, Abelian Groups, Finite and Infinite Group, Integral power of an element, order of an element of a group, Transformations, Permutation and permutations group, Cyclic permutation, Even and odd permutations, Subgroups of a group, Cosets, Lagrange theorem, Cyclic groups, Normal subgroups

UNIT-IV

Graphs: Finite graphs, incidence and degree, isomorphism, sub graphs and union of graphs, connectedness, walk, paths, and circuits Eulerian graphs, tree properties of trees, pendant vertices in tree, center of tree, spanning trees and cut vertices, binary tree, matrix representation of graph, incidence and adjacency matrix and their properties, applications of graphs in computer science

UNIT-V

Discrete Numeric function and Recurrence relation: Introduction to discrete numeric functions and generating functions, introduction to recurrence relations and recursive algorithms, linear recurrence relations with constant coefficients, homogeneous solutions, particular solutions and total solutions

Books Recommended :

1. J.P.Trembley & R.P.Manohar "Discrete Mathematical Structure with applications to Computer Science".
2. M. K. Gupta, Discrete Mathematics, Krishna Prakashan Media (P) Ltd.
3. Kenneth H. Rosen-203 "Discrete Math & its Applications"
4. K.A. Ross and C.R.B. Writht "Discrete Mathematics"
5. Bernard Kolman & Robert C. Busby "Discrete Mathematical Structures for Computer Science".

MCA I Sem-Course Code 10603 : Operating System

Credit 4; Theory Max/Min(60/21), CCE Max/Min(40/20)

Course Outcomes:

On completion of this course, the student will be able to:

CO1 : describe basic functions of an Operating System.

CO2 : distinguish between different types of Operating Systems so as to use each of them most efficiently in the respective application areas.

CO3 : describe different techniques for managing computer resources like CPU, memory, file and devices.

CO4 : implement simple algorithms for managing computer resources.

UNIT-I

Introduction : Evolution of operating systems (History of evolution of OS with the generations of computers), Types of operating systems, Multitasking, Timesharing, Multithreading, Multiprogramming and Real time operating systems, Operating system concepts and structure, Layered Operating Systems, Monolithic Systems. Processes : The Process concept, The process control block, Systems programmer's view of processes, Operating system services for process management, Scheduling algorithms and types.

UNIT-II

Memory Management : Memory management without swapping or paging, Concepts of swapping and paging, Page replacement algorithms namely Least recently used, Optimal page replacement, Most recently used, Clock page replacement, First in First out (This includes discussion of Belady's anomaly and the category of Stack algorithms), Modeling paging algorithms, Design issues for paging system, Segmentation, Segmented Paging, Paged Segmentation

UNIT-III

Inter-process Communication and Synchronization : The need for inter-process synchronization, Concept of mutual exclusion, binary and counting semaphores, hardware support for mutual exclusion, queuing implementation of semaphores, Classical problems in concurrent programming, Dining Philosopher's problem, Bounded Buffer Problem, Sleeping Barber Problem, Readers and Writers problem, Critical section, critical region and conditional critical region, Monitors and messages. Deadlocks: Concepts of deadlock detection, deadlock prevention, deadlock avoidance; Banker's Algorithm

UNIT-IV

File System: File systems, directories, file system implementation, security protection mechanisms; Input/output: Principles of I/O Hardware: I/O devices, device controllers, direct memory access, Principles of I/O software: Goals interrupt handlers, device drivers, and device independent I/O software. User space I/O Software. Disks: Disk hardware, Disk scheduling algorithms (namely First come first serve, shortest seek time first, SCAN, C-SCAN, LOOK and C-LOOK algorithms) Error handling, track-at-a-time caching, RAM Disks. Clocks: Clock hardware, memory-mapped terminals, I/O software.

UNIT-V

Processes and Processors in Distributed Systems : Threads, System models, processor allocation, scheduling; Distributed File Systems : Design, Implementation, and trends; Performance Measurement, monitoring and evaluation Introduction, important trends affecting performance issues, why performance monitoring and evaluation are needed, performance measures, evaluation techniques, bottlenecks and saturation, feedback loops. Case Studies: WINDOWS and LINUX /UNIX Operating System.

Books Recommended :

1. Deitel, H.M. "An Introduction to Operating Systems". Addison Wesley Publishing Company 1984.
2. Milenkovic, M., "Operating Systems - concepts and Design" McGraw Hill International Edition-Computer Science series 1992.
3. Galvin P., J.L. Abraham Silberschatz. "Operating System Concepts". John Wiley & Sons Company, 1989.
4. Tanenbaum, A.S. "Modern Operating System", Prentice Hall of India Pvt. Ltd.1995.
5. William Stallings "Operating Systems" , Prentice Hall of India Pvt. Ltd.

MCA I Sem - Course Code 10604 :Data Base Management System

Credit 4; Theory Max/Min(60/21), CCE Max/Min(40/20)

Course Outcomes:

On completion of this course, the student will be able to:

CO1 : understand basic database concepts, including the structure and operation of the relational data model.

CO2: apply logical database design principles, including E-R diagrams, conversion of ER diagrams to relations.

CO3: understand the concepts of integrity constraints, relational algebra, relational domain & tuple calculus, data normalization.

CO4: construct simple and moderately advanced database queries using Structured Query Language(SQL).

CO5: understand the emerging fields in database.

UNIT-I

Introduction: Advantage of DBMS approach, various view of data, data independence, schema and subschema, primary concepts of data models, Database languages, transaction management, Database administrator and users, data dictionary, overall system architecture. **ER model**: basic concepts, design issues, mapping constraint, keys, ER diagram, weak and strong entity sets, specialization and generalization, aggregation, inheritance, design of ER schema, reduction of ER schema to tables.

UNIT-II

Domains, Relations and Keys: domains, relations, kind of relations, relational database, various types of keys, candidate, primary, alternate and foreign keys. **Relational Algebra & SQL**: The structure, relational algebra with extended operations, modifications of Database, idea of relational calculus, basic structure of SQL, set operations, aggregate functions, null values, nested sub queries, derived relations, views, modification of Database, join relations, DDL in SQL, Introduction of Database Design, SDLC, DDLC, Automated Design Tools

UNIT-III

Functional Dependencies and Normalization: basic definitions, trivial and non trivial dependencies, closure set of dependencies and of attributes, irreducible set of dependencies, introduction to normalization, non loss decomposition, FD diagram, first, second, third Normal forms, dependency preservation, BCNF, multivalued dependencies and fourth normal form, Join dependency and fifth normal form.

UNIT-IV

Database Integrity: general idea. Integrity rules, domain rules, attribute rules, relation rules, Database rules, assertions, triggers, integrity and SQL. **Transaction, concurrency and Recovery**: basic concepts, ACID properties, Transaction states, implementation of atomicity and durability, concurrent executions, basic idea of serializability, basic idea of concurrency control, basic idea of deadlock, failure classification, storage structure types, stable storage implementation, data access, recovery and atomicity- log based recovery, deferred Database modification, immediate Database modification, checkpoints. **Distributed Database**: basic idea, distributed data storage, data replication, data fragmentation horizontal, vertical and mixed fragmentation

UNIT-V

Emerging Fields in DBMS, Object oriented Databases, Data Warehousing, Database on www, multimedia Databases-difference with conventional DBMS, issues, similarity based retrieval, continuous media data, multimedia data formats, video servers. Storage structure and File organizations, Indexing, Network and hierarchical models, DBTG model, implementations, tree structure diagram, implementation techniques, comparison of the three models, Basics of Decision Support System, Introduction and Installation of MYSQL, SQLLITE, MSSQL, MongoDB, PHP Introduction, Installing PHP, PHP and MYSQL, Case Study : Database Design of an Internet Bookshop

Books Recommended :

1. A Silberschatz, H.F Korth, Sudersan “Database System Concepts” –, MGH Publication.
2. C.J Date “An introduction to Database Systems” –6th ed.
3. Elmasri & Navathe “Fundamentals of Database systems” – III ed.
4. B.C. Desai. “An introduction to Database systems” BPB
5. Raghurama Krishnan “Database Systems” TMH
6. Shio Kumar Singh, “Database Systems”, PEARSON

MCA I Sem - Paper Code-10605 : Problem Solving using C & C++

Credit 4; Theory Max/Min(60/21), CCE Max/Min(40/20)

Course Outcomes:

On completion of this course, the student will be able to:

CO1: learn basic concepts of problem solving using programming language.

CO2 : apply procedure oriented & object-oriented paradigm for problem solving.

CO3: select a suitable programming construct and in-built data structure for the given problem.

CO4: design, develop, document, and debug modular programs.

UNIT–I

C language programming: Flowchart, Algorithm, Introduction to C language, Simple I/O functions (scanf, printf, gets, puts, getchar, getche, getch); Data types in C, Assignment statement, Arithmetic, Operators, Precedence of operators. **Control structure:** The if-else statements, nesting of if-else, switch statement, Loops: while and do-while loop, the for loop, Functions: User defined functions, Returning a value from a function, Local and Global variables, Parameters, Type declaration of a function, Functions with more than one parameters, Storage classes

UNIT–II

Arrays & Pointers : Declaration and initialization; the break and continue statement; String and Character arrays, operations with arrays; searching in array (linear and binary). Sorting an array, String & String functions: sprintf, strcpy, scanf, strcat, strlen, malloc, strcmp. Two dimensional array. **Pointers:** The concept of pointers, pointer arithmetic, passing pointers as parameters, pointer & arrays, Pointer to pointers, Array of pointers to strings.

UNIT–III

Structures: The concept of structure, Initializing, Arrays of structures, Arrays within structures, Structures within Structures, passing structures to function; unions.

Files: Files in 'C', Modes for files; Functions used in files (getc, putc, fopen, fclose, fscanf, fread, fwrite, fprintf, fseek, ftell, rewind), text versus binary files; command line arguments; Preliminaries of C preprocessor Directives, (#define, #undef, #include, #ifdef, #ifndef, #endif, #else, #if).

UNIT–IV

Introduction to OOP : Basic concepts of OOP : Object, Classes, Inheritence, Polymorphism, Reusability; Benefits & applications of OOP, Characters used in C++. Basic data types, user defined data types, use of conditional and looping statements in C++. Arrays in C++. Reference variable, **Functions** : prototypes, default arguments, const arguments in functions, Inline functions, call by value, call by reference, function overloading.

Classes and objects : Declaring a class, defining an object, data hiding and encapsulation, public and private data members & functions, friend function. Pointer to data member, pointer to member function and pointer to object, virtual function.

Unit-V

Constructors & Destructors: Parametrized constructors, multiple constructor in a class, copy constructors, object as function arguments, returning objects, the this pointer, memory allocation for objects. **Operator Overloading** : Unary and binary operators. **Inheritence** : Inheritence and derivation, single, multilevel, multiple, hierarchical & hybrid inheritence, Overriding functions, virtual function; Manipulators, managing output with manipulators, user defined manipulators with arguments; **Streams** : C^{++} streams, stream classes;. Files : Classes for file stream operations, file I/O with streams.

Books Recommended:

1. Gottfried, Programming with C, TMH
2. E. Balagurusamy, Programming in ANSI C, TMH
3. Y. Kanetkar, Let us C, BPB
4. Y. Kanetkar, Let us C++, BPB
5. E. Balagurusamy, Object Oriented Programming with C^{++} , TMH
6. Robert Lafore, Object Oriented Programming in Turbo C^{++} , Galgotia Publications

MCA II Sem-Paper Code-20601 : Data Structure & Analysis of Algorithms

Credit 4; Theory Max/Min(60/21), CCE Max/Min(40/20)

Course Outcomes:

On completion of this course, the student will be able to:

CO1: identify best suited data structure for the problem at hand.

CO2: identify the programming constructs to optimize the performance of the data structure in different scenarios.

CO3: describe the algorithm design techniques: iteration, divide and conquer, dynamic programming, greedy approach algorithms.

CO4: analyse the strengths and weaknesses of each technique.

CO5: identify and apply technique(s) suitable for simple applications.

CO6: appreciate that certain problems are too hard to admit fast solutions

Unit – I

Data Structure : types, operations on data structures, Algorithm analysis, time space complexities; Stack : Contiguous implementation of stack, PUSH & POP, applications of stack : Various polish notations – infix, prefix, postfix, conversion using stack; Queue : implementation of queue, operations on queue, priority queue, Linear queue and circular queue, various operation on queue.

Unit – II

General List: list and it's contiguous& linked implementation, it's drawback; singly linked list-operations on it; doubly linked list-operations on it; circular linked list; applications of linked list,

Trees : Definition – height, depth, order degree, etc; Binary Tree, complete binary tree, implementation of Binary tree, Tree traversal algorithms – preorder, inorder & post order, Binary search tree, operations on binary tree, application of binary tree.

Unit – III

Graph: related definition, implementation of graph, traversal algorithms - depth first search, breadth first search; minimum spanning tree, shortest path algorithms, Searching : Sequential search, binary search, indexed sequential search, Hashing, hash methods, collisions & its resolution techniques. Sorting : bubble sort, selection sort, heap sort, insertion sort and tree sort

Unit – IV

Divide and Conquer: Structure of divide and conquer algorithm, Merge sort, Quick sort; Asymptotic Notation; Greedy Method: Overview of the greedy paradigm examples of exact optimization solution(minimum cost spanning tree), Approximate solution (Knapsack problem), Single source shortest paths. Branch and bound; 0/1 Knapsack problem, Traveling Salesman Problem.

UNIT- V

Dynamic programming: Overview, Applications: Shortest path in graph, Traveling salesman Problem, longest Common sequence. Back tracking: Overview, 8-queen problem, and Knapsack problem, Computational complexity, Polynomial and non polynomial time complexity, NP hard and NP Complete Classes.

Books Recommended :

1. Kruse R.L. Data Structures and Program Design in C; PHI
2. Aho "Data Structure & Algorithms"
.3. Trembly "Introduction to Data Structure with Applications".
4. TennenBaum A.M. & others: Data Structures using C & C++; PHI
5. Horowitz & Sawhaney: Fundamentals of Data Structures, Galgotia Publishers.
6. Ullman "Analysis and Design of Algorithm" TMH
7. T. H. Cormen, Leiserson , Rivest and Stein, "Introduction of Computer algorithm," PHI

MCA II Sem-Paper Code-20602 : Software Engineering Methodologies

Credit 4; Theory Max/Min(60/21), CCE Max/Min(40/20)

Course Outcomes:

On completion of the course, the student is expected to:

CO1: demonstrate an understanding of software engineering layered technology and software process models that provide a basis for the software development lifecycle.

CO2: describe software/system requirements and understand the processes involved in the discovery and documentation of these requirements.

CO3: practice system modeling techniques and object-oriented design for software development.

CO4: test software using verification and validation, static analysis, reviews, inspections, and audits.

CO5: appreciate software project management that includes project planning, project estimation techniques, risk management, quality management, and configuration management.

CO6: work as an individual and/or in team to develop and deliver quality software.

UNIT -I

System concepts and Information system environment: The system concept, characteristics of system, elements of system, The System Development Life Cycle, The Role of System Analyst. Introduction system planning & initial investigation, various information gathering tools, feasibility study, structures tools of system analysis, various methods of process design, form design methodologies, introduction to information system testing, quality assurance.

UNIT -II

Software Process, Product and Project: The Product : Software, Software Myths, The process : Software Engineering : A Layered Technology, Software Process Models, The Linear Sequential Model, The Prototyping Model, The RAD Model, Evolutionary Software Process Models, Component – Based Development, Fourth Generation Techniques, Software process and Project Metrics : Software measurement

UNIT-III

Software Project Planning and Design: Software Project Planning : Project planning objectives, Decomposition Techniques, Empirical estimation models, The Make/Buy Decision, Risk analysis. Software Design: Design Principles, Cohesion & Coupling, Design notation and specification, structure design methodology.

UNIT-IV

Software Quality Assurance and Testing : Software Quality Assurance : Quality Concepts, The Quality Movement, Software Quality Assurance, Software Reviews, Formal Technical Reviews, Formal Approaches to SQA, Statistical Software Quality Assurance, Software Reliability, Mistake Proofing for Software, Introduction to ISO standard. Testing Strategies: A strategic approach of software testing strategic issues, unit testing, integration testing, validation testing, system testing, the art of debugging. OOA, OOD.

UNIT-V

Advanced Topics: MIS & DSS : Introduction to MIS, long range planning, development and implementation of an MIS, applications of MIS in manufacturing sector and in service sector. Decision Suppost System concepts, types of DSS. Object Oriented Software Engineering: Object Oriented Concepts, Identifying the Elements of an Object Model, Management of Object Oriented Software Projects. CASE tools, Re-engineering.

Books Recommended :

1. R. S. Pressman, “Software Engineering – A practitioner’s approach”, 6th ed., McGraw Hill Inc
2. Pankaj Jalote “Software Engg” Narosa Publications.
3. Ian Sommerville : Software Engineering 6/e (Addison-Wesley)
4. Richard Fairley : Software Engineering Concepts (TMH)
5. Elis Awad, "System Analysis & Design", Galgotia publications
6. Hoffer “ Modern System Analysis & Design” 3e, Pearson Edition

MCA II Sem-Paper Code-20603 : Computer Graphics & Visualization

Credit 4; Theory Max/Min(60/21), CCE Max/Min(40/20)

Course Outcomes:

After the completion of this course, students will be able to:

CO1 : understand the concept of image formation as realized by human visual System.

CO2 : illustrate the digitization process of images and related algorithms for drawing basic geometric figures in the 2D display devices.

CO3 : describe architecture of basic Input/ Output devices and their underlying working principles along with various primitives for drawing shapes.

CO4 : apply fundamental mathematics in producing spatial 3D-image of an object in an inherently 2D display device.

CO5 : understand the basics of OpenGL API and to manipulate graphics & images.

UNIT-I

Computer Graphics : definition, classification & applications, Development of Hardware & Software for Computer Graphics. Display devices, Hard copy devices. Interactive Input devices, display processor, Line drawing; various algorithms and their comparison, circle generation-Bresenham's mid point circle drawing algorithm, mid point ellipse drawing algorithm.

UNIT-II

Attributes of output primitives, line style, color and intensity, Area filling algorithms, Scan line algorithm, boundary fill, flood fill algorithm, Antialiasing techniques. Two dimensional transformations; translation, scaling, rotation, reflection sheering, composite transformation, transformation commands, character generation.

UNIT-III

Viewing coordinates, Window, view port, clipping, Window to view port transformation, line clipping algorithm; Cohen Sutherland, polygon clipping; Sutherland Hodgman algorithm, 3D clipping : Normalized view volumes, view port clipping, clipping in homogeneous coordinates. Illumination model: Light sources, diffuse reflection specular reflection, reflected light, intensity levels, surface shading; phong shading gouraud shading, color models like RGB, YIQ, CMY, HSV etc.

UNIT-IV

3-D Viewing: Three-dimensional concepts, 3D display techniques, 3D representation polygon & curved surfaces. Design of curves & surfaces- Bezier's Method, B-spline method, 3D transformation transition, scaling, composite transformation rotation about arbitrary axis, projections: Parallel & Perspective, Hidden surface and line removal; back face removal, depth buffer and scan line methods.

UNIT-V

Introduction to OPENGL- Points, Lines – Specifying a 2D World Coordinate, Reference Frame in OpenGL- OpenGL Point Functions, Line Functions, Polygon Fill Area Functions, Vertex Arrays - Line Drawing Algorithms - Circle Generation Algorithm, Filled Area Primitives, OpenGL fill Area Functions - Scan Line Polygon Filling Algorithms – Boundary Fill - Flood Fill Algorithms.

Books Recommended :

1. Donald Hearn and Pauline Baker, "Computer Graphics with OpenGL ", Third Edition, Prentice Hall of India, 2009.
2. S. Harrington – "Computer Graphics - a Programming approach" (2nd ed) McGrawhill.
3. New Mann & Sprovl- "Principles of interactive computer graphics" (2nd ed) McGrawhill.
4. Roger S. David "Procedural Elements for Computer Graphics", McGraw Hill.
5. Roger S David "Mathematical Elements for Computer Graphics", McGraw Hill.
6. Foley & Vandan "Computer Graphics Principles & Practice in "C" "Addision Wesly.

MCA II Sem-Paper Code-206041 : Artificial Intelligence

Credit 4; Theory Max/Min(60/21), CCE Max/Min(40/20)

Course Outcomes:
On completion of this course, the student will be able to:
CO1: describe various approaches to Artificial Intelligence.
CO2: design intelligent agents.
CO3: describe and apply concepts, methods, and theories of search, heuristics, games, knowledge representation, planning.
CO4: acquire basics knowledge of Natural language processing.
CO5: understand the limitations of Artificial Intelligence techniques.

UNIT-I

General Issues and Overview of AI : The AI problems, what is an AI technique, Characteristics of AI applications. Introduction to LISP programming: Syntax and numeric functions, Basic list manipulation functions, predicates and conditionals, input output and local variables, iteration and recursion, property lists and arrays.

UNIT-II

Problem Solving, Search and Control Strategies : General problem solving, production systems, control strategies forward and backward chaining, exhaustive searches - depth first, breadth first search. Heuristic Search Techniques : Hill climbing, branch and bound technique, best first search & A* algorithm, AND / OR graphs, problem reduction & AO* algorithm, constraint satisfaction problems.

UNIT-III

Knowledge Representations : First order predicate calculus, skolemization, resolution principle & unification, interface mechanisms, horn's clauses, semantic networks, frame systems and value inheritance, scripts, conceptual dependency.

UNIT-IV

Natural Language processing : Parsing techniques, context free grammer, recursive transitions nets (RNT), augmented transition nets (ATN), case and logic grammers, symantic analysis. Game playing : Minimax search procedure, alpha-beta cutoffs, additional refinements. Planning : Overview an example domain the block word, component of planning systems, goal stack planning, non linear planning.

UNIT-V

Probabilistic Reasoning and Uncertainty : Probability theory, bayes theorem and Bayesian networks, certainty factor. Expert Systems : Introduction to expert system and application of expert systems, various expert system shells, knowledge acquisition, case studies, MYCIN. Learning ; Rote learning, learning by induction, explanation based learning.

Books Recommended :

1. Elaine Rich and Kevin Knight “Artifical Intelligence” - Tata McGraw Hill.
2. “Artifical Intelligence” 4 ed. Pearson.
3. Dan W. Patterson “Introduction to Artifical Intelligence and Expert Systems”, Prentice India.
4. Nils J. Nilson “Principles of Artifical Intelligence”, Narosa Publishing House.
5. Clocksin & C.S.Melish “Programming in PROLOG”, Narosa Publishing House.
6. M.Sasikumar,S.Ramani etc. “Rule based Expert System”, Narosa Publishing House.

MCA II Sem-Paper Code-206042 : Cloud Computing

Credit 4; Theory Max/Min(60/21), CCE Max/Min(40/20)

Course Outcomes:

On completion of this course, the student will be able to:

CO1 : understand the architecture and infrastructure of cloud.
CO2 : learn the resource virtualization technique.
CO3 : build the appropriate file system and database.
CO4 : understand cloud security and challenges.
CO5 : evaluate third party cloud services for a real world problem.

Unit-I

Introduction: Historical development, Vision of Cloud Computing, Characteristics of cloud computing as per NIST, Cloud computing reference model, Cloud computing environments, Cloud services requirements, Cloud and dynamic infrastructure, Cloud Adoption and rudiments. Overview of cloud applications : ECG Analysis in the cloud, Protein structure prediction, Gene Expression Data Analysis, Satellite Image Processing, CRM and ERP, Social networking.

Unit-II

Cloud Computing Architecture: Cloud Reference Model, Types of Clouds, Cloud Interoperability & Standards, Scalability and Fault Tolerance; Cloud Solutions: Cloud Ecosystem, Cloud Business Process Management, Cloud Service Management. Cloud Offerings: Cloud Analytics, Testing Under Control, Virtual Desktop Infrastructure.

Unit –III

Cloud Management & Virtualization Technology: Resiliency, Provisioning, Asset management, Concepts of Map reduce, Cloud Governance, High Availability and Disaster Recovery. Virtualization: Fundamental concepts of compute, storage, networking, desktop and application virtualization. Virtualization benefits, server virtualization, Block and file level storage virtualization, Hypervisor management software, Infrastructure Requirements, Virtual LAN(VLAN) and Virtual SAN(VSAN) and their benefits.

Unit-IV

Cloud Security: Cloud Information security fundamentals, Cloud security services, Design principles, Secure Cloud Software Requirements, Policy Implementation, Cloud Computing Security Challenges, Virtualization security Management, Cloud Computing Security Architecture.

Unit-V

Market Based Management of Clouds, Federated Clouds/Inter Cloud: Characterization & Definition, Cloud Federation Stack, Third Party Cloud Services. Case study : Google App Engine, Microsoft Azure, Hadoop, Amazon, Aneka

Books Recommended :

1. Buyya, Selvi ," Mastering Cloud Computing ",TMH Pub
2. Kumar Saurabh, "Cloud Computing" , Wiley Pub
3. Krutz , Vines, "Cloud Security " , Wiley Pub
4. Velte, "Cloud Computing- A Practical Approach", TMH Pub
5. Sosinsky, " Cloud Computing" , Wiley Pub

MCA II Sem-Paper Code-20605 : JAVA Programming & Technologies

Credit 4; Theory Max/Min(60/21), CCE Max/Min(40/20)

Course Outcomes:

On completion of this course, the student will be able to:

CO1 : understand the object-oriented concepts – Classes, Objects, Inheritance, Polymorphism– for problem solving.

CO2 : design, implement, document, test, and debug a Java application consisting of multiple classes.

CO3 : handle program exceptions.

CO4 : handle input/output through files.

CO5 : create Java applications with graphical user interface (GUI).

UNIT-I

The Java Environment: History of Java: Comparison of Java and C++; Java as an object oriented language, Basic idea of application and applet; Basics: Data types; Operators- precedence and associativity; Type conversion; Java control statements; arrays; memory allocation and garbage collection in java. Object Oriented Programming in Java: Class & Object; Packages; scope and lifetime; Access specifies; Constructors; Copy constructor; this pointer; finalize () method; arrays; Memory allocation and garbage collection in java, keywords Inheritance : Inheritance basics, method overriding, dynamics method dispatch, abstract classes.

UNIT-II

Interfaces : defining an interface, implementing & applying interfaces, extending interfaces. Multithreading and Exception Handling: Basic idea of multithreaded programming; The lifecycle of a thread; Creating thread with the thread class and runnable interface; Thread synchronization; Thread scheduling; Producer-consumer relationship; Daemon thread, Selfish threads; Basic idea of exception handling; The try, catch and throw; throws Constructor and finalizers in exception handling; Exception Handling.

UNIT-III

Applets: the class hierarchy for applets; Life cycle of applet; HTML Tags for applet. The AWT: The class hierarchy of window fundamentals; The basic user interface components Label, Button, Check Box, Radio Button, Choice menu, Text area, Scroll list, Scroll bar; Frame; Layout managers; The Java Event Handling Model, ignoring the event, Self contained events, Delegating events; The event class hierarchy; The relationship between interface, methods called, parameters and event source; Adapter classes; Event classes.

UNIT-IV

Input/Output : Exploring Java I/O., stream classes The Byte stream : Input stream, output stream, file input stream, file output stream, print stream, Random access file, the character streams, Buffered reader, buffered writer, print writer, serialization. JDBC: JDBC ODBC bridge; The connectivity model; The driver manager; Navigating the resultset object contents; java.sql Package; The JDBC exception classes; Connecting to Remote database.

UNIT-V

Networking & RMI: Java Networking : Networking Basics : Socket, Client server, reserved sockets, proxy servers, Inet address, TCP sockets, UDP sockets. ; RMI for distributed computing; RMI registry services; Steps of creating RMI Application and an example. Collections: The collections framework, collection interfaces, collection classes.

Books Recommended :

1. Naughton & Schildt “The Complete Reference Java 2”, Tata McGraw Hill
2. Deitel “Java- How to Program:” Pearson Education, Asia
3. Horstmann & Cornell “Core Java 2” (Vol I & II) , Sun Microsystems
4. lvan Bayross “Java 2.0” : BPB publications
5. Ivor Horton’s “Beginning Java 2, JDK 5 Ed., Wiley India

MCA III Sem-Paper Code-30601 : COMPILER DESIGN

Credit 4; Theory Max/Min(60/21), CCE Max/Min(40/20)

Course Outcomes:
On completion of this course, the student will be able to:
CO1: describe how different phases of a compiler work.
CO2: understand formal languages and automata.
CO3: implement top down and bottom up parsing algorithms.
CO4: use compiler tools like lex for implementing syntax directed translator.
CO5: learn implementation of block structure languages.

Unit I

Compilers & Interpreters: aspects of compilation, structure of compiler, compilation of expression compilation of control structures, interpreters. Software tool. Linker & Loaders: Relocation & linking concepts, design of linkers, self relocating programs, linking for overlays, loaders : A two pass loader scheme.

Unit II

Formal Language and Automata: Definition & description, Chomskey classification of languages, regular grammar, finite automata, equivalence of FA and regular expression. Minimizing the number of states of a DFA, FSM with output (mealy and moore models). Lexical Analysis: Role of lexical analyzer, specification and recognition of tokens, automatic generation of lexical analyzer, Implementation of lexical analyzer using lex.

Unit III

Context free grammar, derivation of parse tree, capabilities of CFGs, normal form for CFG, Pushdown automata, relation of PDA with CFG, capabilities of CFG, Parser, Shift reduce parsing, operator precedence parsing top down parsing, Predictive parsing, LR parser, the canonical collection of LR(0) items, constructing SLR parsing table, constructing canonical LR parsing table, constructing LALR parsing table

Unit IV

Syntax direct translation schemes, implementation of syntax directed translators, intermediate code, postfix notation, parse tree and syntax tree, three address code, quadruples and triples, translations of assignment statement, Boolean expression, statements that alter the flow of control, cost fix translations, translation with top down parser.

Unit V

Symbol table, the contents of symbol tables, data structure for symbol tables, representing scope information, run time storage administration, implementation of a simple stack allocation schemes, implementation of block structure languages, storage for block structured languages.

Books Recommended :

1. Principal of compiler design by Afred V. Aho, Jeffrey D. Ulman.
2. "Compiler: principals Technique and tools", Aho, Ravi Sethi, Ulman, Pearson Education, VIII Ed 2002
3. Mishra & Chander Shekhar "Theory of Computer Science (Automate, Language & Computations)", PHI.
4. Hopcroft & Ullman "Introduction to Automata theory, languages & Computation", Narosha Publishing house.
5. Lewish Papadimutrau "Theory of Computation" , Prentice Hall of India, New Delhi.

MCA III Sem-Paper Code-30602 : Computer Networking & Internet

Credit 4; Theory Max/Min(60/21), CCE Max/Min(40/20)

Course Outcomes:

On completion of this course, the student will be able to:

CO1 : learn the basics of Computer network Technologies.

CO2 : understand the fundamentals of types of transmission mediums and interfacing standards along with the current edge of the data communication techniques.

CO3 : learn flow control and error control techniques and Computer Network protocols at Conceptual level.

CO4 : learn WAN and TCP/IP.

CO5: learn the architecture & protocols of email and www.

UNIT-I

Introduction : Computer Network, Layered Network Architecture-Review of ISO-OSI Model, Transmission Fundamentals, Communication Media : guided & unguided, Modulation & Demodulation, Digital to Analog Conversion-Frequency Modulation (FM), Amplitude, Modulation (AM), Phase Modulation (PM), Contention Protocol-, Stop-Go-Access Protocol, Aloha Protocol- Pure aloha & Slotted aloha, Carrier sense multiple access with collision detection (CSMA/CD)

UNIT-II

Data Security and Integrity: Parity Checking Code, Cyclic redundancy checks (CRC), Hamming Code, Protocol Concepts, Basic flow control, Sliding window protocol - Go-Back-N protocol and selective repeat protocol, Protocol correctness- Finite state machine

UNIT-III

Local Area Network: Ethernet : 802.3 IEEE standard, Token Ring : 802.5 IEEE standard, Token Bus : 802.4 IEEE standard, FDDI Protocol, DQDB Protocol, Inter Networking, Layer 1 connections-Repeater, Hubs, Layer 2 connections- Bridges, Switches, Layer 3 connections-Routers, Gateways.

UNIT-IV

Wide Area Network: Introduction, Network routing, Routing Tables, Types of routing, Dijkstra's Algorithm, Bellman-Ford Algorithm, Link state routing, Open shortest path first, Flooding, Broadcasting, Multicasting, Congestion & Dead Lock, Internet Protocols, Internet Layer-Class full Addressing – Class less addressing – Private Addresses – Subnets – Subnet masks Overview of TCP/IP, Transport protocols, Elements of Transport Protocol, Transmission control protocol (TCP), User data-gram protocol (UDP).

UNIT-V

Network Security, introduction to cryptography, Virtual Terminal Protocol, Overview of DNS, SNMP, email - Architecture and services, MIME, SMTP, Mail Gateways, Remote login, File Transfer Protocol, World Wide Web: Introduction, Architectural overview, static and dynamic web pages, HTTP, LDAP, Browser Architecture.

Books Recommended :

1. A.S.Tanenbaum, "Computer Network", 4th addition,PHI
2. Forouzan "Data Communication and Networking 3ed", TMH
3. J.F.Hayes, "Moduling and Analysis of Computer Communication Networks", Plenum Press
4. D.E.Comer, "Internetworking with TCP/IP", Volume Ist & IInd, PHI
5. Willium Stalling, "Data & Computer communications",Maxwell Macmillan International Ed.
6. D.Bertsekas and R.Gallager,"Data Networks", 2nd Ed. ,PHI.
7. G.E. Keiser ,"Local Area Networks ", McGraw Hill, International Ed.

MCA III Sem-Paper Code-306031 : Cryptography & Network Security

Credit 4; Theory Max/Min(60/21), CCE Max/Min(40/20)

Course Outcomes:

On completion of this course, the student will be able to:

CO1: learn classical encryption techniques and block cipher modes of operation.

CO2: implement a symmetric and asymmetric cryptographic methods

CO3 : learn Message authentication and Hash functions.

CO4: describe the role and implementation of digital signatures.

CO5 : understand IP security, Web security and system security.

UNIT-I

Classical Encryption Techniques: Symantec Cipher model, substitution Techniques, transposition techniques, rotor machines, steganography. Block Ciphers and the Data Encryption standards: Simplified DES, block cipher principles, the data encryption standard, the strength of DES, block cipher design principles, block cipher modes of operation, Triple DES.

UNIT-II

Confidentiality using symmetric encryption: Placement of Encryption function, traffic confidentiality, key distribution; Public key Encryption, Public key cryptography and RSA: Principles of Public key cryptosystems, the RSA algorithm; Key Management other public key cryptosystems : Key management, Diffie-Hallman key exchange algorithm.

UNIT-III

Message authentication and Hash function : Authentication Requirements, Authentication functions, message authentication codes, hash functions, security of hash function and MACs. Hash Algorithms: MD5 message digest algorithm, secure Hash algorithm; Digital Signature and Authentication protocols: Digital signatures, Authentication protocols, and digital signature standard. Authentication Applications: Kerberos, X.509 Authentication service.

UNIT-IV

Electronic Mail Security: Pretty Good privacy, S/MIME; IP Security : IP Security overview, IP security architecture, authentication header, encapsulating security payload, combining security associations, key management; Web Security: Web security considerations, Secure sockets layer and transport layer security, Secure Electronic Transaction(SET).

UNIT-V

System security: Intruders, intrusion detection, and password Management. Malicious software: Viruses and related threats, virus countermeasures. Firewalls: Firewall Design Principles, Trusted systems.

Books Recommended :

1. William Stallings “Cryptography and Network Security”, 3 ed, Pearson Education.
2. W.Stallings “ Network security Essential “ Applications & Standards”, Pearson ed.
3. Kanfren “Network Security : Private Communications in a public world 2/e
4. Eric Maiwald “ Network Security : A Preginner’s Guide, second ed.”, Tata Mcgraw Hill.
5. Roberta Bragg “ Mark Rhodes, Ousley & Keith Strassberg Network Security : The Complete

MCA III Sem-Paper Code-306032 : Mobile Computing

Credit 4; Theory Max/Min(60/21), CCE Max/Min(40/20)

Course Outcomes:

On completion of this course, the student will be able to:

CO1 : learn multiple access technology for Wireless Communication .

CO2 : understand the concept of mobile data communication.

CO3 : learn Digital Cellular Systems and Standards.

CO4 : describe Components and working of Wireless LAN**.**

CO5 : understand Bluetooth technology & WLL architecture.

UNIT-I

Overview of OSI Model: Significance of layered Model, PDUs, SDUs, IDUs, Higher layer Protocols, Switching and Components : Introduction, Applications, history of wired & wireless Communication systems; Radio Transmission : frequencies, signal propagation, antenna, types of modulation, FHSS, DSSS; Multiple Access technology for Wireless Communication : FDMA,TDMA, CDMA Cellular System : Introduction, types.

UNIT-II

Mobile Data Communication : Cellular Telephony; Structure, Fading, Small scale fading, Multi-path Fading, Speech Coding, Error Coding and Correction, Hand off Management, Switching and authentication, MTSO interconnections, frequency hopping, frequency reuse; Circuit Switched Data Services & Packet Switched Data Services on Cellular Networks, Personal Communication Systems (PCS) Architecture, Digital Enhanced Cordless Telecommunications (DECT), Personal Access Communications System (PACS).

UNIT-III

Digital Cellular Systems and Standards : GSM System overview, Architecture; GSM Practical Model, GSM Mobility Management, SMS security aspects, Broadcast System overview, General Packet Service (GRPS) Architecture, GRPS Network, Interfaces and Procedures (2.5 G), 3G Mobile Services : UMTS and International Mobile Telecommunications (IMT-2000), W-C DM and CDMA 2000, Quality of service in 3G .

UNIT-IV

WLAN : Components and working of Wireless LAN, Transmission Media for WLAN, Infrastructure & types of WLAN, IEEE 802.11 Standards, Protocols for WLAN, Multiple Access with Collision Avoidance (MACA), MACAW, Infrared technology. Wireless Application Protocol (WAP) model, architecture - Gateway, WAP protocols and WML.

UNIT-V

Introduction to. Bluetooth technology. Wireless in Local Loop (WLL) architecture, products. Satellite as a switch, Components of VSAT system, VSAT topologies access schemes.

Books Recommended :

1. Jochen Schiller "Mobile Communication", Pearson Education
2. Yi -Bing Lin and Imrich Chlamtac "Wireless and Mobile Network Architectures", Wiley India. .
3. Raj Pandaya "Mobile and Personal Communication System & Services". '

MCA III Sem-Paper Code-306033 : Software Quality Assurance

Credit 4; Theory Max/Min(60/21), CCE Max/Min(40/20)

Course Outcomes:

On completion of this course, the student will be able to:

CO1 : understand quality management processes.

CO2 : understand the importance of standards in the quality management process and role of SQA function in an organization.

CO3 : gain knowledge of software quality assurance.

CO4: understand the need and purpose of software testing.

CO5: learn the five views of software quality.

Unit-I

Introduction : Software Quality, Role of testing, v & v, objectives and issues of testing, Testing activities and levels, Sources of Information for Test Case Selection, White-Box and Black-Box Testing, Test Planning and Design, Monitoring and Measuring Test Execution, Test Tools and Automation, Test Team Organization and Management; Unit Testing: Concept, Static Unit Testing, Defect Prevention, Dynamic Unit Testing, Mutation Testing, Debugging.

Unit-II

Control Flow & Data Flow Testing: Outline of CFT, CF Graph, Paths in a Control Flow Graph, Path Selection Criteria, Generating Test Input, Examples of Test Data Selection; Overview of Dynamic Data Flow Testing, Data Flow Graph, Data Flow Testing Criteria, Comparison of Testing Techniques.

Unit-III

System Integration Testing & Test Design: Concept of Integration Testing, Different Types of Interfaces and Interface Errors, Granularity of System Integration Testing, System Integration Techniques, Test Plan for System Integration, Off-the-Shelf Component Testing, System Test Categories.

Unit-IV

System Test Planning, Automation & Execution: Structure of a System Test Plan, Test Approach, Test Suite Structure, Test Environment, Test Execution Strategy, Test Effort Estimation, Scheduling and Test Milestones, System Test Automation, Selection of Test Automation Tools, Test Selection Guidelines for Automation, Structure of an Automated Test Case, Test Automation Infrastructure Metrics for Tracking System Test, Metrics for Monitoring Test Execution, Beta Testing, System Test Report, Measuring Test Effectiveness, Acceptance Testing.

Unit-V

Software Quality: Five Views of Software Quality, McCall's Quality Factors and Criteria, Quality Factors Quality Criteria, Relationship between Quality Factors and Criteria, Quality Metrics, ISO 9126 Quality Characteristics, ISO 9000:2000 Software Quality Standard ISO 9000:2000 Fundamentals, ISO 9001:2000 Requirements.

Books Recommended :

1. N.S. Godbole, Software Quality Assurance: Principles and Practice for the New Paradigm (2nd Ed.), Narosa Publishing, 2017.
2. S.H. Kan, Metrics and Models in Software Quality Engineering (2nd ed.), Pearson Education Inc., 2003.
3. Stephen H.Khan ,Metrics and Models in Software Quality Engineering Pearson Education, India
4. Shari Lawrence Pfleeger,"Software Engineering Theory and Practice Pearson Education, India.

MCA III Sem-Paper Code-306034 : Internet Of Things

Credit 4; Theory Max/Min(60/21), CCE Max/Min(40/20)

Course Objectives:

On completion of this course, the student will be able to:

CO1 : Understand the IOT Terminology and Technology.

CO2 : Describe IOT applications.

CO3 : Analyze Protocol standardization for IOT.

CO4 : Perform an analysis of IOT security issues.

CO5: Identify the role of cloud computing in IOT.

Unit-I

Introduction – Digital Electronics, Logical gates and its working, Types of sensors: Temperature sensor (LM35,RTD,Thermocouple), Light sensor(photodiode, optocoupler), Distance and range sensor (IR,LVDT), Accelerometer sensor, Touch screen sensor.

Unit-II

Introduction to IOT - Definition & Characteristics, Importance of IoT, Physical Design of IOT, Logical Design of IOT, IOT Enabling technologies, IoT and M2M, IOT Platform Design Methodology, Purpose & Requirements Specification, Process Specification, Domain Model Specification, Information model Specification, Service specification, IOT level Specifications, Functional View Specifications, Operational View Specification, device and component integration, application development

Unit-III

Iot Smart X Application - Smart Cities, Smart Energy & Smart Grid, Smart Mobility & transport, Smart Home, Smart Building & Infrastructure, Smart Factory & Manufacturing, Smart Health, Smart Logistics & Retails. **Embedded suite for IoT Physical device –** Arduino / Raspberry Pi Interfaces, Hardware requirement of Arduino / Pi, Connecting remotely to the Arduino /Raspberry Pi, GPIO Basics

Unit-IV

Protocols in IOT: RFID: Introduction, Principle of RFID, Components of an RFID system, RFID Protocols & NFC protocols, CoAP, XMPP, AMQP, MQTT

Resource Management In The Internet Of Things: Clustering, Software Agents, Clustering Principles in an Internet of Things Architecture, Design Guidelines, Software Agents for Object Representation, Data Synchronization.

Unit-V

Internet of things Challenges: Vulnerabilities of IoT, Security, Privacy & Trust for IoT, Security requirements Threat analysis, Use cases and misuse cases, Introduction to cloud computing, Role of Cloud Computing in IoT, Cloud-to-Device Connectivity, Cloud data management, cloud data monitoring, Cloud data Exchange.

Books Recommended :

1.Pethuru Raj, Anupama C. Raman, The Internet of Things Enabling Technologies, Platforms, and Use Cases, CRC Press Taylor & Francis Group, International Standard Book Number-13: 978-1-4987-6128-4

2. Internet of Things: A Hands-on Approach", by Arshdeep Bahga and Vijay Madisetti (Universities Press)

3. Rajkumar Buyya, Amir Vahid Dastjerdi Internet of Things – Principals and Paradigms, Morgan Kaufmann is an imprint of Elsevier, ISBN: 978-0-12-805395-9 Hakima Chaouchi, " The Internet of Things Connecting Objects to the Web" ISBN : 978-1- 84821-140-7, Willy Publications

4. Olivier Hersent, David Boswarthick, Omar Elloumi, The Internet of Things: Key Applications and Protocols, ISBN: 978-1-119-99435-0, 2 nd Edition, Willy Publications

5. Daniel Kellmereit, Daniel Obodovski, "The Silent Intelligence: The Internet of Things",. Publisher: Lightning Source Inc; 1 edition (15 April 2014). ISBN-10: 0989973700, ISBN-13: 978- 0989973700.

MCA III Sem-Paper Code-306041 : DOT NET Technology

Credit 4; Theory Max/Min(60/21), CCE Max/Min(40/20)

Course Objectives:

On completion of this course, the student will be able to:

CO1 : learn .NET Technology.

CO2 : understand the Visual Basic fundamentals.

CO3 : describe the classes, interfaces & arrays.

CO4 : learn creation of window forms & controls.

CO5 : understand file handling and graphics in VB.

UNIT-I

Introduction to .NET Technology, Introduction to VB.NET, Building VB.net Application, IDE Dot.NET, Evolution of Dot.net Framework, Keywords, Statement, Variables, Enumerable, Constant, Data Types, Conversion, Operators, Comments, Decision Making, Looping, Array, Handling Strings, Strings Function.

UNIT-II

Handling Dates and Times, Sub Procedure and Function, Creating Function, Passing Values as arguments, Creating Properties, Handling Exception, Resume Next, Resume Line, ON Error GOTO, Structure Exception Handling Exception Filtering. Throwing Exception, Custom Exception.

UNIT-III

Classes and Objects : Types, Field, Properties, Methods and Events, Class vs Object, Members Overloading, Overriding, Creating Class, Object, Structure & Modules, Accessing Modifiers, Shadowing, Creating Interfaces, Polymorphism, Early and Late binding, Multiple Interface, Using MyBase and MyClass Keyword, Inheritance based Polymorphism and Interface Based Polymorphism.

UNIT-IV

Window Forms: Creating Window Forms, Controls to Form, Setting Title bars, Dialog Boxes, Handling Mouse Events, Handling Key Press Events, Controls Classes: Textbox, Rich Textbox, Labels, Link Labels, Buttons, Checkbox, Panels, Group Boxes, Radio Button, Drop Down, List Boxes, Combo Box, Scroll Bars, Pickers, Tool Tips, Timers, Menu, Min & Max Button, Image, Toolbars, Popup Menu, Setup Dialog, Progress bar, Status Bar, Tab Controls.

UNIT-V

File Handling: File Opening and Creating, Writing Files, Reading Binary Data, Directory class, Files Class, Graphics : Using Brush class, Using Pen Class, Graphics Class, Data Access and ADO.NET: Creating Data set, Populating Dataset, Displaying data in Grids, Data access using Data Adapters Controls, Binding Data to Controls, Using Data Views.

Books Recommended :

1. Jeffrey R. Shapiro “The Complete Reference Visual Basic .NET” Tata Mcgraw Hill.
2. Rox “Beginner and Professional Edition VB.NET” Tata Mcgraw Hill.
3. Steven Holzner “Visual Basic .NET Black Book” Wiley Dreamtech Publication.
4. Alex Homer, Dave Sussman “Professional ASP.NET1.1” Wiley Dreamtech
5. Bill Evzen,Bill Hollis “Professional VB.NET 2003” Wiley Dreamtech
3. Tony Gaddis “Starting Out VB.NET PROG.2nd Edition” Wiley Dreamtech
6. Chris Ullman, Kauffman “Beg. ASP.NET1.1 with VB.NET 2003” Wiley Dreamtech
7. Chris Ullman, Kauffman “Beg ASP.NET1.1 with VC#.NET 2003” Wiley Dreamtech

MCA III Sem-Paper Code-306042 : Python Programming

Credit 4; Theory Max/Min(60/21), CCE Max/Min(40/20)

Course Objectives:

On completion of this course, the student will be able to:

CO1 : understand different data types used in python.

CO2 : get better understanding of different types of control structures.

CO3 : use different data structures for different problem domains.

CO4 : apply different object oriented features for solving real world problems.

CO5 : develop different web based applications.

UNIT -I

Installing Python, Simple program using Python, Expressions and Values, Variables and Computer Memory, error detection, Multiple line statements, Designing and using functions, functions provided by Python, Tracing function calls in memory model, omitting return statement. Working with Text: Creating Strings of Characters, Using Special Characters in Strings, Creating a Multiline String, Printing Information, Getting Information from the Keyboard.

UNIT-II

A Boolean Type , Choosing Statements to Execute, Nested If Statements, Remembering the Results of a Boolean Expression Evaluation, A Modular Approach to Program Organization, Importing Modules, Defining Your Own Modules, Testing Code Semi automatically Grouping Functions Using Methods: Modules, Classes, and Methods, Calling Methods the Object-Oriented Way, Exploring String Methods, Underscores.

UNIT-III

Storing Collections of Data Using Lists: Storing and Accessing Data in Lists, modifying Lists, Operations on Lists, Slicing Lists, Aliasing, List Methods, Working with a List of Lists. Repeating Code Using Loops: Processing Items in a List, Processing Characters in Strings, Looping Over a Range of Numbers, Processing Lists Using Indices, Nesting Loops in Loops, Looping Until a Condition Is Reached, Repetition Based on User Input, Controlling Loops : Using Break and Continue Reading and Writing.

UNIT-IV

Files: Kinds of files, Opening a File, Techniques for Reading Files, Files over the Internet, Writing Files and Writing Algorithms That Use the File-Reading Techniques, Multiline Records. Storing Data Using Other Collection Types: Storing Data Using Sets, Storing Data Using Tuples, Storing Data Using Dictionaries, Inverting a Dictionary, Using the In Operator on Tuples, Sets, and Dictionaries, Comparing Collections.

UNIT-V

Collection of New Information Object-Oriented Programming : Understanding a Problem Domain, Function “Isinstance”, Class Object, and Class Book, Writing a Method in Class Book, Plugging into Python Syntax: More Special Methods, Creating Graphical User interface: Building a Basic GUI, Models, Views, and Controllers, Customizing the Visual Style Introducing few more Widgets, Object-Oriented GUIs, Keeping the Concepts from Being a GUI Mess.

Books Recommended :

1. O’Relly, Python Crash Course, 2nd Edition: A Hands-On, Project-Based Introduction to Programming
2. John Zelle, Python Programming: An Introduction to Computer Science
3. Mark Lutz, Python Pocket Reference: Python in Your Pocket
4. O’Relly, Head First Python: A Brain-Friendly Guide, by Paul Barry

MCA III Sem-Paper Code-306043 : Data Warehousing and Mining

Credit 4; Theory Max/Min(60/21), CCE Max/Min(40/20)

Course Objectives:

On completion of this course, the student will be able to:

CO1 : learn the data mining functionalities.

CO2 : understand and exhibit the basics of data warehousing and multi-dimensional modeling.

CO3 : describe data preprocessing.

CO4 : understand classification , clustering, frequent pattern analysis and regression .

CO5 : learn cluster analysis and DM tools.

UNIT – I

Motivation, importance, Data type for Data Mining : relational Databases, Data Warehouses, Transactional databases, advanced database system and its applications, Data mining Functionalities: Concept/Class description, Association Analysis classification & Prediction, Cluster Analysis, Outlier Analysis, Evolution Analysis, Classification of Data Mining Systems, Major Issues in Data Mining.

UNIT – II

Data Warehouse and OLAP Technology for Data Mining : Differences between Operational Database Systems and Data Warehouses, a multidimensional Data Model, Data Warehouse Architecture, Data Warehouse Implementation, Data Cube Technology.

UNIT- III

Data Preprocessing: Data Cleaning, Data Integration and Transformation, Data Reduction, Discretization and Concept Hierarchy Generation. Data Mining Primitives, Languages, and System Architectures, Concept Description: Characterization and Comparison, Analytical Characterization.

UNIT – IV

Mining Association Rules in Large Databases: Association Rule Mining: Market Basket Analysis, Basic Concepts, Mining Single-Dimensional Boolean Association Rules from Transactional Databases : the Apriori algorithm, Generating Association rules from Frequent items, Improving the efficiency of Apriori, Mining Multilevel Association Rules, Multidimensional Association Rules, Constraint-Based Association Mining.

UNIT – V

Classification & Prediction and Cluster Analysis: Issues regarding classification & prediction, Different Classification Methods, Prediction, Cluster Analysis, Major Clustering Methods, Applications & Trends in Data Mining: Data Mining Applications, currently available tools.

Books Recommended :

1. J. Han and M. Kamber, “Data Mining: Concepts and Techniques”, Morgan Kaufmann Pub.
2. Berson “Dataware housing, Data Mining & DLAP, @004, TMH.
3. W.H. Inmon “ Building the Datawarehouse, 3ed, Wiley India.
4. Anahory, “Data Warehousing in Real World”, Pearson Education.
5. Adriaans, “Data Mining”, Pearson Education.
6. S.K. Pujari, “Data Mining Techniques”, University Press, Hyderabad.

MCA III Sem-Paper Code-306044 : Bigdata Analytics & Visualization

Credit 4; Theory Max/Min(60/21), CCE Max/Min(40/20)

Course Objectives:

On completion of this course, the student will be able to:

CO1 : learn Big data and its characteristics.

CO2 : understand best practices for Big data Analytics and Integration tools.

CO3 : describe data modeling.

CO4 : learn elementary data analysis.

CO5 : understand basics of visualization.

UNIT-I

Introduction of big data, Big data characteristics - Volume, Veracity, Velocity, and Variety – Data, Appliance Challenges and Issues, Case for Big data, Big data sources, Features of data, Evolution of Big data, Best Practices for Big data Analytics and Integration tools.

UNIT-II

Introduction to Data Modeling, Data Models Used in Practice: Conceptual data models, Logical data models, Physical data models, Common Data Modeling Notations, How to Model Data : Identify entity types, Identify attributes, Apply naming conventions, Identify relationships, Apply data model patterns, Assign keys, Normalize to reduce data redundancy.

UNIT-III

Introduction to elementary data analysis: Measures of center: Mean, Median, Mode, Variance, Standard deviation, Range. Normal Distribution: Center, Spread, Skewed Left, Skewed Right, outlier. Correlations: Correlation Patterns: Direction relationship, Magnitude Relationship.

UNIT-IV

Introduction to Bayesian Modeling: Bayes Rule, Probabilistic Modeling Introduction to Predictive Analytics: Simple Linear regression, Multiple Linear regression, Logistic Linear Regression.

UNIT-V

Visualization: History of Visualization, Goals of Visualization, Scientific Visualization, Information Visualization, Visual Analytics, Impact of visualization Introduction to Data Processing, Map Reduce Framework, Hadoop, HDFS, S3, Hadoop Distributed file systems, Apache Mahout, Hive, Sharding, Hbase, Impala, Case studies : Analyzing big data with twitter, Big data for Ecommerce, Big data for blogs.

Books Recommended :

1. Frank J Ohlhorst, “Big Data Analytics: Turning Big Data into Big Money”, Wiley andSAS Businessm.Series, 2012.

2. The Data Modeling Handbook: A Best-Practice Approach to Building Quality DataModels 1st Edition by Michael C. Reingruber (Author), William W. Gregory(Author) A Wiley QED publications

3. Colleen Mccue, “Data Mining and Predictive Analysis: Intelligence Gathering andCrime Analysis”,Elsevier, 2007

4. Correlation and Regression: Applications for Industrial Organizational Psychologyand Management (Organizational Research Methods) 1st Edition, by Philip BobkoMultiple Regression and Beyond 1st Edition by Timothy Z. Keith.

MCA III Sem-Paper Code-30605 : Web Applications Development

Credit 4; Theory Max/Min(60/21), CCE Max/Min(40/20)

Course Objectives:

On completion of this course, the student will be able to:

CO1 : understand web architecture.

CO2 : learn HTML & CSS.

CO3 : apply different modern technologies used for real-time client server application.

CO4 : develop different attractive and interactive web pages.

CO5 : learn basics of android application deployment environment.

UNIT- I

Introduction to Web Designing: Web architecture, Parsing in Browsers, Web site design standards, Client Side Technologies: Introduction to Markup languages HTML 5, Building a form and form elements, Dynamic HTML - JavaScript - Cascading Style Sheets - Including Multimedia. HTTP, Web Server and Application Servers, Installation of application servers, Config files, Web.xml.

UNIT - II

Java Servlet: Servlet Development Process, Deployment Descriptors, The Generic Servlet, Lifecycle of Servlet. Servlet Packages, Classes, Interfaces, and Methods, Handling Forms with Servlet. Various methods of Session Handling. Various elements of deployment descriptors.

UNIT - III

JSP Basics: JSP lifecycle, Directives, scripting elements, standard actions, implicit objects. Connection of JSP and Servlet with different database viz. Oracle, MS-SQL Server, MySQL. java.sql Package. Querying a database, adding records, deleting records, modifying records. Type of Statement.

UNIT - IV

Separating Business Logic and Presentation Logic, Building and using JavaBean. Session handling in JSP, Types of errors and exceptions handling. Introduction to Web Services, MVC Architecture, Struts and Hibernate.

UNIT - V

Introduction to Android: Fundamentals, Application Structure, Basic UI design, Android Application Deployment Environment, Dalvik virtual machine, Testing and Debugging Android Application.

Books Recommended :

1. K. Mukhar, “Beginning Java EE 5: From Novice to Professional”, Wrox Press.
2. M. Hall, L. Brown, “Core Servlets and Java Server Pages”, 2nd edition, Pearson Education
3. Deitel and Deitel, “*Internet and WWW — How to Program?*” Fifth Edition, Prentice Hall, 2012.
4 G. Franciscus, “Struts Recipes”, Manning Press
5. B. Basham, K. Sierra, B. Bates, “Head First Servlet and JSP”, 2nd Edition, O'Reilly Media.
6. Android application development for java programmers. By James C. Sheusi. Publisher: Cengage Learning, 2013.

AWADHESH PRATAP SINGH UNIVERSITY
REWA (M.P.)

BACHELOR OF COMPUTER APPLICATION
(BCA I, II, III)
(I - VI Sem.)

2008-2009

BACHELOR OF COMPUTER APPLICATION (BCA)

CURRICULUM AT A GLANCE

The course structure, break-up of marks and duration of examination in paper and practical shall be as per the scheme approved by the Board of Studies of Computer Science.

BCA (First Semester)

PAPER CODE	NOMENCLATURE OF PAPER	MAX	MIN
FC –I-1	Foundation Course –I	50	50
FC –I-2	Foundation Course –II	50	
FC –I-3	Foundation Course –III	50	
BCA –1	Fundamentals of Computers	50	17
BCA-2	Introduction to Operating System	50	17
BCA-3	Introduction to PC Software	50	17
BCA-4	Basic Mathematics –I	50	17
BCA-5 (PR)	Operating System	50	17
BCA-6 (PR)	PC Software	50	17
BCA-7	Minor Project (Internal Evaluation)	50	17

BCA (Second Semester)

PAPER CODE	NOMENCLATURE OF PAPER	MAX	MIN
FC –II-1	Foundation Course –I	50	50
FC –II-2	Foundation Course –II	50	
FC –II-3	Foundation Course –III	50	
BCA-8	Programming in C	50	17
BCA-9	Digital Electronics	50	17
BCA-10	Analysis & Design of Information System	50	17
BCA-11	Computer Oriented Accounting	50	17
BCA-12 (PR)	Digital Electronics & Accounting Software	50	17
BCA-13 (PR)	Programming in C	50	17
BCA-14	Minor Project (External Evaluation)	50	17

BCA (Third Semester)

PAPER CODE	NOMENCLATURE OF PAPER	MAX	MIN
FC –III-1	Foundation Course –I	50	
FC –III-2	Foundation Course –II	50	50
FC –III-3	Foundation Course –III	50	
BCA –15	OOPs Using C++	50	
BCA-16	Data Structure	50	17
BCA-17	Basic Mathematics –II	50	17
BCA-18	System Software	50	17
BCA-19 (PR)	C++ & Data Structure	50	17
BCA-20 (PR)	DBMS [illegible]	50	17
BCA-21	Minor Project (Internal Evaluation)	50	17

BCA (Fourth Semester)

PAPER CODE	NOMENCLATURE OF PAPER	MAX	MIN
FC –IV-1	Foundation Course –I	50	
FC –IV-2	Foundation Course –II	50	50
FC –IV-3	Foundation Course –III	50	
BCA-22	Web Technologies	50	17
BCA-23	Database Management System	50	17
BCA-24	Visual Programming Language	50	17
BCA-25	Computer Network	50	17
BCA-26 (PR)	Web Technologies & DBMS	50	17
BCA-27 (PR)	Visual Programming Language	50	17
BCA-28	Minor Project (External Evaluation)	50	17

K. K. Tatara Shrivastava

BCA (Fifth Semester)

PAPER CODE	NOMENCLATURE OF PAPER	MAX	MIN
FC –V-1 FC –V-2 FC –V-3	Foundation Course –I Foundation Course –II Foundation Course –III	50 50 50	50
BCA-29	Computer Graphics	50	17
BCA-30	Discrete Mathematics	50	17
BCA-31	Programming in JAVA	50	17
BCA-32	Operating System	50	17
BCA-33 (PR)	Java	50	17
BCA-34 (PR)	Graphics	50	17
BCA-35	Minor Project (Internal Evaluation)	50	17

BCA (Sixth Year)

PAPER CODE	NOMENCLATURE OF PAPER	MAX	MIN
FC –VI-1 FC –VI-2 FC –VI-3	Foundation Course –I Foundation Course –II Foundation Course –III	50 50 50	50
BCA –36	Software Engineering	50	17
BCA –37	RDBMS	50	17
BCA-38	Real Life Project (Internal & External Evaluation)	Int 100 Ext. 100 =200	66
BCA-39(PR)	RDBMS	50	17

(PR) = Practical Paper

BCA-I SEM

Max Marks 50 (17)

Subject FC-I-1- आधार पाठ्यक्रम

Paper Title - पेपर – हिन्दी भाषा संरचना – 1

इकाई – 1

1. भारत वंदना : (काव्य) सूर्यकांत त्रिपाठी 'निराला'
2. स्वतंत्रता पुकारती : (काव्य) जयशकर प्रसाद
3. भाषा की महत्ता और उसके विविध रूप

इकाई – 2

1. करूणा (निबंध) आचार्य रामचन्द्र शुक्ल
2. बिच्छी बुआ (कहानी) डॉ.लक्ष्मणसिह विष्ट 'बटरोही'
3. हिन्दी की शब्द संपदा (पर्याय, अनेकार्थी, शब्दयुग्म, विलोम)

इकाई – 3

1. विलायत पहुँच ही गया (आत्मकथांश) महात्मा गाँधी
2. तीर्थ यात्रा–डॉ. मिथिलेण कुमारी मिश्र
3. वाक्य संरचना और विराम चिन्ह

इकाई – 4

1. दीक्षांत भाषण (वक्तृत्व कला) स्वामी श्रद्धानंद
2. पत्र मैसूर के महाराजा को (पत्रलेखन) स्वामी विवेकानंद
3. पत्र लेखन, महत्व और उसके विविध रूप

इकाई – 5

1. योग की शक्ति पत्रलेखन (डायरी) : डॉ हरिवंणराय बच्चन
2. यात्रा संस्मरण : डॉ. दवेन्द्र सत्यार्थी
3. सार लेखन, भाव पल्लवन

BCA-I SEM

Max Marks 50 (17)

Subject FC-I-2-- Foundation Course

Paper Title - Paper II English Language and Indian Culture

Unit I

Texts :

1. Nirendranath Chakrabarti, .Amalkanti.. (From *Oxford Anthology of Modern Indian Poetry*, eds. Dharwadkar and Ramanujan.)
2. Toru Dutt, Sita
3. Jawaharlal Nehru, Tryst with Destiny
4. Mirza Ghalib, Delhi in 1857..
5. C. Rajagopalachari, Preface to *The Mahabharata*.
6. Nibir K. Ghosh, .Spiritual Nationalism of Sri Aurobindo.
7. Madhumalati Adhikari, .The Heritage of Indian Culture.

Unit II

Comprehension of an unseen passage:
Questions should be objective/multiple-choice, and should test (a) an understanding of the passage in question, and (b) a grasp of general language skills and issues with reference words and usage within the passage.

Unit III

Paragraph Writing :
Word limit : 100-150 words. Candidates to attempt any one of three alternative topics provided.

Unit IV

Basic language skills . Vocabulary: synonyms, antonyms, one-word substitution for phrases, prefixes, suffixes and word-derivation. Questions should not repeat the examples or exercises given in the textbook

Unit V

Basic language skills . Grammar and Usage :
Modals linking devices, tenses, and prepositions.
Questions should not repeat the examples or exercises given in the textbooks.

BCA-I SEM

Subject FC-I-3-- Foundation Course
Paper Title - Paper III : **Development of Entrepreneurship**

Unit I

Entrepreneurship- Definition, Characteristics and importance, Types and functions of an entrepreneur, merits of a good entrepreneur motivational factors of entrepreneurship.

Unit II

(a) Motivation to achieve targets and establishment of ideas. Setting targets and facing challenges. Resolving problems and creativity.
Sequenced planning and guiding capacity, Development of self confidence.
(b) Communication skills, Capacity to influence, leadership.

Unit III

(a) Project Report-
Evaluation of selected process.
Detailed project report . Preparation of main part of project report pointing out necessary and viability.
(b) Selecting the form of Organisation . Meaning and characteristics of sole Proprietorship, Partnership and cooperative committees, elements affecting selection of a form of an organisation.
(c) Economic management .
Role of banks and financial institutions banking, financial plans, working capital-evaluation and management, keeping of accounts.

Unit IV

(a) Production management . Methods of purchase.
Management of movable assets/goods. Quality management.
Employee management. Packing.
(b) Marketing management.
Sales and the art of selling. Understanding the market and market policy.
Consumer management. Time management.

Unit V

(a) Role of regulatory institutions . district industry centre, pollution control board, food and drug administration, special study of electricity development and municipal corporation.
(b) Role of development organizations, khadi & village Commission/ Board, MP Finance Corporation, scheduled banks, MP Women.s Economics Development Corporation.
(c) Self-employment-oriented schemes, Prime Minister.s Employment schemes, Golden Jubilee Urban environment scheme, Rani Durgavati Self-Employment scheme, Pt. Deendayal Self-employment scheme.
(d) Various grant schemes . Cost-of-Capital grant, interest grant, exemption from entry tax, project report, reimbursement grant, etc.
(e) Special incentives for women entrepreneurs, prospects & possibilities.
(f) Schemes of M.P. Tribal Finance Development Corporation, schemes of M.P. Antyavasai Corporation, schemes of M.P. Backward Class and Minorities Finance Development Corporation.

BCA-I SEM

BCA-1 : FUNDAMENTALS OF COMPUTERS

Max Marks 50 (17)

Unit-I

History, Generation of Computers. Characteristics, Capabilities and Limitations. Classification of Computers and types of Digital computers. Hardware, Software, types of software. Generations of Computer Languages. High and low level languages, Types of Translators (Compiler, Interpreter and Assembler)

Unit-II

Working of a computer using block diagram, Components of Computer system, Central Processing Unit, Address, Control and Data Bus. Arithmetic Logic Unit, Control Unit, storage units ; Bits and Bytes, Booting of PC system. Comparative study of various series of IBM PC Family.

Unit-III

Introduction and working of various input/output devices: Keyboard, mouse, MICR, OCR, OMR, Bar Code, Audio Response Unit, Scanner, VDU, Plotter, Impact and Non-impact printers, Computer Output Microfilm (COM).

Unit-IV

Primary memory: RAM, ROM, EPROM, EEPROM. Cache memory. Secondary memory: Floppy disc, hard disk, magnetic tape, CD-ROM, DVD Overview of tracks, sectors, cylinders, access time, seek time, latency time.

Unit-V

Basics of data communication. Communication media, Methods of data transmission, modes of data transmission, Analog versus digital and serial versus parallel communication. Introduction to computer Network: Advantages, type, various LAN topologies, Distinction between LAN, WAN, MAN, Overview of Internet. www, email, ftp, telnet, chat, browser, newsgroup.

Books Recommended:

1. Sinha, P.K.: Computer Fundamentals, BPB Publ.
2. Jain, Satish: Introduction to Computer Science, BPB Publ.

K. K. Latare Shivalaxmi

BCA-I SEM

BCA-2 : INTRODUCTION TO OS

Max Marks 50 (17)

Unit-I

Introduction to O.S.: Historical evolution, Need, Type, Batch processing, multiprogramming, time sharing, Online, Real time, multitasking, multiprocessing, Spooling, Functions of O.S Layered organization, Comparative study of popular operating systems.

Unit-II

MS-DOS: Internal commands (dir, copy, del, cd, rd, md, rename, prompt, ver, vol, type, path, time, date etc.). External commands (tree, undelete, chkdsk, fdisk, backup, restore, format, unformat, attrib, xcopy, diskcopy, diskcomp etc.)

Unit-III

File redirection, filtering and piping, Concept of Batch files, config file, autoexec file Booting process in MS-DOS. File system and concepts of files and directories in MS-DOS. Use of function keys in MS-DOS.

Unit-IV

Structure of Unix system: Kernel, Shell, Utility programs, Unix file system, concept of files and directories. General commands: bc, echo, cat, kill, date, wc, sleep, who, ps etc. File oriented commands: cat, cp, grep, pg, mv, rm, del, etc. File permissions: chmod, chown etc. Directory oriented commands: ls, mkdir, cd, rmdir, pwd etc. Inter user communication commands: write, mail etc.

Unit-V

Windows. Introduction, GUI, windows desktop, start button, taskbar, switching between programs and windows. Managing files, folders and objects. Windows explorer, Creating shortcuts. Control panel. Windows accessories: Paintbrush, wordpad, calculator, etc. Sharing information among applications using OLE and clipboard. Comparison of Unix, MS-Windows and MS-DOS.

Books Recommended:

1. Cowart, R. : Mastering windows, BPB.
2. Koparkar, P.K Unix for you, TMH.
3. Thomas, R.: Dos 6 and 6.2 instant reference, BPB.

BCA-I

BCA-3 : INTRODUCTION TO PC SOFTWARE

Max Marks 50 (17)

UNIT–I

Introduction to Microsoft Office : The Office Manager, Sharing Information with Microsoft Office, The Clipboard, Object Linking and Embedding (OLE), Editing Linked Information, Editing Embedded Objects, Word Processing with Word for Windows: Word Basics: Undo, Redo, Repeat, Inserting Text, Replacing Text, Formatting Text, Cut, Copying from one Word Document to Another, Print, Autoformat

UNIT–II

MS WORD : Working with Headers, Footers, Endnotes, Footnotes, tabs, tables, sorting, Working with graphics: Importing graphics, Sizing and Cropping graphics with the picture command, Drawing objects, Text in Drawings (Word Art), Pictures using Drawing objects, Rotating and Flipping Objects, Callouts, Filling: Templates, Wizards: Spelling Checker, Autocorrect, Autotext, Grammar Checker, Word Count and Other Statistics, Creating Tables of Contents and Index, Macros, Introduction to Mail Merge.

UNIT–III

MS EXCEL: Overview of Excel Features, Rearranging worksheets Excel page setup, changing column widths and row heights, autoformat, manual formatting, using different styles, hiding rows and columns, working with multiple worksheets, An Introduction to excel functions, Excels chart features: Instant charts with the chart Wizard, creating charts on separate Worksheets, Resizing and Moving charts, adding chart notes and arrows, editing charts, Working with graphics in excel, creating and placing graphic objects, resizing graphics, Introduction to Excel's command Macros, using worksheets as databases.

UNIT–IV

MS POWERPOINT: Creating presentations, Auto content wizard, editing slides, Working with Text in Power Point, Formatting and Aligning Text; Working with graphics in Power Point; Importing images from the outside and drawing in power point, creating organizational charts, inserting cliparts & picture/photos in Power Point Presentation, Excel charts in power point, inserting table from word, Arranging, Previewing and rehearsing, transition and building effects, printing presentation elements, creating overhead transparencies

UNIT–V

MS ACCESS : Creation of databases, tables, forms, reports & queries, use of macros & modules, creation of relationships among tables, generating simple queries using databases, Administering & securing a database, Writing expressions for queries.

Books Recommended :

1. Mansfield R.' The Compact guide to MS-OFFICE, BPB
2. Mansfield R.. Word 6 for Windows Quick & Easy Reference, TECH.
3. Murray : Mastering POWER POINT 6.0 for Windows, BPB
4. Cowart : ABC's of MS – ACCESS, BPB.

R.K. Kataria Shiva Rao

BCA-I SEM

BCA-4 : BASIC MATHEMATICS-I

Max Marks 50 (17)

Unit-I

Limits, function and continuity: Concept of real function, its domain and range. Fundamental theorems on limits, continuity of a function at a point, over an open and closed interval, properties of continuous function.

Unit-II

Differential calculus: Basic concept of the derivative of a function, differential coefficient of the product of two function, algebra of derivation of function. Differential coefficient of the quotient of two functions, differential coefficient of a function of a function.

Integration: Standard integrals, method of integration, integration by substitution method, integration by parts.

Unit-III

Determinants: Definition, minors and cofactors, properties. Matrices: Definition, types, equality, multiplication of matrices, transpose of matrix, adjoint of a matrix, inverse of a matrix, application of matrices in solving the simultaneous equation.

Unit-IV

Co-ordinate Geometry –I : Rectangular Cartesian coordinates of a point in space, distance between two points, cylindrical co-ordinates; spherical co-ordinates, direction cosines, points of division, orthegonal projection, angle between straight lines.

Unit-V

Co-ordinate Geometry-II: Sphere circle & related topics, Tangent lines and tangent planes to a sphere, redial plane, redial line, co axial spheres. Limiting points examples and exercises.

Books recommended:

1. N. Saran	:	Real analysis, S. Chand and Co.
2. Parmanand Gupta	:	Comprehensive mathematics, Laxmi Publ. Ltd.
3. R.K. Mohanti	:	Differential Calculus, Anmol Pub.
4. Gorakh Prasad	:	Text book on differential calculus, Pothishala Pvt.
5. Gorakh Prasad	:	Text book on Integral calculus, Pothishala Pvt.

R. K. Katare

BCA-II SEM

Max Marks 50 (17)

Subject FC-II-1-- Foundation Course
Paper Title - पेपर हिन्दी भाषा संरचना – 2

इकाई – 1

1. जाग तुझको दूर जाना : (काव्य) सुश्री महादेवी वर्मा
2. हम अनिकेतन : (काव्य) श्री बालकृष्ण शर्मा 'नवीन'
3. भाषा कौशल : (लिखना, पढना, बोलना समझना)

इकाई – 2

1. समन्वय की प्रक्रिया (निबंध) श्री रामधारी सिंह 'दिनकर'
2. अनुवाद : परिभाषा, प्रकार, महत्व, विशेषता
3. परिभाषिक शब्दावली

हिन्दी से अंग्रेजी–20 षब्द
अंग्रेजी से हिन्दी –20 षब्द

इकाई – 3

1. अफसर (व्यंग्य) श्री शरद जोशी
2. मकड़ी का जाला (व्यंग्य) : डॉ. रामप्रकाश सक्सेना
3. शब्द रचना : तत्सम, तद्भव, देशज, विदेशी

इकाई – 4

1. भारत का सामाजिक व्यक्तित्व (प्रस्तावना) पं. जवाहरलाल नेहरू
2. बनी रहेंगी किताबें – डॉ. सुनीता रानी घोष
3 सड़क पर दौड़ते ईहा मृग : डॉ. श्यामसुन्दर दुबे

इकाई – 5

1. कोश के अखाड़े में कोई पहलवान नहीं उतरता : (साक्षात्कार) भाषाविद् डॉ हरदेव बाहरी से प्रो. त्रिभुवन नाथ शुक्ल
2. यदि 'बॉ' न होती तो गाँधी को यह ऊँचाई न मिलती : कथाकार गिरिराज किशोर से डॉ. सत्येन्द्र शर्मा
3. साक्षात्कार : प्रयोजन और कौशल

R.K. Lalare

BCA-II SEM

Max Marks 50 (17)

Subject FC-II-2-- Foundation Course
Paper Title - Paper II English Language and Indian Culture

Unit I

Texts :
1. Rabindranath Tagore,. Where the Mind is Without Fear..
2. Kabir, one Song translated by Tagore.
3. M.K. Gandhi, extract from .Satyagraha..
4. R.K. Narayan, . Toasted English..
5. Ruskin Bond, . The Old Lama..
6. Khushwant Singh, . The Portrait of a Lady..
7. Ashok Mahadevan and Sushan Shetty, .Discovering Babasaheb.. Section on .Clash of Titans. (*Reader.s Digest*, December 2006)

Unit II

Comprehension of an unseen passage:
Short-answer type questions should test (a) an understanding of the passage
In question, and (b) a grasp of general language skills and issues with reference words and usage within the passage.

Unit III

Paragraph writing: based on expansion of an idea.
Word limit : 100-150 words. Candidates to attempt any one of three alternative ideas given.

Unit IV

Basic language skills : Vocabulary : making sentences with idioms and phrases, corrections of sentences with words likely to be confused.
Questions should not repeat the examples or exercises given in the text book.

Unit V

Basic language skills :Grammar and usage : Verb forms and structures, gerunds, participles and infinitives, verbs followed by a preposition and phrasal verbs, articles and determiners, countable and uncountable nouns, adjectives, and adverbs.
Questions should not repeat the examples or exercises given in the textbook.

BCA-II SEM

Max Marks 50 (17)

Subject FC-II-3– Foundation Course
Paper Title - Paper III : **Development of Entrepreneurship**

Unit I

Entrepreneurship- Meaning, Concept, Characteristics of entrepreneur.

Unit II

Types of entrepreneurship, importance and views of various thinkers (Scholars) .
- Formation of goals, How to achieve goals.
- Problems in achieving targets and solution.
- Self motivation, elements of self motivation and development.
- Views of various scholars, evaluation, solutions.

Leadership capacity : Its development and results.

Unit III

Projects and various organisations (Govt., non-Govt.), Govt. Projects, Non-Govt. projects.
Contribution of Books, their limitations, scope.

Unit IV

Functions, qualities, management of a good entrepreneur.
Qualities of the entrepreneur (Modern and traditional).
Management skills of the entrepreneur.
Motive factors of the entrepreneur.

Unit V

Problems and Scope of the Entrepreneur :
- Problem of Capital
- Problem of Power
- Problem of registration
- Administrative problems
- Problems of Ownership.

BCA-II SEM

BCA-8 : PROGRAMMING IN C

Max Marks 50 (17)

UNIT–I

C language programming: Flowchart, Algorithm, Introduction to C language, Character set of C-language. The structure of a simple C program: Simple I/O functions (scanf, printf, gets, puts, getchar, getche, getch); Use of semicolon, braces, parentheses, comments and newline character; Data types in C. Assignment statement, Arithmetic, Relational & Logical operators: Unary operator, sizeof operator, Conditional operators, Precedence of operators.

UNIT–II

Control structure: The if-else statements, nesting of if-else, switch statement, Loops: while and do-while loop, the for loop, Functions. User defined functions, Returning a value from a function, Local and Global variables, Parameters, Type declaration of a function, Functions with more than one parameters, Prototype of a function. Functions with arguments, functions without arguments. Storage classes

UNIT–III

Arrays: Declaration and initialization; the break and continue statement; String and Character arrays, operations with arrays; searching in array (linear and binary). Sorting an array (Bubble, Selection and Insertion), String & String functions: sprintf, strcpy, scanf, strcat, strlen, malloc, strcmp. Two dimensional array, matrix, types of matrix – addition and product of two matrices.

UNIT–IV

Pointers: The concept of pointers, passing pointers as parameters, arrays of pointers, Pointer to pointers, Array of pointers to strings, Sorting an array, using pointers, Structures: The concept of structure, Initializing, Arrays of structures, Arrays within structures, Structures within Structures, passing structures to function, unions

UNIT–V

Files: Files in 'C', Modes for files: Functions used in files (getc, putc, fopen, fclose, fscanf, fread, fwrite, fprintf, fseek, ftell, rewind), text versus binary files, The C preprocessor, Preliminaries of C preprocessor Directives, (#define, #undef, #include, #ifdef, #ifndef, #endif, #else, #if).

Books Recommended:

1. Gottfried, Programming with C, TMH
2. E. Balagurusamy, Programming in ANSI C, TMH
3. Rajaraman, Introduction to C, PHI
4. Cooper, Mullish, The Spirit of C, An introduction to modern programming, Jaico Pub. House, N. Delhi.
5. Y. Kanetkar, Understanding Pointer in C, BPB
6. Y. Kanetkar, Let us C, BPB
7. Y. Kanetkar, Exploring in C, BPB

K.K. Katare Shivakar

BCA-II SEM

BCA-9 : DIGITAL ELECTRONICS

Max Marks 50 (17)

Unit-I

Number system and codes, decimal, binary, octal, hexadecimal and their inter conversion. Binary addition, subtraction, multiplication and division ASCII, gray code, excess-3 code, BCD numbers.

Unit-II

Gates: NOT, OR, AND, NAND, NOR, XOR, XNOR. Boolean algebra, DeMorgan's theorem, Application of gates, Half adder and full adder.

Unit-III

TTL circuits: Digital IC 74 series, TTL characteristics, Totempole and open collector gates, Comparison between different types of TTL, Multiplexer, Demultiplexer, Encoder, Decoders.

Unit-IV

Boolean functions and truth tables, SOP, POS, min-terms and max-terms, Karnaugh map, method of reduction

Unit-V

Flip-flop, registers and counter. RS flip-flop. Clocked D Flip-flip. Edge triggered D Flip-flip. Edge triggered JK Flip-flip. Racing in Flip-flop. JK Master-Slave Flip-flip. Buffer registers, Shift registers, Ripple counters, Synchronous counters, Ring counters, Presetable counters, Mod counters.

Books recommended:

1. Digital Computer Electronics: Malvino.
2. Computer Fundamentals : B. Ram.

K. K. Katare

BCA-II SEM

BCA-10 : ANALYSIS AND DESIGN OF INFORMATION SYSTEM

Max Marks 50 (17)

UNIT-I

Organizational Foundation of IS: Historical Evolution of Information system, The competitive Business Environment, Advantages of Using Computerized Information System (IS), Six major types of Information System, The changing matter of Information Technology, Challenges of Information systems, Relationship between Organisation and Information systems, Salient Features of Organization and management, Classical Model, Behavioral Model and Decision Model, Levels and types of Decision Making, System Approach Theory, Management Challenges, Ethical and Social Impact of Information System.

UNIT –II

Technical Foundation of Information System: Charting Techniques, Structured Analysis and Design, Decision Tree, Decision Table, DFD, Data Dictionary, Information System Software Tools and Approaches: Advantages and disadvantages of using IS Software Tools, Idea of Object Oriented Programming, CASE tool, PERT & CPM, Recent Database Management Trends, Distributed Databases: Object Oriented and Hypermedia Databases, Telecommunications, The Internet.

UNIT –III

Building Information System: Traditional System Development Life Cycle (SDLC), Analysis: Problem Identification, Fact Gathering, Fact Analysis, Feasibility Study, Feasibility Report, Design: Physical and Logical Design, File Design, I/O Design, Database Design, Limitation of traditional life cycle approach, Prototyping, Outsourcing information system, A Typical Case Study of Information System.

UNIT –IV

Implementation: Managing and Controlling of Information System, Testing, training, conversion, Post Implementation phase, Ensuring quality with IS, Traditional tool & methodology for quality assurance, New approaches to quality assurance, Measuring Information System Success, Areas of Problem in Information System, Causes of Information system Success and Failure, Controlling Risk Factor, Auditing Information System.

UNIT–V

Management and Organizational Support Systems: Knowledge Work System, Decision Support System (DSS), Group Decision Support System (GDSS), Executive Support System (ESS), Artificial Intelligence (AI), Expert System, Neural Network, Growth of International Information System, Main Technological Issues: Merger of International Technology and Infiastructure.

Books Recommended:

1. Lauden C. Kennieth & Lauden P. Jane: Management Information System: Organization Technique, PHI.
2. Awad E. M.: Systems Analysis and Design, Galgotia Pub.
3. Murdic, Ross, Clagett : Information Systems for Modern Management, PHI
4. Bhatnagar S. C. : Computer & Information Management, PHI

BCA-II SEM

BCA-11 : COMPUTER ORIENTED ACCOUNTING ~~FINANCIAL MANAGEMENT~~

Max Marks 50 (17)

UNIT–I

Accounting: Basic concept, conventions and principles, Double entry system. Introduction to basic books of accounts, Journal, Ledger, Closing of books of accounts. Trial balance; Final Accounts, Trading, profit and loss accounts and balance sheet.

UNIT–II

Introduction to Financial Management: Meaning and scope; Ratio analysis: Meaning, advantages, Limitations.

UNIT–III

Fund flow statement: Meaning, Importance, Preparation and Interpretation, Cash flow statement: Meaning, Importance, Preparation and Interpretation.

UNIT–IV

Introduction to Costing: Nature, Importance Principles and Types. Budget and budgetary control: Nature, Importance, Type (Master budget and flexible budget) and Preparation

UNIT–V

Introduction to Computerized accounting System: Master files, transaction files, introduction to documents used for data collection, processing of different files and outputs obtained. General idea of accounting packages.

Books Recommended:

1. Shukla & Grewal, Advance Accounts, S. Chand & Co.
2. Sharma & Gupta, Financial Management, Kalyani
3. Sharma & Gupta, Management Accounting, Kalyani.

BCA-III SEM

Max Marks 50 (17)

Subject FC-III-1-- Foundation Course
Paper Title - पेपर I हिन्दी भाषा और विज्ञान–बोध

इकाई – 1

1. जवानी : (काव्य) श्री माखनलाल चतुर्वेदी
2. शिकागो (व्याख्यान) – स्वामी विवेकानंद
3. हिन्दी भाषा की रूप संरचना

इकाई – 2

1. आचरण की सभ्यता : सरदार पूर्ण सिंह
2. राज और समाज – डॉ. विजय बहादुर सिंह
3. हिन्दी भाषा का मानकीकरण

इकाई – 3

1 शिरीष के फूल – आचार्य हजारी प्रसाद द्विवेदी
2. मांडव – श्री रामनारायण उपाध्याय
3. समास–संरचना और प्रकार

इकाई – 4

1. महाजनी सभ्यता : प्रेमचन्द
2. साहित्यकार का दायित्व : डॉ. प्रेम भारती
3. संधि, परिभाषा एवं भेद

इकाई – 6

1. उसने कहा था – श्री चन्द्रधर गुलेरी
2. फिल्टर तो चाहिए ही – डॉ. देवेन्द्र दीपक
3. संक्षिप्तियाँ

BCA-III SEM

Max Marks 50 (17)

Subject FC-III-2-- Foundation Course
Paper Title - Paper II English Language and Scientific Temper

Unit I

Texts :
1. Tina Morris, .Tree..
2. Nissim Ezekiel, .Night of the Scorpion..
3. Bertrand Russell, . Can man be rational?.
4. C.P. Snow, . Ramanujan..
5. Roger Rosenblatt, . The power of WE., pages 116-118, *Reader.s Digest*.April 2007.
6. George Orwell, . What is science?.
7. Anil Rajan, . Me and my .Pod.., first section (pages 200-201). *Reader.sDigest*. May 2007.

Unit II

Comprehension of an unseen passage :
Questions should test (a) an understanding of the passage in question, (b) the themes and issues raised in the passage, and (c) a grasp of general language skills and issues with reference to words and usage written the passage To be answered by both objective/multiple. Choice and short answer questions.

Unit III

Letter writing : Formal letters.

Unit IV

Basic language skills: Grammar and usage :
Correction of common errors in sentence· structure· usage of pronouns. subject-verb agreement, word order, gender: compound, nouns. collective nouns. possessives Articles and Prepositions (advanced).

Unit V

Language Skills: Punctuation of passages, transformation of sentences (assertive, negative, affirmative, interrogative, exclamatory)

K. K. Datar

BCA-III SEM

Max Marks 50 (17)

Subject FC-III-3-- Foundation Course
Paper Title - Paper III : Environmental Studies

Unit I

Study of Environmental and ecology:
(a) Definition and Importance.
(b) Environmental Pollution and problems.
(c) Public participation and Public awareness.

Unit II

Environmental Pollution :
(a) Air, water, noise, heat and nuclear pollution.
(b) Causes, effect and prevention of pollution
(c) Disaster management . Flood. Earthquake, cyclones and landslides.

Unit III

Environment and social problems :
(a) Development . non-sustainable to Sustainable
(b) Energy problems of cities.
(c) Water preservation . rain-water collection.

Unit IV

Role of mankind in conserving natural resources :
(a) Food resources . World food problem.
(b) Energy resources . increasing demand for energy.
(c) Land resources . Land as resources.

Unit V

Environment conservation laws :
(a) Conservation laws for air and water pollution.
(b) Wildlife conservation laws.
(c) Role of information technology in protecting environment & health.

BCA-III SEM

BCA-15 : OOPs USING C++

Max Marks 50 (17)

Unit-I

Introduction to OOP :- Procedural, Structured and Object Oriented Programming(OOP) , Basic concepts of OOP : Object, Classes, Inheritence, Polymorphism, Reusability; Benefits & applications of OOP, C++ and OOP. Characters used in C++. Basic data types, user defined data types, Structure of C++ program, use of conditional and looping statements in C++. Arrays in C++, Reference variable, operators, structures, union, enum.

Unit-II

Functions : prototypes, default arguments, const arguments in functions, Inline functions, call by value, call by reference, function overloading. Classes and objects : Declaring a class, defining an object, data hiding and encapsulation, public and private data members & functions, friend function. Pointer to data member, pointer to member function and pointer to object, virtual function.

Unit-III

Constructors & Destructors: Parametrized constructors, multiple constructor in a class, copy constructors, arrays of object, object as function, arguments, returning objects, the this pointer, memory allocation for objects. Operator Overloading : Unary and binary operators, type conversions.

Unit-IV

Inheritence Inheritence and derivation, single, multilevel, multiple, hierarchical & hybrid inheritence, constructors in multiple inheritence, private and protected inheritance. Overriding functions, virtual methods, ambiguity resolution, virtual base class. Constructors in derived class. Member classes : nesting of classes.

Unit-V

Streams : C++ streams, stream classes, unformatted & formatted I/O operations, member functions of cin, manipulators, managing output with manipulators, user defined manipulators with arguments. Files : Classes for file stream operations, file I/O with streams, file modes, binary versus text files, binary I/O, random access, error handling during file operations, command line arguments, Exception handling.

Books Recommended:

1. E. Balagurusamy, Object Oriented Programming with C++ , TMH
2. Jesse Liberty, Teach Your self ANSI C++ , Technedia
3. Robert Lafore, Object Oriented Programming in Turbo C++ , Galgotia Publications
4. Stroustrup, The C++ Programming Language, Addison Wesley.
5. Herbert Schild, C++ Complete Reference, TMH
6. Yashwant Kanatkar, Let us C++, BPB

R.K. Latore Shrivastava

BCA-III SEM

BCA-16 : DATA STRUCTURE

Max Marks 50 (17)

UNIT - I

Primitive Data Structures, Operations on Data Structures; Integer, Real number, Character Information, Logical and Pointer Information, Algorithm analysis for time and space requirements. Non-primitive data structures, Storage structure for arrays, Operations on arrays, Stacks: Definition and operations on stacks, Applications of stacks; Recursion, Polish expressions and their manipulations.

UNIT–II

Queues: Operations on queues, Priority queues, Linked storage representation, Pointers and linked allocation, Linked linear lists, Operations on linked lists, Circular linked list, Doubly linked lists, Application of linked lists, Dynamic Storage Management: Garbage collection, Storage Compaction.

UNIT–III

Trees, Definitions and concepts of general trees and binary trees, Representation of binary trees, Binary tree representation of general tree, Binary tree traversal, Threaded binary trees, Operation on binary trees, Application of trees, Binary search trees

UNIT-IV

Introduction to Graphs, definition, terminology, directed, undirected and weighted graphs, Representation of graphs, Graph traversal: Breadth first search, Depth first search, Spanning trees, Minimal spanning tree, Application of graphs.

UNIT–V

Notation and concepts, Selection sort, Bubble sort, Merge sort, Heap sort, insertion sort, quick sort, Hash-table method, Hashing functions, Collision resolution techniques, Searching : Linear search, Binary search.

Books Recommended:

1. Horowitz & Sahni : Fundamentals of Data Structures, Comp. Sc. Press
2. S. Lipschutz : Schaum's Outline Series: Data Structures, Mc Graw Hill
1. Data Structures Using C; Tenenbaum, PHI
2. Data Structures Using Pascal, Tenenbaum, PHI
6. D. E. Knuth : The Art of Computer Programming, Addision Wesley
7. R. G. Dromey : How to solve it by computer

BCA-III SEM

BCA-17 : BASIC MATHEMATICS-II

Max Marks 50 (17)

Unit I

Vector Algebra: Concept of Vector, forms of vector, algebra of vector. Composition and resolution of vector, Scalar and vector product of two vectors.

Unit-II

Measures of central tendency: The arithmetic mean, weighted arithmetic mean, geometric mean, harmonic mean, root mean square, median, mode quartiles, deciles and percentiles.

Unit-III

Measures of dispersion: The range, mean deviation and standard deviation.

Unit-IV

Probability: Elementary probability theory, sample space, events, classical and relative frequency definition of probability, theorems of total and compound probability

Unit-V

Curve fitting and the method of least squares. Regression, coefficient of correlation.

Books recommended:

1. M. Ray and H.S. Sharma : Mathematical statistics, Ram Prasad and Sons.
2. Parmanand Gupta : Comprehensive mathematics, Laxmi Publ. Ltd.
3. Shanti Narayan : A text book of vector algebra, S. Chand & Co.
4. M. Ray : Vector Algebra, Ram Prasad and Sons.
5. N. Saran & S.N. Nigam : Introduction to vector analysis, Pothishala Pvt.

R. K. Katare

BCA-III SEM

BCA-18 : SYSTEM SOFTWARE

Max Marks 50 (17)

UNIT-I

Difference between system software and application software. Layered organization of system software. Introduction to System Software: The Simplified Instructional Computer (SIC): Machine structure (Memory, Register, Data formats, Instruction format, Addressing modes, Instruction set, Input/output),

UNIT-II

Assembler: Assemblers: Basic Assembler Functions (A Simple SIC assembler, tables and logic). Assembler for Small Computer, op-code and symbol table.

UNIT – III

Loaders And Linkers: Separate compilation and linking, loading linking and relocation, Basic Loader Functions, Machine dependent loader features (Relocation, Program linking, Tables and logic, a linking loader), Machine-independent loader features (Automatic library search, loader upturns, overlay program), Loader Design option (Linkage editors, Dynamic linking, Bootstrap loaders).

UNIT-IV

Software tools: A brief overview, interpreter and program generators, debug monitors, programming environments. Text editors: Overview of the editing process, User interface editor structure.

UNIT-V

Compilers: Main parts of a Compilers and their functions, lexical analyzer, parser, symbol table manager, code generator.

Books Recommended:

1. Leland L. Beck: System Software (An introduction to systems programming), Addison Wesley Publishing Company.
2. Alfred Jeffrey Ullman: Principles of Compiler Design, Narosa Publishing Home, New Delhi.
3. D.M. Dhamdhare: Systems Programming & Operating Systems, TMH

R.K. Tatare. Shrivastava

BCA-IV SEM

Max Marks 50 (17)

Subject FC-IV-1-- Foundation Course
Paper Title - हिन्दी भाषा और विज्ञान – बोध

इकाई – 1

1. विज्ञान – परिभाषा, शाखाएं, संक्षिप्त इतिहास
2. प्रमुख वैज्ञानिक आविष्कार और हमारा जीवन
3. भारतीय कृषि

इकाई – 2

1. भारतीय वनस्पतियाँ एवं जीव
2. जीवन – उद्भव और विकास
3. मुहावरे और लोकोक्तियाँ

इकाई – 3

1. सौर – मंडल
2. ब्रह्मांड और जीवन
3. पर्यावरण

इकाई – 4

1. व्यापार एवं उद्योग
2. जनजातीय जीवन
3. निबंध लेखन की कला

इकाई – 5

1. जल संरक्षण
2. मध्यप्रदेश के पर्यटन स्थल
3. सपनो की उड़ान : ए.पी.जे. अब्दुलकलाम

R. K. Katare

BCA-IV SEM

Max Marks 50 (17)

Subject FC-IV-2-- Foundation Course
Paper Title - Paper II English Language and Scientific Temper

Unit I

Texts :
1. C. Rajagopalchari, .Three Questions..
2. Desmond Morris, short extract from *The Naked Ape*.
3. Joseph K. Verner, . Eat What You Want., First three paragraphs (*Reader.s Digest*, August 2006)
4. Urbashi Barat, .The Story of Kanada..
5. .Against all Odds.. Adapted by Shubhra Tripathi from .The Natural Intelligence of Alexis Leon.. by Madhavankutty Pillai, *Reader s Digest*, November 2007.
6. Keki N. Daruwalla, .Boatride along the Ganga., Stanza 1.
7. Ashok Mahadeven, .For Heaven.s Sake. Extract from article on J.V. Narlikar. *Reader s Digest*, June 2007.

Unit II

Comprehension of an unseen passage :
Questions should test (a) an understanding of the passage in question, (b) the themes and issues raised in the passage, and (c) a grasp of general language skills and issues with reference to words and usage written the passage. To be answered by both objective/multiple-choice and short-answer questions.

Unit III

Report-Writing of events and incidents for newspapers and magazines.

Unit IV

Language skills : Reported speech, Voice, Expanding points into complete sentences, Reorganizing sentences to make a coherent passage.

Unit V

Language skills : Synthesis of sentences: Transformation of simple, Compound and complex sentences, Positive, comparative and Superlatives; Expressing condition; elision.

K. K. Tatale Shrivastava

BCA-IV SEM

Max Marks 50 (17)

Subject FC-IV-3-- Foundation Course
Paper Title - Paper III : Environmental Studies

Unit I : Problem of natural resources

(a) Problem of water resources . Utilization of surface and ground water, overutilisation, flood, drought, conflicts over water, dams-benefits and problem.
(b) Problems of forest resources . uses and overutilisation, deforestation, utilisation of timber, dams and its effect on forests and tribes.
(c) Problems of land resources Land as a source, erosion of land, maninduced, land slides and desertification.

Unit II : Bio-diversity and its protection .

(a) Value of bio-diversity Consumable use : Productive use, Social, alternative, moral aesthetic and values.
(b) India as a nation of bio-diversity and multi-diversity at global, national and local levels.
(c) Threats to bio-diversity . Loss of habitat, poaching of wildlife, manwildlife conflicts.

Unit III

Human Population and Environment
(a) Population growth, disparities between countries.
(b) Population explosion, family welfare Programme
(c) Environment and human health.

Unit IV

Multidisciplinary nature of environmental studies :
(a) Natural resources
(b) Social problems and the environment
(c) Ecosystem.

Unit V

Environmental Wealth :
(a) Rivers, ponds, fields and hills.
(b) Rural, Industrial, Agricultural fields.
(c) Study of common plants, insects and birds.

BCA-IV SEM

BCA-22 : WEB TECHNOLOGY

Max Marks 50 (17)

UNIT – I

Internet : History and evolution of Internet ,Internet & intranet ,Basic concept of www , HTTP, FTP, URL, domain name, IP address, web browser, web server, web page, web site, Portals, email, chatting, Usenet, telnet, newsgroup, Fax, Telephony, telecommuting, Conferencing, Searching , downloading , uploading, files on internet ,Search Engines. Email (reading, ending, deleting, replying), voice & video conferencing. Internet Protocol :TCP/IP, dialup access, direct access, three levels of Internet connectivity. ISPs, Introduction to DNS.

UNIT-II

Internet Security & HTML: Overview of internet security, access security, transaction security, security zones, digital IDS, sending / receiving signed & encrypted emails. Introduction to firewalls, web page design : static and dynamic web pages, introduction to HTML,HTML elements and tags, formatting with HTML tags, physical, logical HTML styles ,setting fonts ,colors and headings, displaying Plain , presenting and arranging text using <DIV>, <SPAN> , <LAYERS> tags.

UNIT-III

ADVANCE HTML: Working with images, links and lists, creating tables, working with frames, creating horizontal, vertical frames, named frames, opening new browser window, creating html forms, Adding controls on forms, submitting data from forms, working with multimedia, multimedia sound, video, 3D,Using multimedia files, inline sound and videos. Style sheets: types, creating and, using style sheets.

UNIT-IV

Java script & XML: introduction to client and server side scripting, introduction to Java script, data types, operators, conditional statement, loops in Java script, functions, arrays, objects and elements in Java script, form validation using Java script Introduction to XML, Creating XML documents, specifying attributes in DTDs, accessing XML data with XML Data Island, documents, Handling events while loading XML documents.

UNIT-V

E-Commerce: Introduction to E-Business, Electronic Fund Transfer (EFT), Value-chain, internet Business strategy, Functional Architecture, implementation Strategies; Building Blocks of E-commerce, System design, creating and managing content etc; Payment systems; Auxiliary system; transaction Processing; Building e-commerce system, system architecture, secure links etc; Present and future Trend; Impact of e-commerce; A case Study on development of e-commerce system.

Books Recommended:

3. Teach Your Self Internet In 24 Hours : Technedia.
4. Internet Complete . BPB Publication.
5. HTML Blake Book: Steven Holzer.
4. The Internet :Christian Crumlish (BPB Publication).
5. Html Complete : BPB Publication.

K.K. Latare Shivs Lal

BCA-IV SEM

BCA-23 : DATABASE MANAGEMENT SYSTEM

Max Marks 50 (17)

UNIT-I

Basic Concept: An Introduction to database System, Advantages and limitations of DBMS. Database System Architecture, Purpose of DBMS, Data Independency, Basic File Systems Types of file, operations on file, file activity ratio, access time, response time, volatility, file size. File Organization: Sequential, Index Sequential, Direct access. Detail design of E-R Model.

UNIT-II

Three Data Models: An Overview of three Main Data Models i.e. Hierarchical Model, Network Model, Relational Model and their Inter-comparison. Relational Algebra: Basic Operation like Union, Intersection, Difference, Product, Join. The Power of SQL (Creation, Insertion, Deletion, Indexing & Modification of Databases in SQL).

UNIT-III

Normalisation: Relational Database Design. Integrity Constraints. Functional Dependency: Single Value and Multi Value Functional dependence, Normal Forms: I, II, III, Boyce Codd, IV & V Normal forms. Security & Integrity: Introduction, Access Control, Crypto Systems.

UNIT-IV

Introduction to Database and foxpro package: Ideas of database hierarchy (bit, byte, field, record): Foxpro commands: create, use, list, display, edit, browse, append, insert, delete, zap, pack, copy, to print, quit, clear, go top, go bottom, modify structure, recall, replace, sort, index, locate, continue, seek, search, find, close, Arithmetic, date, time and string function with database using commands/functions such as count, aveage, sum, time, day, dow, cdow, year, date, ctod, dtoc, cmonth, month, val, trim, str), displaying information with ? and ??.

UNIT-V

Programming: Using Input, Output statements and Conditional statement ACCEPT, INPUT, IF-ELSE-ENDIF, DO CASE-ENDCASE, DO WHILE-ENDDO, TEXT-ENDTEXT, SKIP, WAIT, STORE, SET commands. Generation of Report, Label and Customized Screen, Use of multiple files: Master file updation, Setting relations.

Books recommended:

1. Henry F. Korth & A. Silbershatz: Data Base System Concepts, MGH
2. C. J. Date: Database Management System, MGH
3. R. K. Taxali: Foxpro 2.6, TMH.
4. Arun K. Majumdar & P. Bhattacharya: Data Base Management System, TMH
5. Jeffrey O. Ullman : Principles of Database Systems, Galgotia Pub. Co. Ltd.
6. Bipin C. Desai: An Introduction to Database Systems, Galgotia Pub. Co. Ltd.
7. James Martin: Principles of Database Management, PHI
8. James Martin. Computer Database organization, PHI

R.K. Kataria Shiva Kaur

BCA IV SEM

BCA-24 : VISUAL PROGRAMMING LANGUAGE

Max Marks 50 (17)

UNIT I

Introduction to VB: The Integrated Development environment (Menu bar, Tool box, Project Explorer, Properties window, object browser), working with forms, variables, procedure (Sub, Event, General) Control Structures (If.....Then.....Else), Select.. ..Case, Do While . . Loop, For.....Next) Exit for and Exit Do statement, With-End with statement, Arrays, Data types, User-Defined, Data Types, constants, Datatype conversion, Built-in Functions, operators.

UNIT II

Working with controls – Classification of controls, study of various controls, Text box, label, Command button, option button, list box, combobox & Scrollbar, Flex grid & Built-In Activex controls) with respect to property, event and methods. Creating Control Array (at Design-time, at runtime, menus, mouse events and dialog boxes, OLE.

UNIT III

OOPS inVB: Objects, working with objects, forms as object, constructors and destructors collections (collection object, control collection), Class module. Database Programming: ODBC, Database Access methods in VB (DAO, RDO, ADO). Recordset

UNIT IV

Advanced data controls (datalist, datacombo, datagrid, Hierarchical flexigrid). SQL and the T-SGL Debugger. Overview of Data Report and Crystal Report Activex Controls: Creating and Deploying Activex controls, Overview of COM/DCOM, Activex Exe and Activex DLL. VB Script: VB vs Vbscript, objects, operators, functions, statements in VB scripts.

UNIT V

Active Server Pages: Built in ASP objects Response object (write, buffer, clear, flush, End, redirect, Expires, Expire Absolute method). Request object: Form collection (Query string, form), HTTP headers, ready the HTTP headers request. Server variables method, Environment variable; Cookies: Reading and writing cookies, Tradeoffs of cookies, Session object: Session variable, application object: Application variable, Session vs Application object, Global as a file ASP components: Add Rotator, Content linker and browser capabilities, Server object: Reading and writing files on the web server. Asp error object.

Text Books

1 Teach yourself VB6 in 21 days - Techmedia
2 VB6 Unleashed - Techmedia
3 Teach yourself ASP in 21 days - Techmed
4 ASP unleased - Techmedia

BCA-IV SEM

BCA-25 : COMPUTER NETWORKS

Max Marks 50 (17)

UNIT I

Introduction to Computer Networks:
Basics of data communication, digital vs analog transmission, mode of transmission, Computer Networks: Goals and kinds (LAN/WAN), idea of hardware and software requirements for computer networks, intercomparison of various communication media, wireless transmission., various topologies: bus, ring, tree & mesh, OSI reference model vs TCP/IP.

UNIT II

Data Link Layer:
Reference models: OSI vs TCP/IP, Data Link Layer Design Issues: Framing Error Control and Flow Control, Error Detection & Correction, Elementary Data Link Protocols, Sliding Windows Protocols, HDLC frame packet.

UNIT III

Medium Access Sub Layer:
Medium Access Sublayer: Channel allocation problem, Multiple access protocols: ALOHA, CSMA, Collision tree: Standards in LAN/WAN (CCITT & IEEE), High speed LANs: FDDI, Fast Ethernet: Satellite Networks: Polling, FDM, TDM, CDMA.

UNIT IV

The Network and Transport Layer:
Network Layer design issues, routing and switching techniques, Routing Algorithms, congestion control algorithms, the network layer in the internet; transport layer: Elements of transport services, transport protocols, the internet transport protocol, TCP & UDP

UNIT V

Application Layers and Network Management:
Network Security: Traditional cryptography, cryptography principles, secret key algorithms, public key algorithm, Authentication protocol, Domain Name System, Simple Network Management Protocol, E-mail, News group, WWW, Future trends in computer networks.

Books recommended:

1. Tanenbaum: Computer Networks, PHI
2. John Freer: Computer Communication & Networks, EWP
3. William Stalling: Data & Computer Communication, PHI
4. Basandra & Jaiswal: Local Area Network, Galgotia
5. James Martin: Computer Nerworks & Distributed processing , PHI
6. Uyless Black: Computer Networks, PHI

BCA-V SEM

Max Marks 50 (17)

Subject FC-V-1– Foundation Course
Paper Title - भाषा कौशल एवं व्यक्तित्व विकास

इकाई – 1

भाषा कौशल एवं व्यक्तित्व :

1 . भारतीय संस्कृति का स्वरूप और विशेषताएँ
2. भारतीय समाज व्यवस्था : आश्रम व्यवस्था, वर्ण व्यवस्था
3. संस्कार

इकाई –2

1. उद्योग व्यापार
2. शिल्प कला
3. न्याय व्यवस्था

इकाई – 3

1. धर्म
2. दर्शन
3. नीति

इकाई – 4

ललित कलाएँ

1. साहित्य
2. संगीत
3. चित्र,मूर्ति,स्थापत्य कला

इकाई – 5

1. भारतीय संदर्भ में
2. अन्तरराष्ट्रीय संदर्भ में
3. समन्वयीकरण के सदर्भ में

R. K. Ketare Shrivastava

BCA-V SEM

Max Marks 50 (17)

Subject FC-V-2-- Foundation Course

Paper Title - Paper II English Language and Aspects of Development

Texts for Units I & II:

1. William Wordsworth, .Three years she grew..
2. Vikram Seth, . The Mouse and the Snake..
3. K. Aludiapillai, .Communication Education & Information technology..
4. Ashok Mahadevan, .Miracles by the Thousand. (pages 50-53). *Reader.s Digest*. January 2007.
5. Marcus Natten, . Childhood..
6. Shubhra Tripathi, .Globalization and Liberalization..
7. Mrinal Pande, .Girls . Abridged and adapted by Urbashi Barat.

Unit I

Short-answer questions. 5x2=10

Unit II

100-word questions. 2x5=10

Unit III

Short essay of about 250-300 words. Three alternative topics to be provided, candidates to attempt any one.

Unit IV

Official reports and proposals.

Unit V

Language skills : Correcting errors in elision, in synthesis and transformation, and in punctuation. Tense and Voice (advanced). Questions should not repeat the examples or exercises provided in the textbook.

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BCA-V SEM

Subject FC-V-3-- Foundation Course
Paper Title - Paper III Basic Computer Information Technology -I

Max. Marks: 25

Unit I

INTRODUCTION TO COMPUTER ORGANIZATION .I
History of development of Computer system concepts. Characteristics, Capability and limitations. Generation of computer. Types of PC s Desktop. Laptop. Notebook. Workstation & their Characteristics.

Unit II

INTRODUCTION TO COMPUTER ORGANIZATION .II
basic components of a computer system Control Unit, ALU. Input/Output function and Characteristics, memory RAM, ROM, EPROM, PROM.

Unit III

INPUT & OUTPUT DEVICES
Input Devices : Keyboard, Mouse, Trackball, Joystick, Digitizing tablet, Scanners, Digital Camera, MICR, OCR, OMR, Bar-code Reader, Voice Recognition. Light pen, Touch Screen.
Output Devices: Monitors Characteristics and types of monitor. Video Standard VGA, SVGA, XGA, LCD Screen etc. Printer, Daisy wheel, Dot Matrix, Inkjet, Laser, Line Printer. Plotter, Sound Card and Speakers

Unit IV

STORAGE DEVICES : Storage fundamental primary Vs Secondary.
Various Storage Devices magnetic Tape, Cartridge Tape, Data Drives, Hard Drives, Floppy Disks, CD, VCD, CD-R, CD-RW, Zip Drive, DVD, DVDRW

Unit V

INTRODUCTION TO OPERATING SYSTEM : Introduction to operating systems, its functioning and types. basic commands of dos & Windows operating System.
Disk Operating System (DOS)
• Introduction, History and Versions of DOS.
DOS Basics
• Physical Structure of disk, Drive name, FAT, file & directory stucture and naming rules, booting process, DOS system files.
DOS Commands
• Internal DIR, MD, CD, RD, Copy, DEL, REN, VOL, DATE, TIME, CLS, PATH, TYPE etc
• External CHKDSK, SCOPE, PRINT DISKCOPY, DOSKEY, TREE, MOVE, LABEL, APPEND, FORMAT, SORT, FDISK, BACKUP, MODE, ATTRIB HELP, SYS etc.
Books Recommended-

1. डॉ. एस. के. विजय, डॉ. पंकज सिह - कम्प्यूटर विज्ञान एवं सूचना प्रोद्योगिकी, मध्यप्रदेश हिन्दी ग्रंथ अकादमी, भोपाल
2. डॉ. पंकज सिंह कम्प्यूटर अध्ययन, राम प्रसाद एंड सस
3. डॉ. त्रिभुवननाथ पुक्ल – हिन्दी कंप्यूटिग, विकास प्रकाणन, कानपुर

Practical

Semester . V

Max. Marks& 25

DOS :
• DOS commands : Internal & External Commands.
• Special batch file : Autoexec, Bar Hard disk setup.
Windows 98:
• Desktop sening - New folder, rename bin operation, briefcase.

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function. control panel utility.
• Display properties: Screen saver, background settings.
Ms-Word:
• Creating file: save, save as HTML, Save as Text, template, RTF Formate.
• Page setup utility: Margin settings, paper size setting, paper source, layout,
• Editing: Cut, paste special, undo, redo, find, replace, goto etc.
• View file: page layout, Normal Outline, master document, ruler header, footer, footnote, full screen.
• Insert: break, page number, symbol, date & time, auto text, caption file, object, hyperlink, picture etc.
• Format: font, paragraph, bullets & numbering, border & shading, change case, columns.
• Table : Draw label, insert table, cell handling, table autoformat, sort formula.

Course Planer

• No. of Units - 5 Units
• No. of Marks - 50 marks
(Theory 25, Project 13, Practical 12)
• Total No. of Lectures required - 04 lecture/unit =Total 20
• Hours of Practical work required - 2 periods/weeks for 3 months=Total 24

BCA-V SEM

BCA-29 : COMPUTER GRAPHICS

Max Marks 50 (17)

UNIT-I

Introduction : Applications of Computer Graphics, Raster Graphics, Fundamentals; Scan conversion, Pixel, frame, buffer, Graphics Primitives : Line, Circle, Ellipse, character generation, polygon : representation, polygon filling algorithms, antialiasing

UNIT-II

Devices: Display Devices, random scan and raster scan monitors, color CRT monitor, direct view storage tube, Plasma Panel, Hardcopy devices : printers and plotters, Input Devices : Joysticks, mouse, digitizer, scanner, camera, Transformations : Translation, scaling, rotation, Shear, Reflection, homogeneous coordinates, composite transformation, concatenation properties, Raster method of transformation.

UNIT-III

Windowing and Clipping : Window, viewport, line clipping, polygon clipping, text clipping, Window & Viewport transformation, Display file concepts & Segmentation : display File, segment table, segment creation, deletion, rename, segment display file.

UNIT-IV

Interaction : Locator & Selector devices, interactive picture construction techniques, Three Dimensions : 3D geometry, 3D display techniques, transformation, viewing parameters.

UNIT – V

Hidden surface removal : Back face removal algorithm, Z buffers algorithm, Scan line algorithm, painter's algorithm,

Shading & Color Models : Diffuse illumination, point source illumination, specular reflection, refraction, shadows, colour, colour models, dithering, halftoning

Curves & Surfaces : Interpolation algorithm for curve fitting, B splines, bezier curves, fractals.

Books Recommended:

1. D. Hearn and Baker : Computer Graphics, Prentice Hall of India Pvt. Ltd.
2. Steven Harrington Computer Graphics, MGH.
3. Newman and R.F. Sproull : Principles on Interactive Computer Graphics, MGH.
4. W.K. Giloi : Interactive Computer Graphics, PHI.
5. R.A. Piastock and G. Kalley : Theory and Problems of Computer Graphics, MGH

R.K. Tatale

BCA-V SEM

BCA-30 : DISCRETE MATHEMATICS

Max Marks 50 (17)

UNIT – I

Mathematical Logic: Propositions and logical operators, Truth tables, equivalence and implementation, Laws of logic, Quantifiers. Set theory: Introduction, concept of set of theory relation, types of relation, equivalence relation.

UNIT – II

Boolean Algebra and its properties, Algebra of propositions and examples, De-Morgan's Laws, Partial order relations, g.l.b, l.u.b. greatest lower found least upper found, Algebra of electric circuits and its applications. Design of simple automatic control system

UNIT – III

Graph: Simple and multigraph. Incidence and degree. Paths, walk, cycles and circuit. Isomorphism, subgraphs. Connectedness, algorithm, complete and regular graphs. Operations on graphs. Euler graph, bipartite graphs. Shortest path algorithms: travelling salesman problem. Hamiltonal paths

UNIT – IV

Trees: Properties of trees, pendant vertices. Centre of a tree, rooted and binary trees, spanning trees - spanning tree algorithms, fundamental . circuits; spanning trees of a weighted graph: cutsets and cut-vertices; fundamental cutsets; connectivity and seperativity; network. flows; max-flow min-cut theorem.

UNIT – V

Plan on graphs, dual graphs, Kuratowski's two graph, matrix representation of graphs, incidence matrix, directed graphs, digraphs, directed paths and connectedness. Eular digraphs.

Books Recommended:

1. Harry, F.: Graph theory. Addison Wesley Publ Co.
2. Trembley J. P. & Manohar R: Discrete Mathematical Structures with Application to Computer Science, TMH.
3. S. Lipchutz: "Finite Mathematics", Schaum Series, MGH
4. Lin, C.L Elements of Discrete Mathematics, MGH.
5. Deo, N. Graph Theory, PHI

R. K. Kataria

BCA-V SEM

BCA-31 : [illegible] PROGRAMMING IN JAVA

Max Marks 50 (17)

UNIT I

Introduction to Object Oriented Programming: Basic concepts, benefits of OOPS, Application of OOP, Java evolution : history, features, C, C++ & Java a comparison, Java and WWW, HW, & SW requirements for Java. Structure of simple Java program. Java tokens, statements, Java virtual machine, command line arguments, programming style, constants & variables, symbolic constants, type casting; Various operators in Java (arithmetic, relational, logical , assignment, increment, decrement, conditional, bitwise & special operator); arithmetic expressions & their evaluation, precedence of arithmetic operators, type conversations in expressions, operator precedence and associativity, mathematical functions.

UNIT II

Decision making and branching; Decision making with if statement, simple if statement, the if ...else statement, nesting of if.. .else statements, the else if Ladder, the switch statement, The ? operators, the while statement, the do statement, the do statement, the for statement, jump in loops, labeled loops, classes, objects and methods: Defining a class, objects and methods; Defining a class, adding variables and methods, creating objects, accessing class members, constructors, method overloading, static members, nesting of methods inheritance; extending a class, overriding methods, final variables and methods, final classes, finalize methods, abstract methods and classes visibility control.

UNIT III

Arrays, strings and vectors; Arrays, one dimensional arrays, creating an array, two dimensional arrays, strings, vectors, wrapper classes, defining interfaces, multiple inheritance, extending interfaces, implementing interfaces, accessing interface variable, Packages: Java API packages, using system packages, naming conventions, creating packages, accessing a package, using a package, adding a class to a package, hiding classes.

UNIT IV

Multithreaded programming; creating threads, extending the thread class, stopping and blocking a thread, life cycle of a thread, using thread methods, thread exceptions, thread priority, synchronization, implementing the runnable interface elements algorithms, thrashing, other consideration, demand segmentation.

UNIT V

Applet programming; Local and remote applets, how applets differ from applications, preparing to write applets, building applets code, applet life cycle, creating and executable applet, designing a web page, adding applet to HTML file, running the applet, more about applet tag, passing parameters to applets, aligning the display, more about HTML tags, displaying numerical values, getting input from the user.

Book Recommended:

1. Programming with Java a primer by E. Balagurusamy.
2. Peter Norton's Guide to Java Programming, Techmedia Pub.
3. Mastering in Java, Techmedia Pub.schatz & Galvin
4. Core JAVA 2 Volume_I Fundamentals Sun Microsystems

R.K. Katare

BCA-V SEM

BCA-32: OPERATING SYSTEM

Max Marks 50 (17)

UNIT–I

Fundamental Concepts of Operating Systems: Evolution of operating systems - Serial processing, Batch Processing, Multi -programming, Types of Operating systems- Batch operating system, Time-sharing operating systems, Real-time operating system, multitasking operating system, distributed operating system. Overview of Process Management, Memory Management, File Management, Device Management, Operating system services,

UNIT-II

Process Management : Process concept, process scheduling, operation on processes, threads, enterprises communication, basic concepts, scheduling criteria, scheduling algorithms, Multiple processor scheduling, real-time scheduling, algorithm evaluation.

UNIT-III

Inter Process Synchronization: Concurrent processes, the critical section problem, the Critical Region and Conditional Critical Region problem, Inter process synchronization, Inter process communication, Deadlock occurrence, Deadlock characterization, Deadlock prevention, Deadlock avoidance, Deadlock detection and recovery.

UNIT-IV

Memory Management: Single Process Monitor, Static Partitioned memory allocation, Swapping, Relocation, Dynamic Partitioned memory allocation , Compaction, Multiple fence register Segmentation - Address translation, Descriptor caching, Paging, Page allocation, Virtual memory, Instruction interruptability, Management of virtual memory, Page replacement, Replacement algorithms, Comparison of various memory management techniques with reference to Protection and sharability.

UNIT-V

File and Device Management: File system organization, File operations, Access methods, Directory structure organization, File protection - Goals of protection, Access matrix model of protection, Dynamic Protection Structure, Security encryption, Device management: Dedicated, Shared and Virtual devices, Sequential Access and Direct Access devices, Channel and Control Units, I/O buffering, I/O schedulers, Spooling system.

Books Recommended:

1. Peterson & Siberschatz : Operating system concepts, Sybex.
2. Senart E. Madnik and J.J Donovan : Operating Systems, McGraw Hill.
3. Milan Melankovic : Operating Systems, Concept and Design, McGraw Hill
4. Lister Andrew : Fundamentals of Operating Systems, Macmilan Pub Co.
5. Deitel : An Introduction to Operating System, Addition Wesley.

K.K. Latare

BCA-VI SEM

Max Marks 50 (17)

Subject FC-VI-1-- Foundation Course
Paper Title - संप्रेषण एवं संचार संधान

इकाई – 1

1. वैश्विक चेतना- आशय और उद्देश्य
2. संचार संसाधन : सम्पर्क के क्षितिज

इकाई – 2

1. रेडियो
2. समाचार पत्र

इकाई – 3

1 रंगमंच
2. सिनेमा
3. दूरदर्शन

इकाई – 4

1. कम्प्यूटर : परिचय
(क) अर्न्तजाल (इंटरनेट)
(ख) ई–मेल
(ग) वेयकेम (दष्ण्य संवाद)
(घ) संवाद (चेटिंग)

इकाई – 5

1. दूरभाष – विज्ञान की सौगात
2. मोबाइल
(क) नए युग की दस्तक
(ख) वरदान और अभिशाप

R.K. Katare Shivastava

BCA-VI SEM

Max Marks 50 (17)

Subject FC-VI-2- Foundation Course
Paper Title - Paper II English Language and Aspects of Development
& Texts for Units I & II:
1 William Wordsworth, .The World is too much with us..
2. Kalpana Sharma, Hitting Dowry for a Six, .(*The Hindu*, 1 June 2003)
3. Ashok Vajpeyi and Anil Sharma, *Images Beyond the Surface : Madhya Pradesh*, pages 17-20.
4. Sushant Shetty, .A Great Hangout!., section 2 (pages 58-60, *Reader.s Digest*, September 2007)
5. .Is Print Dead?. From *How Did It Really Happen?* Reader.s Digest Publication.
6. J. Krishnamurti, .Rational Viewpoints..
7. C.V. Raman, . The Spirit of Science.. Extract from the Convocation Address, Agra University, 18 November 1950.

Unit I:
Short-answer questions.
5x2=10
Unit II:
100-word questions.
2x5=10
Unit III:
Short essay of about 250-300 words. Three alternative topics to be provided, candidates to attempt any one
Unit IV:
Translation of a short passage of about 100 words from Hindi to English.
Unit V:
Drafting a CV, writing **e-mail) messages** for business or official purposes.

R.K. Latare Shivlal

BCA-VI SEM

Subject FC-VI-3- Foundation Course
Paper Title - Paper III Basic Computer Information Technology -II

Max. Marks 25

Unit I .

Word Processing : Word
- Introduction to word Processing.
- MS Word: features. Creating, Saving and Operating Multi document windows, Editing Text selecting, inserting, deleting moving text.
- Previewing documents, Printing document to file page. Reduce the number of pages by one.
- Formatting Documents: paragraph formats, aligning Text and Paragraph, Borders and shading, Headers and Footers, Multiple Columns.

Unit IIIntroduction
to Excel
Excel & Worksheet .
- Worksheet basic.
- Creating worksheet, entering data into worksheet, heading information, data text, dates, alphanumeric, values, saving & quiting worksheet.
- Opening and moving around in an existing worksheet.
- Toolbars and Menus, keyboard shortcuts.
- Working with single and multiple workbook coping, renaming, moving, adding and deleting. coping entries and moving between workbooks.
- Working with formulas & cell referencing.
- Autosum.
- Coping formulas
- Absolute & Relative addressing.

Unit IIIINTRODUCTION
TO POWER POINT
- Features and various versions.
- Creating presentation using Slide master and template in various colour scheme.
- Working with slides make new slide move, copy, delete, duplicate, lay outing of slide, zoom in or out of a slide.
- Editing and formatting text: Alignment, editing, inserting, deleting, selecting, formatting of text, find and replace text.

Unit IVPOWER
POINT . II
- Bullets , footer, paragraph formatting, spell checking.
- Printing presentation Print slides, notes, handouts and outlines.
- Inserting objects Drawing and Inserting objects using Clip Arts picture and charts
- Slide sorter, slide transition effect and animation effects.

Presenting the show making stand alone presentation, Pack and go wizards.
Unit VEvolution,
Protocol, concept, Internet, Dial-up connectivity, leased line, VSAT, Broad band, URLs, Domain names, Portals. E-mail, Pop & web based Email. Basic of sending and receiving Emails, Email & Internet

Ethics Computer virus, Antivirus software wage, Web Browers.
Books Recommended-
1- MkW- ,l- ds- fol;] MkW- izdt flag % dEl;wVj loKku ,oa lwpuk izks|ksfxdh] e rzns.k fgUnh xzaFk vdkneh] Hkksiky
2- MkW- ladt flag dEl;wVj v/;;u] jke izdkn ,eM lal
3- MkW- f=Hkqouukfk 'kqDy & fgUnh dal;wfVax] fodkl izdk.ku] dkuiqj
Department of Higher education, Govt. of M.P.
Semester wise Syllabus for Under Graduates
As recommended by Central board of Studies and
Approved by HE the Governor of M.P.
Session 2010-11
B.A./B.Sc /B.Com./B.H.Sc. Final
Practical
Semester . VI
Max. Marks& 25
& Ms-Power Point:
Creating new slide, formatting slide layout, slide show & sorter, Inserting new slide, slide no., date, time, chart, formatting slide, tool operation.
List of suggested practical work:
□ Under standing of a dial up connection through modem.
□ Configuring a computer for an e-mail and using outlook Express or Netscape Messenger.
□ Registration an e-mail address.
□ Understanding of e-mail drafting.
□ Understanding of address book maintenance for e-mail.
□ Understanding of different mail program tools.
□ Send and receive functions of e-mail.
Note- Minimum laboratory timing of six hours in a week.
Course Plane:
□ No. of Units - 5 Units
□ No. of Marks - 50 marks
(Theory 25, Project 13,
Practical 12)
□ Total No of Lectures required - 04 lecture/unit =Total 20
□ Hours of Practical work required - 2 periods/weeks for 3 months=Total 24

BCA-VI SEM

BCA-36: SOFTWARE ENGINEERING

Max Marks 50 (17)

UNIT-I

Introduction: The product and the process, program vs software products, Emergence of software engineering, software development life cycle models, classical waterfall, iterative waterfall, prototyping, evolution, spiral & RAP model, comparison of various life cycle models, project management process, process management process.

UNIT- II

Software Requirement Analysis & Specification (SRAS) . Need for software requirement specification, requirement process, requirement analysis, requirement specification, planning a software project: cost estimation, project scheduling, staffing & personnel planning, software configuration management, plans: quality assurance plan, risk management

UNIT-III

Software Design : Criteria for Software design, software design & design principle; module level concepts: Coupling and Cohesion, design notation & specifications, design methodology, verification, object oriented design: Basic concepts, design methodology & Metrics, object oriented vs function oriented design, detailed design.

UNIT-IV

Coding and Testing : Standard guideline for coding, programming practice, testing fundamentals, unit testing, verification vs validation, black box & white box testing, functional testing, structural testing, object oriented program testing.

UNIT-V

Software reliability & quality assurance: Reliability metrics, growth and modeling, software quality management system, evolution, ISO 9000, CASE: scope and benefit, support in software life cycle, CASE tools, hardware and environmental requirements, architecture of a CASE environment, Software maintenance

Books Recommended:

1. Pankaj Jalote: An Integral Approach to Software Engineering, Narosa
2. Rogers Pressman: Software Engineering, a practitioner's approach, MGH
3. Rajib Mall: Fundamental of Software Engineering, PHI
4. Richard Farley: Software Engineering Concept, TMH

BCA-VI SEM

BCA-37 : RDBMS

Max Marks 50 (17)

UNIT-I

Interactive SQL: involving SQL plus, data manipulation in DBMS, the oracle data types, creating a table, creating a table from a table, insertion of data into tables, updating the contents of a table, deletion operations, the select command, many faces of the select command, modifying the structure of tables, removing/deleting/dropping tables:

UNIT-II

Data Constraints: column level and table level constrains, NULL value concepts primary key concepts, unique key concepts, default value concepts, the foreign - key references constraints, CHECK integrity constraints, defining different constraints on the table, defining integrity constraints in the ALTER TABLE command, dropping integrity constraints in the alter table command, computations in expression lists used to select data, logical operators, range searching, pattern matching, oracle functions, grouping data from tables in SQL, manipulating data in SQL

UNIT-III

Joins: joining multiple tables (equi joins), joining a table to itself (self joins): sub queries, using the union, intersect and minus clause, indexes, views: creation of views, renaming the column of a view, using view, selecting a data set from a view, updatable views, destroying a view, granting permissions: permission on the objects created by the user, granting permissions using GRANT statement, object privileges, with grant option, referencing a table belonging to another user, granting permissions to another user, revoking the permissions given.

UNIT-IV

PL/SQL: introduction, performance, performance improvement, portability, PL/SQL data types, what PL/SQL can do for programming, the PL/SQL execution environment, the PL/SQL syntax, the character set, understanding the PL/SQL block structure, oracle transactions, locks, cursors, error handling in PL/SQL, stored procedures: what are procedures, where do procedures reside, how oracle create a procedure, how oracle executes procedures, advantages of procedures, syntax for creating stored procedure, an application using a procedure, deleting a stored procedure.

UNIT-V

Stored functions what are functions, where do functions reside, how oracle crates a function, how oracle executes a function, advantages o functions, syntax for creating a stored function, an application using a function, deleting a stored function, database triggers: introduction, use of database triggers, how to apply database triggers.

BOOKS RECOMMENDED:

1. Ivan Bayross: Oracle Developer 2000 BPB Pub.
2. Liebschuty: The oracle cook book, BPB Pub.
3. Michael Abbey & Michael J. Corey : Oracle Beginners guide TMH.

K.K. Kalese

SYLLABUS

B.Sc. (Honours)

CHEMISTRY/BIOCHEMISTRY

(Foundation Course)

For

Session

2018-19

2019-20

2020-21

Department of Chemistry

A.P.S. University, Rewa (M.P.)

SESSION	***2018-19***
CLASS	***B.Sc. CHEMISTRY (HONS.)***
SEMESTER	***I***
PEPER	***H-I***
TITLE OF THE PAPER	**Organic and Inorganic Chemistry**
Max.	***70***

Unit-I: Alcohols and Phenols

Alcohols: Classification and nomenclature. Monohydric alcohols- nomenclature, methods of formation of reduction of aldehydes, ketones, carboxylic acids and esters. Hydrogen bonding. Acidic nature, Reactions of alcohols. dihydric alcohols nomenclature, methods of formation, chemical reactions of vicinal glycols, oxidative cleavage [$Pb(OAc)_4$ and HIO_4] and pinacol-pinacolone rearrangement. Trihydric alcohols-nomenclature and methods of formation, chemical reactions of glycerol.

Phenols: Nomenclature, structure and bonding, Preparation of phenols, physical properties and acidic character. Comparative acidic strengths of alcohols and phenols, resonance stabilization of phenoxide ion. Reactions of phenols- electrophonic aromatic substitution, acylation and carboxylation. Mechanisms of Fries rearrangement, Claisen rearrangement, Gaiterman synthesis, Hauoen-Hoesch reaction. Lederer- Manasse reaction and Reimer, Tiemann reaction.

Unit-II: Aldehydes and Ketones

Nomenclature and structure of the carbonyl group. Synthesis of aldehydes and ketones with particular reference to the synthesis of aldehydes from acid chlorides, synthesis of aldehydes and ketone using 1,3-dithianes, synthesis of ketones from nitriles and from carboxylic acids. Physical properties. Mechanism of nucleophilic additions to carbonyl group with particular emphasis on benzoin, aldol, Perkin and Knoevengel condensations. Condensation with ammonia and its derivatives. Wittig reaction, Mannich reaction, Use of acetais as protecting group. Oxidation of aldehydes, Baeyer-Villiger oxixationol ketones. Cannizzaro's reaction. Meerwine Pondorof Verlay, Clemmensen, wolff-Kishner, LiAIH4 and NaBH4 reduction. Halogenation of enolizable ketones. An introduction to α, β unsaturated aldehydes and ketones.

Unit-III: P-Block Elements

Comparative study (including diagonal relationship) of groups 13-17 elements, compounds like hydrides, oxides, oxyacids and halides of groups 13-16. Hydrides of boron-diborane and higher boranes. Borazine, borohydrides Fullerenes, carbides, fluorocarbons, silicates (structural principle), tetrasulphur tetra nitride, basic properties of halogens, interhalogens.

Noble Gases: Chemical properties of the noble gases, chemistry of xenon, structure and bonding in xenon compounds.

Unit-IV: Chemistry of Elements of First Transition Series

Characteristic properties of d block elements. Properties of the elements of the first transition series their Binary compounds such as Carbides, Oxides and Sulhphides.

Complexes: Complexes illustrating relative stability of their oxidation states, coordination number and geometry.

Unit-V: Non-aqueous Solvents

Physical properties of solvent, types of solvents and their general characteristics, reactions in non-aqueous solvents with reference to liquid NH_3 and liquid SO_2.

Acids and Bases: Arrhenius, Bronsted- Lowry, the Lux-Flood solvent system and Lewis concepts of acids and bases.

SESSION	***2018-19***
CLASS	***B.Sc. CHEMISTRY (HONS.)***
SEMESTER	***I***
PEPER	***H-II***
TITLE OF THE PAPER	**Elements of Biochemistry**
Max.	***70***

Unit-I: Carbohydrates

Monosaccharide, Disaccharides, polysaccharides, Biological significance of carbohydrates, Bio synthesis of Disaccharides, polysaccharides. Nucleic Acids- Physical configuration of nucleic acids, chemical composition of nucleic acids, structures of purines and pyrimidines bases. Biological significance of nucleic acids, mechanism of Enzymes action Enzymes and co-enzymes.

Unit-II: Amino Acids & Proteins

Structure of protein amino acids, properties of amino acids and their synthesis of amino acids, catabolism of amino acids. Proteins- The chemical structure of proteins, properties of proteins, biological significance of proteins, mechanism of protein synthesis, Control of protein synthesis.

Unit – III Fats Oils and Detergents

Natural fats, edible and industrial oils of vegetable origin, common fatty acids, glycerides, hydrogenation of unsaturated oils. Saponification value, iodine value, acid value. Soaps, synthesis detergents, alkyl and aryl sulphonates.

Unit-IV: Enzymes & Co-enzymes

Definition, classification and nomenclature of Enzymes, Physio-chemical nature of Enzymes, Enzyme kinetics, mechanism of Enzymes action, factors affecting enzyme activity, co-enzymes and its Biological significance. Mechanism of co-enzymes action.

Unit-V: Nucleic acids:

Nucleic acid, Introduction, Constituents of nucleic acids. Ribonucleosides and ribonucleotides. The double helical structure of DNA.

SESSION	***2018-19***
CLASS	***B.Sc. CHEMISTRY (HONS.)***
SEMESTER	***II***
PEPER	***H-III***
TITLE OF THE PAPER	**Organic & Physical Chemistry**
Max.	***70***

Unit-I: Arenes and Aromaticity

Nomenclature of benzene derivatives. The aryl group Aromatic nucleus and side chain Structure of benzene molecular formula and Kekule structure. Stability and carbon-carbon bond lengths of benzene, resonance structure. MO picture. Aromaticity the Huckel rule, aromatic ions. Aromatic electrophilic substitution general pattern of the mechanism, role of (a and n complexes), Mechanism of nitration, halogenation, sulphonation, mercuration and Friedel-Crafts reaction. Energy profile diagrams. Activating and deactivating substituent's, orientation and ortho/para ratio. Side chain reactions of benezene derivatives. Birch reduction. Methods of formation and chemical reactions of alkylbenzenes, alkynylbenzenes and biphenyl.

Unit-II: Alkenes

Nomenclature of alkenes, methods of formation, mechanisms of dehydration of alcohols and dehydrohalogenation of alkyl halides, regio-selectivity in alcohol dehydration the Saytzeff rule, Hoffmann elimination, physical properties and relative stabilities of alkenes. Chemical reactions of alkenes mechanisms involved in hydrogenation, electrophilic and free radical additions, Markownikoff's rule, hydroboration-oxidation oxymercuration-reduction, Epoxidation, ozonolysis, hydration, hydroxylation and oxidation with KMnO4, polymerization of alkenes, Substitution at the allylic and vinylic positions of alkenes, industrial applications of ethylene and propene.

Unit-III: Alkyl and Aryl Halides

Nomenclature and classes of alkyl halides, methods of formation, chemical reactions mechanism of nucleophilic substitution reaction of alkyl halides. SN2 and SN1 reactions with energy profile diagrams. Polyhalogen compounds : chloroform, carbon tetrachloride. Methods of formation of aryl halides, nuclear and side chain reactions. The addition elimination and the elimination-addition mechanisms of nucleophilic aromatic substitution reactions. Relative reactivities of alkyl halides versus allyl, vinyl and aryl halides. Synthesis and uses of DDT and BHC, Freon.

Unit-IV: Chemical Kinetics

Chemical Kinetics-I Chemical kinetics and its scope, rate of a reaction, factors influencing the rate of a reaction-concentration, temperature, pressure, solvent, light, catalyst concentration dependence of rates, mathematical characteristics of simple chemical reactions-zero, order, pseudo order, half life and mean life. Determination of the order of reaction differential method, method of integration, method of half life period and isolation method.

Chemical Kinetics-II Experimental methods of chemical kinetics-conductometric, potentiometric, optical methods, polarimetry and spectrophotometer. Theories of chemical kinetics: effect of temperature on rate of reaction, Arrhenius equation, concept of activation energy. Simple collision theory based on hard sphere model, transition state theory (equilibrium hypothesis.) Expression for the rate constant based on equilibrium constant and thermodynamic aspects

Unit-V Colloidal State: Definition of colloids, classification of colloids. Solids in liquids (sols): properties- Kinetic, optical and electrical; stability of colloids, protective action, Hardy-Schulz law, gold number, Liquids in liquids (emulsions) types of emulsions, preparation. Emulsifier, Liquids in solids (gels): classification, preparation and properties, inhibition, general applications of colloids. Green chemistry Introduction to green chemistry what is green chemistry? need for green chemistry. goals of green chemistry. Limitations/obstacles in the pursuit of the goals of green chemistry. Examples of green synthesis/reactions. green synthesis of the following compounds: adipic acid, catechol, BHT, methyl methacrylate, urethane, aromatic amines (4- aminodiphenylamine), benzyl bromide, acetaldehyde, disodium iminodiacetate (alternative to strecker synthesis), citral, ibuprofen, paracetamol, turtural. oxidation reagents and catalysts; biomimetic, multifunctional reagents; combinatorial green chemistry; proliferation of solvent less reactions; on covalent derivatization; green chemistry in sustainable development

SESSION	***2018-19***
CLASS	***B.Sc. CHEMISTRY (HONS.)***
SEMESTER	***II***
PEPER	***H-IV***
TITLE OF THE PAPER	***Physical & Inorganic Chemistry***
Max.	***70***

Unit-I: Mathematical Concepts and Computer

Mathematical Concepts*:* Logarithmic relations, (rules and types), use of log table and antilog table in calculations, curves sketching, straight line and linear graphs, calculation of slopes, Differentiation of functions like Kx, ex , x n , sinx, logx; multiplication and division in differentiation, maxima and minima, partial differentiation and reciprocity relations. Integration of some useful/relevant functions; Factorials, Probability.

Computer: General introduction to computer different components of a computer Hardware and software, input-output devices binary number and arithmetic; introduction to computer languages Programming and operating systems.

Unit-II: Gaseous States and Molecular Velocities

Gaseous States and Molecular Velocities: Critical phenomenon : PV isotherms of ideal gases, Andrew's experiment, continuity of states, the isotherms of Vander Waals equations, relationship between critical constants and Vander Waals constants, Root mean square, average and most probable velocities. Qualitative discussion of the Maxwell's distribution of molecular velocities, collision numbers, mean free path and collision diameter.

Liquid State: Intermolecular forces, structure of Liquids (a qualitative description) Liquid crystals: Difference between liquid crystal, solid and liquid. Classification, structure of nematic and cholestric phases. Thermography and seven segment cell.

Unit-III: Atomic Structure

Elementary Quantum Mechanics: Idea of de Broglie matter waves, Heisenberg uncertainty principal, atomic orbital's, Shapes of *s, p, d* orbitals, Schrodinger wave equation, significance of ψ and $\psi 2$, radial and angular wave functions and probability distribution curves, effective nuclear charge.

Unit IV: Periodicity of Elements

Definition, periodicity of elements long form of periodic table. Detailed discussion of the following properties of the elements, with reference to *s* & *p*- block. (a) Effective nuclear charge, shielding or screening effect, Slater rules, variation of effective nuclear charge in periodic table.(b) Atomic radii (van der Waals), factors affecting Atomic radii; (c) Ionic radii; (d) Covalent radii; (e) Ionization enthalpy/Ionization potential, factors affecting ionization energy; (f) Electron gain enthalpy (Electron affinity), factors affecting electron gain enthalpy, trends of Electron gain enthalpy (Electron affinity) in periodic table. (g) Electronegativity, trends of Electronegativity in periodic table, Pauling's/ Mulliken's and Mulliken-Jaffe's electronegativity scales. Hund's rules, Afabau rule and pauli's exclusion law.

Unit V: Chemical Bonding

Chemical Bonding: Covalent bonding as applied to valence bond theory and its limitations, directional characteristic of covalent bond. Hybridization and shapes of simple molecules and ions, Valence Shell Electron Pair Repulsion (VSEPR) theory to NH_3, SF_4, CIF_3, ICI_2, H_2O.

SESSION	***2019-20***
CLASS	***B.Sc. CHEMISTRY (HONS.)***
SEMESTER	***III***
PEPER	***H-V***
TITLE OF THE PAPER	**Organic & Inorganic Chemistry**
Max.	***70***

Unit I: Structure and Bonding

Hybridizations, Bond length, and bond angles, bond energy; Localized and delocalized chemical bond, vander Waal's interaction, inclosing compound, clatherates, charge transfer complex . resonance, hyper conjugation. Aromaticity, inductive and field effect hydrogen bonding

Mechanism of Organic reaction: Curved arrow notation . drawing electron movement with arrows half headed and double headed arrow homolytic and hetrolytic bond breaking

Types of Reagents: Electrophiles and nuclophiles. Types of organic reaction. Energy consideration, Reactive intermediates carbocations, carbanions, free radicals Methods of determination of reaction mechanism .

Unit –II: Stereochemistry

Concealments of symmetry .molecular cherallity. enantiomers estrogenic centers optical activity properties of enantiomers chiral and achiral molecule with two stereogenic centres distereoisomer mesocompound resolution of enantiomers inversion and recemization Relative and absolute configuration sequence rule D&L, R&S system of nomenclature , Nomenclature E&Z system geometrical isomerism in alicyclic compound Conformatioept of isomerism .types of isomerism optical isomerism n ,conformational analysis of ethane and n-butane Conformation of cyclohexane axial and equatorial bonds Newman projection and saw horse formula Fiecher and Flying wedge formula.

Unit-III: Alkanes and Cycloalkanes

IUPAC nomenclature, classification isomerism in alkanes sources and methods of preparation (with special reference Wurtz, Kolbe, Corey's House reaction and decarboxylation of carboxylic acid) Physical properties and chemical reactions of alkanes. Mechanism of free radical halogenations of alkanes. Cyclo alkane: Nomenclature methods of preparation chemical reaction , Bayer's strain theory and its limitation ring strain in cyclopropane cyclobutane , theory of stainless rings

Unit –IV: S- Block Elements

Comparative study diagonal relationship salient feature of hydrides salvation and complexation tendencies including their function in biosystems an introduction to alkyl and aryls.

Unit-V: Solid State

Definition of space lattice Unit cell Laws of crystallography –(i) Law of constancy of interfacial angles (ii) law of rationality of indices (iii) law of symmetry .Symmetry elements in crystals. X-ray diffraction by crystal Derivation of Bragg's equation Determination of crystals structure of NaCl ,KCl and CsCl (Laue's methods and powder methods.) Catalysis characteristics of catalyzed reaction classification of catalysis miscellaneous Example.

SESSION	***2019-20***
CLASS	***B.Sc. CHEMISTRY (HONS.)***
SEMESTER	***III***
PEPER	***H-VI***
TITLE OF THE PAPER	**Advanced Chemistry-I**
Max.	***70***

Unit-I: Electromagnetic Spectrum

Absorption Spectra: Ultraviolet (UV) absorption spectroscopy- absorption laws (Beer-Lambert's law). Molar absorptivity, presentation and analysis of UV spectra, types of electronic transitions, effect of conjugation, Concept of chromophore and auxochrome. Bathochromic, hypsochromic, hyperchromic and hypochromic shifts. UV spectra of conjugated enes and enones.

Infrared (IR) absorption spectroscopy: Molecular vibrations Hooke's law, selection rules, intensity an deposition of IR bands, measurement of IR spectrum, fingerprint region, characteristic absorptions of various functional groups and interpretation of IR spectra of simple organic compounds.

Unit-II: Thermodynamics-I

Definition of thermodynamic terms: system, surrounding etc. Types of systems, intensive and extensive properties. State and path functions and their differentials. Thermodynamic process. Concept of heat and work.

First law of Thermodynamics: Statement, definition of internal energy and enthalpy. Heat capacity, heat capacities at constant volume and pressure and their relationship. Joule's law Joule-Thomson coefficient and inversion temperature. Calculation of W, q. dU and dH for the expansion of ideals gases under isothermal and adiabatic conditions for reversible process.

Thermochemistry: Standard state, standard enthalpy of formation- Hess's Law of heat summation and its applications. Heat of reaction at constant pressure and at constant volume Enthalpy of neutralization. Bond dissociation energy and its calculation from thermo-chemical data, temperature dependence of enthalpy. Kirchoffs equation.

Second Law of Thermodynamics: need for the law, different statements of the law, Carnot cycle and its efficiency, Cannot theorem. Thermodynamic scale of temperature.

Unit-III: Thermo dynamics-II

Concept of entropy: Entropy as a state function, entropy as a function of V&T, entropy as a function of P&T, entropy change in physical change, Clausius inequality, entropy as a criteria of spontaneity and equilibrium, Entropy change in ideal gases and mixing of gases. Third Law of thermodynamics: Nernst heat theorem, statement and concept of residual entropy, evaluation of absolute entropy from heat capacity data.

Thermodynamics-III: Gibbs and Helmholtz functions: Gibbs function (G) and Helmholtz function (A) as thermodynamic quantities, A & G as criteria for thermodynamic equilibrium and spontaneity, their advantage over entropy change. Variation of G and A with P.V and T.

Chemical Equilibrium: Equilibrium constant and free energy. Thermodynamic derivation of law of mass action. Le Chateliers principle. Reaction isotherm and reaction isochors- Clapeyron equation and Clausius- Clapeyron equation applications.

Unit-IV: Chemistry of Lanthanide Elements:

Electronic structure, oxidation states and ionic radii and lanthanide contraction, complex formation, occurrence and isolation of lanthanide compounds.

Chemistry of Actinides: General features and chemistry of actinides, chemistry of separation of Np, Pu, and Am from U, similarities between the later actinides and the later lanthanides.

Unit-V: Organic Compounds of Nitrogen:

Preparation of nitroalkanes and nitroarenes. Chemical reactions of nitroalkanes. Mechanisms of nucleophilic, Substitution in nitroarenes and their reductions in acidic, neutral and alkaline media. Picric acid.

Halonitroarenes: Reactivity, structure and nomenclature of amines, physical properties. Stereochemistry of amines, Separation of a mixture of primary, secondary and tertiary amines. Structural features effecting basicity of amines. Amine salts as phase-transfer catalysts. Preparation of alkyl and aryl amines (reduction of nitro compounds, nitriles), reductive animation of aldehydic and ketonic compounds. Gabriel-Phthalamide reaction, Hoffmann bromamide reaction. Reactions of amines, electrophilic aromatic. Substitution in aryl amines, reactions of amines with nitrous acid. Synthetic transformations of aryl diazonium salts azo coupling.

SESSION	***2019-20***
CLASS	***B.Sc. CHEMISTRY (HONS.)***
SEMESTER	***IV***
PEPER	***H-VII***
TITLE OF THE PAPER	**Advanced Chemistry -II**
Max.	***70***

Unit-I: Electrochemistry-I

Electrical Transport: Conduction in metals and in electrolyte solutions, specific conductance and equivalent conductance, measurement of equivalent conductance, variation of equivalent and specific conductance with dilution. Migration of ions and Kohlrausch law, Arrhenius theory of electrolyte dissociation and its limitations, weak and strong electrolytes, Ostwald's dilution law its uses and limitations.

Unit-II: Electrochemistry-II

Debye-Huckel-Onsager's equation for strong electrolytes (elementary treatment only). Transport number, definition and determination by Hittorf method and moving boundary method. Applications of conductivity measurements: determination of degree of dissociation, determination of K2 of acids, determination of solubility product of a sparingly soluble salt, conducto metric titrations. Types of reversible electrodes: gas metal ion, metal-metal ion, metal-insoluble salt-anion and redox electrodes. Electrode reactions, Nernst equation, derivation of cell E.M.F. and single electrode potential, standard hydrogen electrodereference electrodes-standard electrode potential, sign conventions, electrochemical series and its significance. Electrolytic and Galvanic cells, reversible and irreversible cells, conventional representation of electrochemical cells. EMF of a cell and its measurements. Computation of cell EMF. Calculation of thermo dynamic quantities of cell reactions (AG5 AH and K), polarization, over potential and hydrogen.

Unit-III: Electrochemistry and Corrosion

Concentration cells with and without transport, liquid junction potential, application of conc cells, valency of ions, solubility product and activity coefficient, potentiometric titaration. Definition of pH and pK, determination of pH using hydrogen, quinhydrone and glass electrodes by potentiometric method. Buffers- Mechanism of buffer action, Handerson Hazel equation, hydrolysis of salts.

Corrosion: Types, Theories and methods of combating it.

Unit-IV: Coordination Compounds

Werner's coordination theory and its experimental verification, effective atomic number concept, chelates, nomenclature of coordination compounds, isomerism in coordination compounds, valence bond theory of transition.

Transition Elements-II: Comparative treatment of elements of second and third transition series magnetic behavior, spectral properties and stereochemistry.

Unit-V: Carboxylic Acid

Nomenclature, structure and bonding, physical properties, acidity of carboxylic acids, effects of substituent's on acid strength. Preparation of carboxylic acids. Reactions of carboxylic acids. Hell-Volhard-Zelinsky reaction. Synthesis of acid chlorides, esters and amides. Reduction of carboxylic acids. Mechanism of decarboxylation, methods of formation and chemical reactions of unsaturated monocarboxylic acids. Dicarboxylic acids: methods of formation and effect of heat and dehydrating agents, haloacids, hydroxyl acids-Malic, tartaric & citric acid.

Carboxylic Acid Derivatives: Structure and nomenclature of acid chlorides, esters, amides (urea) and acid anhydrides. Relative stability of acyl derivatives. Physical properties, inter conversion of acid derivatives by nucleophilic acyl substitution. Preparation of carboxylic acid derivatives, chemical reactions, Mechanisms of esterification and hydrolysis (acidic and basic).

SESSION	***2019-20***
CLASS	***B.Sc. CHEMISTRY (HONS.)***
SEMESTER	***IV***
PEPER	***H-VIII***
TITLE OF THE PAPER	**Industrial Chemistry**
Max.	***70***

Unit-I: Paint & Pigment

Classification of paints, constitution of paints. Setting of paints. Qualities of a good paint, paint failure, Methods of applies paints, baking, paint removers.

Pigment: Definition study of following pigments lithopone, titamiumdioxide ultramarine blue, zincoxide, white lead. Varnishes: - raw material manufacture of varnishes japaines.

Unit II: Pulp & Paper

Manufacture of pulp, sulfate pulp, rag pulp, benting, refining, flling, sizing & colouring manufacture of paper, calendaring ecological problems of Indian pulp & paper industry.

Unit-III: Cement Industries

Types of cements cementing materials, raw materials manufacture setting of cements, properties of cement, testing of cement, mortars & concrete, curing of concrete, decay of concrete. LIME manufacture of lime, properties of lime, setting & hardening of lime, gypsum, plaster of Paris.

Unit-IV: Fertilizers

Definition & classification of fertilizer manufacture of phosphate fertilizer (superphaspate triple superphaspate of calcium) manufacture of nitrogen fertilizers (urea & ammonium phosphate pollution caused by fertilizers, effects of fertilizers.

Unit-V: Soap and Detergents, Fats, Oil & Wax Soap and Detergents

Soap- manufacture, toilet and transparent soap, metal soap, cleaning action of soap. Principal group of synthetic detergent, classification of surface active agents, cationic detergents, non ionic detergents, amphoteric detergents, containing enzymes, eco friendly detergent. Manufacture of shampoos. Fat, Oil & Wax properties, Classification, Analysis, Manufacture and Refining of vegetable oils, animal and mineral oil, hydrocarbon oil, essential oil, oils as emollients, some common wax, solubility of wax, synthetic fat, oil and wax, manufacture of candel hydrogenation of oil.

SESSION	***2020-21***
CLASS	***B.Sc. CHEMISTRY (HONS.)***
SEMESTER	***V***
PEPER	***H-IX***
TITLE OF THE PAPER	**Complex and Polymer Chemistry**
Max.	***70***

Unit-I: Metal ligand bonding in transition metal complexes

Limitation of valence bond theory, an elementary idea of crystal field theory, crystal field splitting in octahedral, tetrahedral and square planner complexes, factors affecting the crystal field parameters.

Thermodynamics and kinetic aspects of metal complexes

A brief outline of Thermodynamic stability of metal complexes and factors affecting the stability, substitution reaction of square planner complexes Magnetic properties of transition metal complexes Types of magnetic behaviour, Methods of determining magnetic susceptibility, spin (only formula) LS coupling, correlation of μs (spin only) and μ effective values. Orbital contribution to magnetic moments, application of magnetic moment data for 3d metal complexes.

Unit-II: Electron spectra of transition metal complexes

Types of electronic transition, selection rules for d-d transition, spectroscopic ground states, spectrochemical series, Orgel energy level diagram for d1-d9 states, discussion of the electronic spectrum of $[Ti(H_2O)_\sigma]^{3+}$

Unit III: Synthetic polymers

Addition or chain- growth polymerization. Free radical vinyl polymerization. Ionic vinyl polymerization. Ziegler-Natta polymerization and vinyl polymers. Condensation or step growth polymerization. Polyesters, polyamides, phenol formaldehyde resins, urea formaldehyde resins, epoxy resins and polyurethanes. Natural and synthetic rubbers.

Unit IV: Organic Synthesis via Enolates

Acidity of α- hydrogen's Alkylation of diethyl malonate and ethyl acetoacetate. Synthesis of ethyl acetoacetate: Claisen condensation.Keto-enol tautomerism of ethyl acetoacetate. Alkylation of 1,3- dithianes, Alkylation and Acylation of enamines.

Unit V: Photochemistry

Interaction of radiation with matter, difference between thermal and photochemical processes. Laws of Photochemistry: Grothus-Draper law, Stark-Einstein law, Jablonski diagram depicting various processes occurring in the excited state, qualitative description of fluorescence, phosphorescence, non- radiative processes (internal conversion, intersystem crossing) quantum yield photosensitized reaction- energy transfer processes (simple examples).

SESSION	***2020-21***
CLASS	***B.Sc. CHEMISTRY (HONS.)***
SEMESTER	***V***
PEPER	***H-X***
TITLE OF THE PAPER	**Spectroscopy and Organometallic Chemistry**
Max.	***70***

Unit I: Organometallic Compounds

Definition, Nomenclature and classification of Organometallic Compounds , preparation, properties, bonding and applications of alkyls and aryls of Li, Al, Hg, Sn and Ti A brief account of metal- ethylenic complexes and homogeneous hydrogenation, mononuclear carbonyl and the nature of bonding in metal carbonyls. Organo- magnesium compounds: the Grignard reagents – formation, structure and chemical reaction. Organo-zinc compounds: Formation and chemical reactions. Organo-lithium compounds: Formation and chemical Reactions.

Unit II: Spectroscopy

Nuclear magnetic resonance (NMR) Spectroscopy, proton magnetic resonance (H NMR) Spectroscopy, nuclear shielding and de-shielding , chemical shift and molecular structure, spin-spin splitting and coupling constants, areas of signals , Interpretation of PMR spectra of simple organic molecules such as ethyl bromide, ethanol, acetaldehyde, 1,1,2- tribromoethane, ethyl acetate, toluene and acetophenone.

Structure elucidation- Problems pertaining to the structure elucidation of simple organic compounds using UV, IR and PMR spectroscopic techniques.

Unit III: Spectroscopy

Electromagnetic radiation, regions of the spectrum, basic features of different spectrometers, statement of the Born-Oppenheimer approximation, degrees of freedom.

Rotational spectrum : Diatomic molecules, Energy levels of a rigid rotor (semi-classical principles), selection rules spectral intensity, distribution using population distribution (Maxwell-Boltzmann distribution) determination of bond length, qualitative description of non- rigid rotor, isotope effect. Vibrational.

Infrared spectrum: Energy levels of simple harmonic oscillator, selection rules, pure vibrational spectrum, intensity, determination of force constant and qualitative relation of force constant and bond energies, effect of an harmonic motion and isotope on the spectrum, idea of Vibrational frequencies of different functional groups.

Raman spectrum: Concept of polarizability, pure rotation and pure vibrational Raman spectra of diatomic molecules, selection rules.

Unit IV: Physical Properties and Molecular Structure

Optical activity, polarization- (Clausius-Mossotti equation), orientation of dipoles in an electric field, dipole moment , induced dipole moment. Measurement of dipole moment- temperature and refractivity method, dipole moment and structure of molecules, magnetic properties- Paramagnetism, diamagnetism and ferromagnetics.

Unit V: Heterocyclic Compounds

Introduction: Molecular Orbital picture and aromatic characteristics of pyrrole, furan, thiophene and pyridine, Methods of synthesis and chemical reactions with particular emphasis on the mechanism of electrophilic substitution, Mechanism of nucleophilic substitution reactions in pyridine derivatives .Comparison of basicity of pyridine , Piperidine and pyrrole. Introduction to condensed five and six-membered heteroeycles ,Preparation and reactions of Indole , quinoline and isoquinoline With special reference to Fischer indole synthesis skraup synthesis and Bischler- Napieralski synthesis . Mechanism electrophilic substitution reaction of indole , quinoline and no isoquinoline.

SESSION	***2020-21***
CLASS	***B.Sc. CHEMISTRY (HONS.)***
SEMESTER	***V***
PEPER	***H-XI***
TITLE OF THE PAPER	***TECHNIQUES & INSTRUMENTATION***
Max.	***70***

Unit I: Voltammetry

General principle of voltammetry, principle of polarography, Polarographic wave, half wave potential and its importance, Ilkovic equation, principle of cyclic voltammerty, different applications of polarography and cyclic voltammerty.

Unit II: Chromatography

Principle and types of Chromatography, Introduction and applications, Paper chromatography, TLC, Column chromatography, GLC, HPLC, Affinity chromatography, Ion-exchange chromatography, Molecular sieving chromatography,

Unit III: Electrophoresis

Introduction, Principle and Types of Electrophoresis and factors affecting the rate of electrophoresis, Free and Zonal electrophoresis, Paper electrophoresis, Gel electrophoresis, Immuno-electrophoresis, Iso-electric focusing.

Unit IV: Centrifugation

Principle of Centrifugation, Types of centrifuges, Preparative and Analytical centrifugation, sedimentation coefficient, RCF, Factors affecting RCF, Ultracentrifugation, Applications in biology.

Unit V: Radioactivity

Production of Isotopes, Synthesis of labeled compounds, measurement of radioactivity, Methods based upon Gas ionization, Ionization chamber, Proportional counters, Geiger Muller counter, Methods based upon excitation - Liquid Scintillation Counting.

Microscopy: Principle of microscopy, types, compound light phase, contrast florescence microscope, electron microscope and application.

SESSION	***2020-21***
CLASS	***B.Sc. CHEMISTRY (HONS.)***
SEMESTER	***VI***
PEPER	***H-XII***
TITLE OF THE PAPER	***ENVIORNMENTAL CHEMISTRY***
Max.	***70***

Unit I: Enviornment

Introduction, Composition of atmosphere, vertical temperature, heat budget of the earth atmospheric system, vertical stability atmosphere. Biochemical cycles of C, N, P, S, & O, Biodistribution of elements.

Unit II: Hydrosphere

Chemical composition of water bodies- lakes, streams, rivers & wet lands etc. Hydrological cycle.

Aquatic pollution & water quality: Inorganic, organic, pesticide, agricultural, industrial and sewage, detergents, oil spills and oil pollutants. Water quality parameters- dissolved oxygen, biochemical oxygen demand, solids, metals, and contents of chloride soleplate, phosphate, nitrate and microorganisms. Water quality standards. Analytical methods for measuring BOD, DO, COD, F, Oils, metals (As, Cd, Cr, Hg, Pb, Se etc), residual chloride and chloride demand.

Unit III: Purification & treatment of water

Introduction, potability of water, sterilisarion and disinication of water by ozonization and silver ion method, removal of gas from water determination softening of water by lime soda process, determination of hardness of water by soap and titration method

Unit IV: Soils

Composition, micro and macro nutrients, pollution, fertilizers, pesticides, plastic and metals. Waste treatment.

Unit V: Atmosphere

Chemical composition of atmosphere- particles, ions, radicals and their formation. Chemical & photochemical reactions in atmosphere, smog formation. Oxides of N,C, S, O and their effects.

Air pollution: Pollution by chemicals, petroleum, minerals, chlorofluorocarbons. Green house effect, acid rain, air pollution controls and their chemistry. Analytical methods for measuring air pollutants. Continuous monitoring instruments.

SESSION	***2020-21***
CLASS	***B.Sc. CHEMISTRY (HONS.)***
SEMESTER	***VI***
PEPER	***H-XIII***
TITLE OF THE PAPER	**Pharmaceutical Chemistry**
Max.	***70***

Unit I: General pharmacology

Nature and sources of drugs, Routes of drug administration and Dosage forms, Absorption and Bioavailability of drugs, Factors affecting drug absorption, Distribution of drugs, Fate of drugs.

Unit II: Drug action

Mechanism of action of a drug, Drug Receptors, Dose response relationship, Adverse drug reactions (ADR), Manifestations of ADR, Factors affecting the drug effect. Sedatives, Hypnotics, Antipyretic and analgesic drugs, NSAIDS, Pharmacology of cough, Hypertension and Heart failure.

Unit III: Drugs in git

Digestants, Antiflatulants, Appetite suppressants, Hypolipidaemic agents. Emetics, drug therapy of vomiting, Vertigo and Diarrhea, Pharmacotherapy of constipation.

Unit IV: Dosages Certification

Dosage form consideration in preformulation, solid dosage form, solution formulations, emulsion, suspension, freeze dried products and its regulatory considerations, drug design phase, solubility analysis, dissolution and permeation, characterization scheme, stability tastings, order of reaction, antioxidants, chelating agents, impurity, GMP related to bulk drugs and APIs.

Unit V: Chemotherapy

General principles of chemotherapy of infections, Chemotherapy of UTI, Chemotherapy of Malaria, Chemotherapy of Tuberculosis, Chemotherapy of viral infections, Antiseptics, disinfectants and insecticides.

Department of Chemistry

SYLLABUS

B.Sc. (Honors) CHEMISTRY

(SUBS.)

For

Session

2018-19

2019-20

2020-21

SESSION	***2018-19***
CLASS	***B.Sc. CHEMISTRY (Subs.)***
SEMESTER	***I***
PEPER	***S-I***
TITLE OF THE PAPER	***Botany***
Max.	***70***

Unit – I

Plant Classification & Taxonomy

(A) Concept of Gymnoperm and Angiosperm structure, characters and life cycles, Methods of Plant Breeding – Introduction, Selection and Hybridisation (pedigree, backcross, mass selection, bulk method), Polyploidy, Male sterility and heterosis breeding.

(B) Bryophytes: Occurrence, morphology, classification, anatomy and reproduction.
Pteridophytes: Occurrence, Morphology, Classification, anatomy and reproduction.

Unit – II

Algae – Occurrence, Structure, Classification Reproduction.

Cyanobacteria - Occurrence, Structure, Classification Reproduction.

Fungi – Classification, Occurrence, Structure and Reproduction.

UNIT – III

(A) Morphology, Anatomy and different function of Flowering plants, Root, Stem, Leaves, Flower, Fruit and seeds.

(B) Movement of water, food, Nutrients and exchange of gases, Plant and water, mineral nutrition.

Unit – IV

Photosynthesis: Photochemical reaction, Photophosphorelation, Carbon fixation Pathway; C3, C4 and CAM pathways, Respiration (aerobic, anaerobic, including fermentation), Photorespiration, Nitrogen cycle and Fixation.

Unit – V

Importance of secondary metabolites, Pigments as photoreceptors (plastidial pigments and phytochromes), Plant movements; photoperiodism and flowering, Vernalisation, senescence, Growth substances (Plant Hormones) – their chemical nature and role, Fruit Ripening, Dormancy, Storage and Germination of seeds.

SESSION	***2018-19***
CLASS	***B.Sc. CHEMISTRY (Subs.)***
SEMESTER	***II***
PEPER	***S-II***
TITLE OF THE PAPER	**Cell Biology**
Max.	***70***

Unit – I

Morphology of Cell, Prokaryotic and Eukaryotic Cell Structure, Plant Cell Vs Animal Cell, Structure and Composition of Plant cell wall, Bacterial Cell wall and Plasma Membrane, Transport across the Plasma membrane.

Unit - II

Origin, Structure, Cellular organization and Functions of mitochondria, golgi apparatus, Chloroplast, endoplasmic reticulum, lysosomes, nucleus, ribosome, Chromosome structure and its models.

Unit – III

Cell Cycle, Cell division: Interphase, Mitosis, Meosis and its regulation, Ageing of cell, cell death, cytoskeleton, cell adhesion, cell junctions, cell check point, cell cycle regulation.

Unit – IV

Structural organization and chemical composition of chromosome,s nucleosomes organization, special chromosomes, chromosome staining, Banding pattern in human chromosomes.

Unit – V

Transport by vesicles formation, Endocytosis, Exocytosis, Receptor mediate eno-exo cytosis, Basics of signal transduction, Protein trafficking, Protein sorting, Stem cell biology, Cancer cell biology.

SESSION	***2018-19***
CLASS	***B.Sc. CHEMISTRY (Subs.)***
SEMESTER	***III***
PEPER	***S-III***
TITLE OF THE PAPER	**Molecular Biology**
Max.	***70***

Unit – I

Genetic code: Basic features, Biological significance, various types of genes, Wobble hypothesis. Organization of DNA and RNA in prokaryotes and in eukaryotes, Types of DNA & RNA.

Unit – II

Central dogma, DNA replication in prokaryotes and eukaryotes, conservative, semi conservative and dispersive types, Enzymology of DNA replication. Errors & regulation of DNA replication, DNA repair.

Unit – III

Transcription in Prokaryotes: Mechanism of Transcription (Initiation, Elongation, Termination), RNA polymerases, Promoters, Post transcriptional modification, Inhibitors of transcription.

Unit – IV

Translation: Mechanism of Translation (Initiation, Elongation & Termination), Ribosomes structure, A & P sites, Prokaryotic and Eukaryotic Ribosomes, Release Factors and Nonsense codons, Post translational modifications. Apoptosis.

Unit – V

Regulation of Gene Expression – Concept of operon, promoters, Operator, Repressors, Structural genes, inducers, *Iac* operon, *trp* operon, Attenuation, *ara* operon, positive regulation, negative regulation, cascade regulation.

SESSION	***2018-19***
CLASS	***B.Sc. CHEMISTRY (Subs.)***
SEMESTER	***IV***
PEPER	***S-IV***
TITLE OF THE PAPER	**Enzyme**
Max.	***70***

Unit– I

General Properties of Enzymes, Structural properties of enzymes, Nomenclature and Classification of Enzymes, Protein nature of Enzymes, Non-protein enzymes, Metalloenzymes and metal activated enzymes, turn over no.

Unit – II

Models proposed for Enzymatic Reactions, Factors affecting the rate of enzyme catalyzed reaction. Mechanism of action of enzymes: Lock & Key model, induced fit model, enzyme-substrate model, active site, active site determination.

Unit – III

Acid-base catalysis of enzymes, Covalent catalysis, Metal ion catalysis, Serine Protease, Ribonuclease, Chymotrypsin, Lysozyme, measurement of enzyme activity, Machalis Menten equation, significance of Vmax and Km.

Unit – IV

Enzyme inhibition: Reversible-Irreversible inhibition, Feedback Inhibition, Concept of Coenzymes and Cofactors activity and binding efficiency, Allosteric Inhibition, rate of enzyme action.

Unit – V

Enzyme Biotechnology – Immobilization, immobilization techniques, Uses of enzymes in milk industry, food industry, leather industry, enzymes in cellulose & metal degradation, Designer enzymes, Biosensors, Morden enzyme tools & technology, enzyme extraction and purification.

SESSION	***2018-19***
CLASS	***B.Sc. CHEMISTRY (Subs.)***
SEMESTER	***V***
PEPER	***S-V***
TITLE OF THE PAPER	**Metabolism**
Max.	***70***

Unit – I

Biological Oxidation: Oxidation, Reduction, Enzymes involved in oxidation-reduction, Electron Transport Chain in detail. Basal Metabolic Rate & its affecting factors.

Unit – II

Digestion and absorption of carbohydrates, Concept of Carbohydrate Metabolism, Glycolysis – aerobic & anaerobic Glycolysis, TCA cycle, Glycogen Metabolism.

Unit - III

Digestion, absorption and mobilization of Lipids, Transport of Fatty Acids, Role of Hormones in Digestion and mobilization, Elementary idea of metabolism of Triglycerides, β-oxidation of Fatty acids, Cholesterol, Ketone Bodies.

Unit – IV

Digestion, absorption and mobilization of Proteins and Amino Acids, Oxidation, Reduction, Decarboxylation, deamination and transamination of amino acids, Concept of Glucogenic and Ketogenic amino acids, Nitrogen excretion and Urea cycle.

Unit – V

Heam Metabolism – Source of Bilirubin, Transport of Bilirubin, Conjugation of Bilirubin, Secretion and excretion of Bilirubin, Detoxication, xenobiotices metabolism.

SESSION	***2018-19***
CLASS	***B.Sc. CHEMISTRY (HONS.)***
SEMESTER	***I***
PEPER	***S-1***
TITLE OF THE PAPER	***Matrices, Trigonometry, Calculus, Geometry***
Max.	***120***

Unit I

Linear independence of row and column Matrices, row & column rank of matrix. Equivalence of column and row rank. Eigen values eigen vectors. Characteristic equation of matrix, Cayley Hamilton theorem and its use in finding inverse of matix, application of matrix to a system of linear equation, solving the lineanior equation. Theorem on consistency and inconsistency of a system of linear equations, solving the linear equations with three unknowns.

Unit II

De-Moiver's theorem and its application. Direct and inverse circular and hyperbolic functions, logarithm of a complex quantity, expansion of trigonometrically function.

Unit III

Concept of partial differentiation, Successive differentiation Leibnitz theorem, Maclaurin and Taylor series expansions. Asymptotes. Tracing of curves in Cartesian and Polar Co-ordinates.

Unit IV

Integration of irrational algebtaic and transcendental function, reduction formula definite integral Quadrature, Rectification.

Unit V

General equation of second degree. Tracing of Conics. Polar equation of a conic. Equation of Cone with given base. Generators of cone, Right circular cone.

SESSION	***2018-19***
CLASS	***B.Sc. CHEMISTRY (HONS.)***
SEMESTER	***II***
PEPER	***S-2***
TITLE OF THE PAPER	***Differential Equation, Vector Calculus And Analysis & Elementary***
Max.	***120***

Unit I

Linear equation and equation reducible to the linear form , Exact differential equations. First order higher degree equation for x,y,p Clairaut's form and singular solutions. Geometrical meaning of a differential equation, orthogonal trajectories, Linear differential equations with constant coefficients.

Unit II

Homogeneous Linear ordinary differential equation. Linear differential equatios of second order. Transformation of the equation by changing the dependent and independent variables. Method of variation of parameters , ordinary simultaneous differential equations.

Unit III

Scalar and vector product of three vectors, product of four vectors reciprocal vectors. Vector differentiation. Gradient divergence and curl. Vector integration, Line, Surface and volume integrals.

Unit IV

Definition and basic properties of group ,subgroup,cyclic groups, simple properties. Coset decomposition and related theorems. Lagrange' theorem and Fermat's theorem, Normal subgroup, Quotient groups.

Unit V

Homomorphism and Isomorphism of groups, kernel of homomorphism. Fundamental therem of homomorphism of groups.

SESSION	***2019-20***
CLASS	***B.Sc. CHEMISTRY (HONS.)***
SEMESTER	***III***
PEPER	***S-3***
TITLE OF THE PAPER	***Advanced Calculus and Mechanics***
Max.	***120***

Unit I

Definition of a sequence, theorems on limits of sequences, Bounded and monotonic sequence, Cauchy's convergence criterion series of nonnegative terms, Comparison test Cauchy's integral test, Ratio test, Raabe's test, Logarithmic test De-Morgan and Bertrand's test.

Unit II

Alternating series Leibnitz's theorem, Absolute and conditional convergence, Continuity of function of one variable, sequential continuity, properties of continuous functions, uniform continuity.

Unit II

Chain rule of differentiability, mean value theorems and their geometrical interpretation, Darboux's intermediate, Value theorem for derivatives, Limit and continuity of function of two variables.

Unit IV

Analytical conditions of equilibrium of coplanar forces, virtual work, Catenary.

Unit V

Velocities and Accelerations along radial and transverse direction and along tangential and normal directions, Simple harmonic motion.

SESSION	***2019-20***
CLASS	***B.Sc. CHEMISTRY (HONS.)***
SEMESTER	***IV***
PEPER	***S-4***
TITLE OF THE PAPER	***Partial and Advanced Differential Equation***
Max.	***120***

Unit I

Partial differential equation of the first order, Lagrange's solution, Some special types of equations, Charpit's general methods of solution

Unit II

Partial differential equation of the second and higher order, Classification of linear partial differential equations of second order, Homogeneous and non homogeneous equations with constant coefficient, Partial differential equations reducible to equations with constant coefficient.

Unit III

Calculus of variations-variational problems with fixed boundaries, Euler's equation for functions containing first order derivative and one independent variable, Extremals.

Unit IV

Series solution of differential equations, Power series methods, Bessel's equations, Bessel's function and its properties.

Unit V

Recurrence and generating relations, Legendre's equations, Legendre's function and its properties recurrence and generating relations, Orthgonality of functions, Sturm-liouville problem, Orthgonality of eigen functions, Reality of eigen value.

SESSION	***2020-21***
CLASS	***B.Sc. CHEMISTRY (HONS.)***
SEMESTER	***V***
PEPER	***S-5***
TITLE OF THE PAPER	***Linear Algebra, Real Analysis and Discrete Mathematics***
Max.	***120***

Linear Algebra

Unit I

Definition of Vector Space and example, Vector subspace, Addition of vector space, linear span, linear dependence and independence, Basis, finite dimensional vector space, existence and extension theorem.

Unit II

Dimension of addition of vector space, quotient space and dimension, Isomorphism, Linear transformation and matrix representation, algebra of linear transformation, rank and nullity the theorem.

Real Analysis

Unit II

Riemann integral, Interability of continuous and monotonic functions, The fundamental theorem of integral calculus, Mean value theorems of integral calculus.

Unit IV :

Partial derivation and differentiability of real-valued functions of two variables, Schwarz and Young's theorem, Furiesr series of half and full intervals.

Discrete Mathematics

Unit V

Countability, theory of mathematical induction, inclusion and exclusion.

Paper FC- 1

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Unit-I

1- Lora=rkiqdkjrh ¼dfork½ & t;'kadjizlkn
2- iq"i dh vfHkyk"kk ¼ dfork½ &ek[kuykyprqosZnh
3- okD; lajpukvkSj v'kqf);k¡ ¼ladfyr½
4- o.kZ&fopkj ¼Loj&O;atu] oxhZdj.k] mPPkkj.k LFkku½

Unit-II

1- ueddknjksxk ¼dgkuh½ &izsepan
2- ,d FksjktkHkkst ¼fuca/k½ &MkW- f=HkqouukFk 'kqDy
3- i;kZ;okph] foykse] ,dkFkhZ] vusdkFkhZ ,oa 'kCn;qXe 'kCn ¼ladfyr½
4- fojkefpUg& ¼ladfyr½] laf/k ¼ladfyr½

Unit-III

1- Hkxokucq) ¼fuca/k½ &LokehfoosdkuUn
2- yksdra= ,d /keZgS ¼fuca/k½ &MkW- loZiYYkhjk/kkd`".ku
3- ugha :dh gS unh &ghjkykyckNksfr;k
4- iYYkou

Unit-IV

1- vQlj ¼fuca/k½ & 'kjntks'kh
2- gekjh ¼lkaLd`frd ,drk ¼fuca/k½ &jke/kkjh flag fnudj
3- la{ksi.k ¼ladfyr½
4- lekl ¼ladfyr½

Unit-V

1- uSfrdewY; ifjp; ,oaoxhZdj.k ¼vkys[k½ &MkW- 'kf'kjk;
2- vkpj.k dh lH;rk ¼fuca/k½ &ljnkjiw.kZ flag
3- varKkZuvkSjuSfrd thou ¼ys[k½ &MkW- loZiYYkhjk/kkd`".ku
4- vIlknhiksHko ¼ys[k½ &Lokeh J)kuan

F C - 2
English Language

Unit – I

1. Where the mind is without fear : Rabindranath Tagore
2. The Hero: R.K.Narayan
3. Trust with destiny: Jawaharlal Nehru
4. Indian Weavers:Sarojini Naidu
5. The Portrait of a lady:Khushwant Singh
6. The Solitary Reaper: William Wordsworth

Unit – II

Basic Language Skills: Vocabulary, Synonyms, Antonyms, Word Formation, Prefixes, Suffixes.

Unit – III

Basic Language Skills: Uncountable Nouns, Verbs, Tenses, Adverbs.

Unit – IV

Comprehension/Unseen Passage, Translation of sentences (English to Hindi & Hindi to English).

Unit – V

Composition and Paragraph Writing

F C-3
Entrepreneurship Development

Unit – I

Enterpreneurship Development - Concept and importance, function of enterpriser, Goal determination – problems, challenges and solutions.

Unit – II

Project Proposal -Need and objects, Nature of organization, Production Management, Financial Management, Marketing Management, Consumer Management.

Unit –III

Role of regulatory institutions, Role of development organizations, Self employment oriented schemes, Various growth schemes.

Unit – IV

Financial management of project - Financial institution and their role, Capital estimation and arrangement, Cost and price determination, Accounting management.

Unit – V

Problem of entrepreneurs - Problem relating capital, Problem relating registration, Administration problem and how to overcome from above problems.

F C -04
Environmental Studies

Unit – I Study of Environment & Ecology

(a) Definition and Importance.
(b) Public participation and Public awareness.
(c) Ecology – Introduction.
(d) Ecosystem – Concepts, components, structure & functions, Energy flow, Food chain, Food web, Ecological Pyramids & types.

Unit – II Environmental Pollution and Population

(a) Air, Water, Noise, Heat and Nuclear Pollution, Definition, causes, effects and prevention of pollution.
(b) Population Growth, Disparities between countries.
(c) Population Explosion, Family Welfare Programme.
(d) Environment and human health.
(e) Cleanliness and disposal of domestic waste.

Unit – III Natural Resources, Problems and Conservation

(a) Water Resources
(b) Forest Resources
(c) Land Resources
(d) Food Resources
(e) Energy Resources

Unit – IV Bio-diversity and its protection

(a) Introduction – Genetic species and ecosystem diversity.
(b) Value of Bio-diversity – Consumable use, Productive use, Social, Moral and Aesthetic Values.
(c) India as a nation of mega bio-diversity centre, Bio-diversity at national and local levels.
(d) Threats to Bio-diversity – Loss of Habitat, Poaching of wild life, Man and wild life conflicts.

Unit – V Disaster Management and Environmental Laws

(a) Disaster Management – Flood, Earthquake, Cyclones and Landslides.
(b) Conservation of laws for air and water pollution.
(c) Wildlife Conservation Laws.
(d) Role of information technology in protecting environment and health.

Department of Chemistry
A.P.S. University Rewa (M.P.)

(Academic Session 2018-19)

Class	**–**	**B.Sc.(Honors) Chemistry I & II SEM.**
Subject	**–**	**Chemistry**
Paper	**–**	**Practical**
Max. Marks: 200 (100 + 100)	**–**	**Time: 6 Hours**

Physical Chemistry

(A) Any one Experiment **24 Marks**

(i) Determination of melting point

(ii) Determination of boiling point

(iii) Weighing and preparation of solution

(B) Any one Experiment **24 Marks**

(i) Determination of surface tension /percentage composition of given liquid mixture using surface tension method.

(ii) Determination of viscosity/percentage composition of given liquid mixture using viscosity method.

Inorganic Chemistry **32 + 16 Marks**

(i) Inorganic mixture analysis
(Mixture analysis for two cations and two anions)

(ii) Separation of cations by paper chromatography

Organic Chemistry (Any two) **48 Marks**

(i) Crystallization

(ii) Sublimation

(iii) Detection of elements

(iv) Identification of functional group

Viva-voce **26 Marks**

Record **30 arks**

*Practical examination will be held at the end of II SEM.

Department of Chemistry
A.P.S. University Rewa (M.P.)

(Academic Session 2019-20)

Class	**–**	**B.Sc.(Honors) Chemistry III & IV SEM.**
Subject	**–**	**Chemistry**
Paper	**–**	**Practical**
Max. Marks: 200 (100 + 100)	**–**	**Time: 6 Hours**

Inorganic Chemistry **24 Marks**

(i) Analysis of inorganic mixture containing five radicals with at least on interfering radical

(ii) Determination of acetic acid in commercial vinegar using NaOH **24 Marks**

(iii) Redox titrations

(iv) Estimation of Hardness of water by EDTA.

Physical Chemistry **32 + 16 Marks**

(i) Determination of transition temperature of given substance by thermometric method.

(ii) To determine the enthalpy of neutralization of strong acid, strong base.

(iii) Verification of Beer's – Lambert law.

(iv) To study the phase diagram of two component system by cooling curve method.

Organic Chemistry (Any two) **48 Marks**

(i) Identification of an organic compound through the functional group analysis, determination of melting point and preparation of suitable derivatives.

(ii) Use of paper chromatography/Thin layer chromatography: determination of R_f values, separation and identification of organic compounds.

a. Separation of green leaf pigments (spinach leave may be used)

b. Separation of dyes.

Viva-voce **26 Marks**

Record **30 Marks**

*Practical examination will be held at the end of IV SEM.

Department of Chemistry
A.P.S. University Rewa (M.P.)

(Academic Session 2020-21)

Class – **B.Sc.(Honors) Chemistry V SEM.**

Subject – **Chemistry**
Paper – **Practical**
Max. Marks: 200 (100 + 100) – **Time: 6 Hours**

Inorganic Chemistry

(i) Gravimetric analysis: **24 Marks**
Barium as Barium sulphate, Copper as cuprous-thiocynate.

(ii) Complex compound preparation
a. Potassium chlorochromate(IV)
b. Tetramine copper(II) sulphate monohydrate
c. Hexamminenickel(II)chloride **24 Marks**

(iii) Effluent water analysis, Identification of cations and anions in different samples .

(iv) Water analysis, to determine dissolved oxygen in water sample in ppm.

Physical Chemistry **32 + 16 Marks**

(i) To determine the velocity constant (Specific reaction rate) of hydrolysis of methyl acetate/ethyl acetate catalyzed by hydrogen ions at room temperature.

(ii) Determination of partition coefficient of iodine between carbon tetra chloride and water.

(iii) Job's method

(iv) pH- metric titrations, conductometric titrations.

Organic Chemistry (Any two) **48 Marks**

1. Binary mixture analysis containing two solids:
Separation ,identification and preparation of derivatives
2. Preparation

(i) Acetylation, (ii) Benzolytion (iii) meta dinitro benzene
(iv) Picric acid

Viva-voce **26 Marks**

Record **30 Marks**

*Practical examination will be held at the end of VI SEM.

A.P.S. University Rewa (M.P.)

(Academic Session 2018-19)

Class	**–**	**B.Sc.(Honors) Chemistry I & II SEM.**
Subject	**–**	**Botany /Cell Biology (Subsidiary)**
Paper	**–**	**Practical**
Max. Marks: 200 (100 + 100)	**–**	**Time: 6 Hours**

(A) **Botany:** Any two Experiments **(18 + 17) Marks**

(i) To study the tissue organization in root and shoot apices using permanent slides.
(ii) Morphology and anatomy of the following Hibiscus, Pinus.
(iii) Section cutting of Bryophytes and Pteridophytes.
(iv) Comparative study of mitosis and meiosis cell division in plant cell by using permanent slides.
(v) Systematic study of locally available plants belonging to families prescribed theory practical.
(vi) Demonstration of herbarium techniques.

(B) Cell Biology: Any two Experiments **(18 + 17) Marks**

(i) Identify and comment upon spots.
(ii) Preparation of blood film (Leishmen's stain) prepared slides showing the parasites.
(iii) Study of T.S. and L.S. of different human organs (Prepared slides).
(iv) Comparative examination of mitosis and meiosis in an animal cell by using prepared slides.
(v) Study of living animals – Amoeba, Paramecium, Euglena, Hydra, Starfish, Octopus.
(vi) Demonstration of different developmental stages of embryo of frog by prepared slides.

Viva-voce **14 Marks**
Record **16 Marks**

*Practical examination will be held at the end of II SEM.

SESSION	***2018-19***
CLASS	***B.Sc. BIOCHEMISTRY (HONS.)***
SEMESTER	***I***
PEPER	***H-I***
TITLE OF THE PAPER	**Biochemistry**
Max.	***70***

Unit –I: Carbohydrates

Introduction and Biological importance of carbohydrates, Classification, Isomerism, Physical and Chemical properties of carbohydrates, Concept of Chiral carbon, Stereo isomers, Optical isomers, Mutarotation, D & L forms, Boat and chair forms, Haworth perspective formulas, Disaccharides (Reducing and Non, Polysaccharides (Homopolysaccharides, Heteropolysaccharides & Mucopolysaccharides)

Unit – II: Lipids

Introduction and Biological importance of Lipids, Classification, Simple Lipids- fatty acids (Saturated, Unsaturated, Branched and Cyclic fatty acids), Essential fatty acids, Physical & Chemical properties, Saponification value, Acid Value, Rancidity, Compound lipids, Derived lipids, Cholesterol and other sterols.

Unit – III: Proteins

Introduction and biological importance of proteins. Amino Acids, types, Structures and Physical and Chemical properties, Essential amino acids, acid-Base behavior, Zwitter ion, Isoelectric pH, Colour, reactions of amino acids, Classification of Proteins, Peptide Bond, Primary, secondary, tertiary and Quaternary Structures of Proteins, denaturation, renaturation.

Unit – IV: Nucleic Acids

Introduction and Biological importance of Nucleic Acids, Physical and chemical properties, Structural organization and occurrence in the cell, nucleotides, nucleosides, types of nucleic Acids DNA & RNA, Watson-Crick Model, types and functions of DNA and RNA.

Unit – V: Vitamins

Introduction and Biological importance of Vitamins, Water soluble Vitamins, their occurrence, properties, functions and diseases, Fat soluble Vitamins, their occurrence, properties, functions and diseases.

SESSION	***2018-19***
CLASS	***B.Sc. BIOCHEMISTRY (HONS.)***
SEMESTER	***I***
PEPER	***H-2***
TITLE OF THE PAPER	**Chemistry I**
Max.	***70***

Unit – I

Acid-Base concept, Lewis acids-bases, Bronsted Lowry theory, Hydrogen ion concentration, Ionization, pH, Buffers, Biological buffers, Handerson-Haselbalch equation, Measurement of pH, Water structure, Hydrogen bonding.

Unit – II: Solution

Ideal and non ideal solution, different methods of concentration expression, Rault's Law, Classification of colloids, properties of colloids, Donnan-Membrane equilibrium, Factors affecting Viscosity, Significance of viscosity in Biological system.

Unit – III: Chemical Bond

Types of chemical bond: ionic compounds, covalent bonds, co-ordinate compounds, Shapes of orbital, Valence Bond Theory, Molecular Orbital Theory, VSEPR theory, Structure of different molecules, Bond length, Bond angle and bond energy, Conventional bonds and weak bonds, Hybridization, Types of Hybridization.

Unit-IV: Thermodynamics

Introduction, First law of thermodynamics, Internal energy, Enthalpy, Application. Second law of thermodynamics, Entropy, Gibb's Free energy, Spontaneity of reaction, Third law of thermodynamics.

Unit – V: Basic principles of organic chemistry

Classification of organic compounds based on functional groups, IUPAC nomenclature of organic compounds, Isomerism. Tetravalency of carbon, Shapes of simple molecule.

SESSION	***2018-19***
CLASS	***B.Sc. BIOCHEMISTRY (HONS.)***
SEMESTER	***II***
PEPER	***H-3***
TITLE OF THE PAPER	**Techniques & Instrumentation**
Max.	***70***

Unit – I: Centrifugation:

Principle of Centrifugation, Types of centrifuges, Preparative and Analytical centrifugation, sedimentation coefficient, RCF, Factors affecting RCF, Ultracentrifugation, Applications in biology.

Unit – II: Chromatography

Principle and types of Chromatography, Introduction and applications, Paper chromatography, TLC, Column chromatography, GLC, HPLC, Affinity chromatography, Ion-exchange chromatography, Molecular sieving chromatography,

Unit – III: Electrophoresis

Introduction, Principle and Types of Electrophoresis and factors affecting the rate of electrophoresis, Free and Zonal electrophoresis, Paper electrophoresis, Gel electrophoresis, Immuno-electrophoresis, Iso-electric focusing.

Unit – IV: Spectroscopy

Principle of Spectroscopy, Beer-Lambert's Law, Light absorption and transmission, UV-Visible and Infrared Spectroscopy, Concept of NMR, Mass spectroscopy, X-ray diffraction, Bragg's law, Atomic absorption principle and application.

Unit – V: Radioactivity

Production of Isotopes, Synthesis of labeled compounds, measurement of radioactivity, Methods based upon Gas ionization, Ionization chamber, Proportional counters, Geiger Muller counter, Methods based upon excitation - Liquid Scintillation Counting.

Microscopy: Principle of microscopy, types, compound light phase, contrast florescence microscope, electron microscope and application.

SESSION	***2018-19***
CLASS	***B.Sc. BIOCHEMISTRY (HONS.)***
SEMESTER	***II***
PEPER	***H-4***
TITLE OF THE PAPER	**Chemistry - II**
Max.	***70***

Unit –I: Chemical Kinetics

Rate expression, Order of a reaction, Units of rates and specific rate constants, Order of reaction and effect of concentration, fast reaction, photochemical reaction mechanism, Graphical representation of reaction.

Unit – II

s–block elements: comparative study of ns1 and ns2 blocks, diagonal relationship, salient features of hydrides, salvation and complex formation tendencies.

p-block elements: comparative study of group 13-17 elements, compounds. Basic properties of halogens and inert gas.

d-block elements: transition series and physical properties (stability, oxidation states, magnetic and catalytic).

Unit – III

Electronic effects: Inductive Effect, Mesomeric Effect, resonance effect, Electrometric Effect and Hyper conjugation. Nucleophiles and Electrophiles.

Reaction Intermediates: Carbonium ions, Carbanions, Free radicals and Carbenes Homolytic and heterolytic cleavage.

Unit – IV

Reaction Mechanism: Alcohols (Acylation, dehydration, dehydrogenation, oxidation). Phenols (Acylation, electrophilic aromatic displacement reaction).

Aldehydes and Ketones: Oxidation, Reduction, Aldol condensation, Canizaro reaction). **Carboxylic acid:** Reaction for Amine and Aldehyde formation.

Unit – V

Identification of organic compounds by various methods: Extraction by solvents, Purification of organic compound by crystallization and its types, Sublimation, Distillation and its types, Kjeldahl’s method.

SESSION	***2019-20***
CLASS	***B.Sc. BIOCHEMISTRY (HONS.)***
SEMESTER	***III***
PEPER	***H-5***
TITLE OF THE PAPER	**Physiology**
Max.	***70***

Unit – I: Blood

Composition and functions of Blood, Types of blood cells and their formation, Plasma Proteins: Properties and functions, Coagulation of Blood, Hemoglobin, Transport of oxygen and carbon dioxide.

Unit – II: Digestive System

Physiology of Gastrointestinal Tract (GIT), Saliva, Mouth, Oesophagus, Stomach, Pancreas, Liver, Gall Bladder, Intestine, Digestion and absorption of food.

Unit – III: Excretory System

Physiology and Anatomy of Kidney, Structure of Nephron, Types of Nephron, Mechanism of formation of urine, Urea Cycle, Renal regulation of acids & bases, Counter-current theory.

Unit – IV: Nervous System

Structure, types and functions of Neurons, properties of Nerve fibers, Saltatory conduction, Na-K Pump, Synaptic transmission.

Structure, Types and Functions of Muscles, Structure of a Muscle fiber, Muscle Contraction Theories, Muscle Proteins, Role of Ca^{++} in Muscle contraction.

Unit – V: Hormones

Introduction, Mechanism of action of hormones, Pituitary hormones, Thyroid Hormones, Paratharmone, Pancreatic Hormones, Adrenal Hormones, Gonadial Hormones.

SESSION	***2019-20***
CLASS	***B.Sc. BIOCHEMISTRY (HONS.)***
SEMESTER	***III***
PEPER	***H-6***
TITLE OF THE PAPER	**Molecular Biology**
Max.	***70***

Unit – I

Genetic code: Basic features, biological significance, various types of genes, Wobble hypothesis. Organization of DNA and RNA in prokaryotes - eukaryotes, Types of DNA & RNA.

Unit – II

Central Dogma, DNA replication in prokaryotes and eukaryotes, conservative, semi conservative and dispersive types, Enzymology of DNA replication. Errors & regulation DNA replication, DNA repair.

Unit – III

Transcription in Prokaryotes: Mechanism of Transcription (Initiation, Elongation, Termination), RNA polymerases, Promotors, Post transcriptional modification, Inhibitors of transcription.

Unit – IV

Translation: Mechanism of Translation (Initiation, Elongation & Termination), Ribosomes structure, A & P sites, Prokaryotic and Eukaryotic Ribosomes, Release Factors and Nonsense codons, Post translational modifications. Apoptosis.

Unit – V

Regulation of Gene Expression – Concept of Operon, Promoters, Operator, Repressers, Structural genes, Inducers, *lac* operon, *trp* operon, Attenuation, *ara* operon, Positive Regulation, Negative Regulation, Cascade regulation.

SESSION	***2019-20***
CLASS	***B.Sc. BIOCHEMISTRY (HONS.)***
SEMESTER	***IV***
PEPER	***H-7***
TITLE OF THE PAPER	**Enzymes**
Max.	***70***

Unit– I

General Properties of Enzymes, Structural properties of enzymes, Nomenclature and Classification of Enzymes, Protein nature of Enzymes, Non-protein enzymes, Metalloenzymes and Metal activated enzymes.

Unit – II

Models proposed for Enzymatic Reactions, Factors affecting the rate of enzyme catalyzed reaction. Mechanism of action of enzymes: Lock & Key Model, Induced Fit Model, Enzyme-substrate Model, enzyme activity measurement.

Unit – III

Acid-base catalysis of enzymes, Covalent catalysis, Metal ion catalysis, Serine Protease, Ribonuclease, Chymotrypsin, Lysozyme.

Unit – IV

Enzyme inhibition: Reversible-Irreversible inhibition, Feedback Inhibition, Concept of Coenzymes and Cofactors. Allosteric Inhibition.

Unit – V

Enzyme Biotechnology – Immobilization, Uses of enzymes in milk industry, food industry, leather industry, enzymes in cellulose & metal degradation, Designer enzymes, Biosensors, extraction and purification.

SESSION	***2019-20***
CLASS	***B.Sc. BIOCHEMISTRY (HONS.)***
SEMESTER	***IV***
PEPER	***H-8***
TITLE OF THE PAPER	**Genetic Engineering**
Max.	***70***

Unit – I

Pre-mendelian theories, Law of Dominance, Law of Segregation, Law of Independent Assortment, Codominance, Monohybrid Cross, Dihybrid Cross, Back Cross and Test Cross, Concept of Gene: Allele and multiple allele, Pseudo-alleles.

Unit – II

Linkage and Crossing over, Cytological basis of crossing over, molecular mechanism of crossing over, Two factor and Three factor crosses, Chromosomal Mapping, Recombination, Types and Mechanism of Recombination.

Unit – III

Mutation, Molecular basis of Mutation, Chromosomal Mutation, Types of Mutation, Transition, transversion, Frameshift mutation, Insertion, Deletion, Backward and forward, Spontaneous and Induced Mutation.

Unit – IV

PAGE, PCR, RFLP.

DNA finger printing and foot printing,

Blotting Techniques: Southern, Northern & Western Blotting.

Unit – V

Recombinant DNA technology, Restriction Endonuclease, Cloning and DNA Hybridization, Introduction to Cloning Vectors, hybridoma technique.

SESSION	***2020-21***
CLASS	***B.Sc. BIOCHEMISTRY (HONS.)***
SEMESTER	***V***
PEPER	***H-9***
TITLE OF THE PAPER	**Clinical Biochemistry**
Max.	***70***

Unit – I

Water and Electrolyte Balance and Imbalance, Dehydration, Water Intoxication, Acid-Base Balance and Imbalance, Regulation of acid-base by respiration, Regulation of acid-base by renal.

Unit – II

Functions of Liver, Liver Function Tests, Renal Function Tests: Glomerular Filtration Tests, Tests for Renal Blood Flow, Tests of Tubular functions, Gastric Function Tests, Thyroid Function Tests.

Unit – III

Clinical Significance of Enzyme Assay, Serum Enzymes in Heart Diseases, Serum Enzymes in Liver Diseases, Serum Enzymes in GI Tract Diseases, Serum Enzymes in Muscle Diseases, Serum Enzymes in bone Diseases.

Unit – IV

Blood Sugar, Hypoglycemia & Hyperglycemia, Measurement of Blood sugar, Maintenance of Normal Blood Glucose, Introduction to Diabetes Mellitus, Ketone Bodies, Fatty Liver & Obesity, Jaundice, faileria, stone diseases.

Unit – V

Biochemistry of Cancer cells, Carcinogenesis, Properties of cancer of cells, Biochemistry of Metastasis, Oncogenic Markers & Tumour Markers, Etiology of Cancer.

SESSION	***2020-21***
CLASS	***B.Sc. BIOCHEMISTRY (HONS.)***
SEMESTER	***V***
PEPER	***H-10***
TITLE OF THE PAPER	**Metabolism**
Max.	***70***

Unit – I

Biological Oxidation: Oxidation, Reduction, Enzymes involved in oxidation-reduction, Electron Transport Chain in detail. Basal Metabolic Rate & its affecting factors.

Unit – II

Digestion and absorption of carbohydrates, Concept of Carbohydrate Metabolism, Glycolysis – aerobic & anaerobic Glycolysis, TCA cycle, Glycogen Metabolism.

Unit - III

Digestion, absorption and mobilization of Lipids, Transport of Fatty Acids, Role of Hormones in Digestion and mobilization, Elementary idea of metabolism of Triglycerides, β-oxidation of Fatty acids, Cholesterol, Ketone Bodies.

Unit – IV

Digestion, absorption and mobilization of Proteins and Amino Acids, Oxidation, Reduction, Decarboxylation, deamination and transamination of amino acids, Concept of Glucogenic and Ketogenic amino acids, Nitrogen excretion and Urea cycle.

Unit – V

Haem Metabolism – Source of Bilirubin,. Transport of Bilirubin, Conjugation of Bilirubin, Secretion and excretion of Bilirubin. Detoxication.

SESSION	***2020-21***
CLASS	***B.Sc. BIOCHEMISTRY (HONS.)***
SEMESTER	***V***
PEPER	***H-11***
TITLE OF THE PAPER	**Industrial Biochemistry**
Max.	***70***

Unit – I: Fermentation technology

Industrial fermentation, Production of ethyl alcohol, Fermentative production of Organic acids - citric acid, lactic acid, acetic acid, Enzymes - amylase, proteases, streptokinase, Amino acids - glutamic acid, lysine and Vitamins. Industrial production of SCP, Biocontrol agents.

Unit – II: Sugar Industry

Introduction, Manufacture of cane sugar, Extraction and purification of juice, quality measurement, defection, sulphitation and carbonation, concentration or evaporation, crystallization, recovery of sugar from molasses, Manufacture of sucrose from beet root and testing of sugar.

Unit – III: Fats, Oils and Detergents

Natural fats, edible and industrial oils of vegetable origin, common fatty acids, glycerides, purification of oils and refineries, halogenations of unsaturated oils, saponification value, iodine value, acid value, soaps and synthetic detergents.

Unit – IV: Paper and pulp technology

Introduction, Types of pulping, manufacturing of pulp, sulphate or craft pulp, soda pulp, sulphite pulp, rag pulp, beating, refining, filling, sizing and colouring. Peroxide bleaching and its chemistry, resin synthesis, Importance of bleaching, Manufacture of paper, calendaring and uses, Paper industry in India.

Unit – V: Safety and Quality Control

Biological Standardization**:** Principles, Scope & limitations of Bioassays. US-FDA & ICH guideline for quality measurement, Good Clinical Practices, Regulatory aspects of bioavailability, Concept of industrial process and product validation, NABL and NABH accreditation.

SESSION	***2020-21***
CLASS	***B.Sc. BIOCHEMISTRY (HONS.)***
SEMESTER	***VI***
PEPER	***H-12***
TITLE OF THE PAPER	**Pharmaceutical Chemistry**
Max.	***70***

Unit – I: General Pharmacology

Nature and sources of drugs, Routes of drug administration and Dosage forms, Absorption and Bioavailability of drugs, Factors affecting drug absorption, Distribution of drugs, Fate of drugs. Pharmacokinetic models, Application of Pharmacokinetics in new drug development and designing, drug delivery systems

Unit – II

Dosage form consideration in preformulation, solid dosage form, solution formulations, emulsion, suspension, freeze dried products and its regulatory considerations, drug design phase, solubility analysis, dissolution and permeation, characterization scheme, stability tastings, order of reaction, antioxidants, chelating agents, impurity, GMP related to bulk drugs and APIs, Quality control of drug.

Unit – III

Mechanism of action of a drug, Drug Receptors, Dose response relationship, Adverse drug reactions (ADR), Manifestations of ADR, Factors affecting the drug effect.

Unit – IV

Drugs in GIT: Digestants, Antiflatulants, Appetite suppressants, Hypolipidaemic agents. Emetics, drug therapy of vomiting, Vertigo and Diarrhea, Pharmacotherapy of constipation. Sedatives, Hypnotics, Antipyretic and analgesic drugs, NSAIDS, Pharmacology of cough, Hypertension and Heart failure.

Unit – V: Chemotherapy

General principles of chemotherapy of infections, Chemotherapy of UTI, Chemotherapy of Malaria, Chemotherapy of Tuberculosis, Chemotherapy of viral infections, Antiseptics, disinfectants and insecticides.

SESSION	***2020-21***
CLASS	***B.Sc. BIOCHEMISTRY (HONS.)***
SEMESTER	***VI***
PEPER	***H-13***
TITLE OF THE PAPER	**Food & Nutrition**
Max.	***70***

Unit – I

Concept of food and Nutriotion, Balanced Diet, Daily, Recommended Diet for adults, women and children, Nutritional aspects of carbohydrates, fats and proteins, Daily Requirement of Vitamins and Minerals.

Unit – II

Energy Measurement, Calorific Value of Food, Respiratory Quotient, SDA & BMR Factors affecting SDA. Preparation of diet chart, WHO diet recommendation

Unit – III

Diet in Pregnancy & Lactation, Diet in Diabetes Mellitus, Diet in Fevers and Infections, Diet in G.I. Disorders (Diarrhoea, constipation, peptic ulcer)

Unit- IV

Protein Energy Malnutrition, Causes of Malnutrition in India, Community nutrition, Malnutrition and infection, Obesity, Weaning foods, Importance of correct and timely weaning

Unit- V

Planning and preparation of diet in hypertension, in kedney failure, in various diseases. Preparation of low cost recipes, cost concept and cost control, Concept of food supplement, probiotics and organic food.

SESSION	***2018-19***
CLASS	***B.Sc. BIOCHEMISTRY (Subs.)***
SEMESTER	***I***
PEPER	***S-I***
TITLE OF THE PAPER	***Botany***
Max.	***70***

Unit – I: Plant Classification & Taxonomy

(A). Concept of Gymnosperm and Angiosperm, Methods of Plant Breeding- Introduction, Selection and Hybridization (pedigree, backcross, mass selection, bulk method).

(B). **Bryophytes and Pteridophytes** Occurrence, morphology, classification, anatomy and reproduction.

Unit – II

Algae: Occurrence, Structure, Classification and Reproduction.

Cyanobacteria: Occurrence, Structure, Classification and Reproduction.

Fungi: Classification, Occurrence, Structure and Reproduction.

UNIT – III

(A). Morphology, Anatomy and different function of Flowering plants, Root, Stem, Leaves, Flower, Fruit and seeds.

(B). Movement of water, food, Nutrients and exchange of gases, Plant and water, mineral nutrition.

Unit – IV: Photosynthesis

Photochemical reaction, Photophosphorylation, Carbon fixation Pathway; C3, C4 pathway, Respiration (aerobic, anaerobic), Photorespiration, Nitrogen cycle and Fixation.

Unit – V

Importance of secondary metabolites, Pigments as photoreceptors, Plant movements; photoperiodism and flowering, Vernalisation, senescence, Growth substances (Plant Hormones), their chemical nature and role, Fruit Ripening, Dormancy, Storage and Germination of seeds.

SESSION	***2018-19***
CLASS	***B.Sc. BIOCHEMISTRY (Subs.)***
SEMESTER	***II***
PEPER	***S-2***
TITLE OF THE PAPER	**Zoology**
Max.	***70***

Unit – I: Invertebrates

General characteristics and outline classification of non-chordates according to Parker and Haswell (revised by Marshall and Williams). Type Studies: Protozoa (Paramaecium), Porifera (Sycon), Coelentrata (Obelia), Helminthes (Liver Fluke), Annelida (Earthworm), Arthropoda (Prawn), Mollusca (Pila) and Echinodermata (Star Fish).

Unit – II: Chordata

General characteristics and outline classification of Chordates according to Parker and Haswell (revised by Marshall and Williams). Type Studies: Hemichordata (Balanglosus), Urochordata (Herdmania), Cephalochordata (Amphioxus), Pisces (Scoliodon), Amphibia (Frog), Reptilia (Uromastix), Aves (Pigeon) and Mammalia (Rabbit).

Unit – III: Developmental biology & Evolution

Gametogenesis: Spermatogenesis and oogenesis, Placentation in mammals, Fertilization, Types of eggs, Patterns of Cleavage, Blastulation and gastrulation in Frog and Chick up to formation of germinal layers., Fate Maps, Organizer concept.

Unit – IV: Origin of life

Theories of Evolution (Lamarckism, Darwin and Neo Darwin). Population concept: Characteristics of population, Population growth and factors affecting population, population control.

Unit – V: Animal behaviour & Applied zoology

General introduction to Ethology, Innate and Learned behavior (Instinct, Imprinting and motivation), Social Behaviour (Insect and Primates), Neural and Hormonal control of behaviour. Biological Clocks (Circadian and Circanual Rhythm), Communication, Perception of environment (Audio and Visual). Aquaculture (Prawn & Fish), Lac culture, Sericulture, Apiculture.

SESSION	***2019-20***
CLASS	***B.Sc. BIOCHEMISTRY (Subs.)***
SEMESTER	***III***
PEPER	***S-3***
TITLE OF THE PAPER	**Cell Biology**
Max.	***70***

Unit – I

Morphology of Cell, Prokaryotic and Eukaryotic Cell, Plant Cell Vs Animal Cell, Structure and Composition of Plant cell wall, Bacterial Cell wall and Plasma Membrane, Transport across the Plasma membrane.

Unit - II

Origin, Structure, Cellular organization and functions of mitochondria, golgi apparatus, Chloroplast, endoplasmic reticulum, lysosomes, nucleus, ribosomes.

Unit - III

Cell Cycle, Cell division: Interphase, Mitosis, Meosis and its regulation, Ageing of cell, Cell death, Cytoskeleton, Cell adhesion, Cell junctions.

Unit – IV

Structural organization and chemical composition of chromosomes - nucleosomes organization, special chromosomes, Chromosome staining, Banding pattern in human chromosomes.

Unit – V

Endocytosis, Exocytosis, Receptors basics of signal transduction, Protein trafficking, Protein sorting, Stem cell biology, Cancer cell biology.

SESSION	***2019-20***
CLASS	***B.Sc. BIOCHEMISTRY (Subs.)***
SEMESTER	***IV***
PEPER	***S-4***
TITLE OF THE PAPER	**Microbiology**
Max.	***70***

Unit – I

Introduction to Microorganisms, Classification of Bacteria, Occurrence, Morphology, Locomotion and Structural organization, Gram +ve and –ve bacteria, Reproduction in bacteria.

Unit – II

Introduction to Viruses, Classification, Occurrence, Morphology, Structural organization, Reproduction in virus, Reverse Transcription, Transformation, Transduction, life cycle of virus.

Unit – III: Culture Media

Introduction, types of culture media, Nutritive Media, Growth of Bacteria, minimal media, pure culture, methods of isolation, maintenance and preservation of Pure culture, factor affecting growth, growth cycle .

Unit – IV: Microorganisms and Industry

Industrial uses of Bacteria and Yeasts, Bioengineering, and Bioprocessing: Food spoilage and preservation, Food born infection and diseases, Disposal of domestic and industrial wastes, Biochemistry of active compounds of microorganism.

Unit – V

Immobilization of microbes, Types of immobilization, Applications in Microbiology and Biochemistry, Fermentation Technology.

Microbial Pathology: mechanism of microbial pathogenesity, pathology of common microbial disease and currently therapy, Common microbial infection and treatment.

SESSION	***2020-21***
CLASS	***B.Sc. BIOCHEMISTRY (Subs.)***
SEMESTER	***V***
PEPER	***S-5***
TITLE OF THE PAPER	**Immunology**
Max.	***70***

Unit – I

Types of Immunity, Innate, Acquired Immunity, Passive and active Immunity, Cellular and Humoral Immunity. Cells and organs involved in Immune response.

Unit – II: Specificity & activation of immune system

T and B lymphocyte classes. Major histocompatibility complex I and II. Humoral immune response and its regulation. Cell mediated immunity-cytolytic and natural killer T lymphocytes. Activation of B lymphocytes.

Unit – III: Immunoglobulins

Properties, Structure, types and function of immunoglobulins, B-cell Receptors, Epitopes, Antigenic determinants on immunoglobulins.

Unit - IV

Allergy and allergens, autoimmune disorders, Immunodeficiency diseases, Vaccines, types of vaccines, Immune response in various infectious diseases, Immunity in AIDS and Cancer.

Unit - V

Antigen-antibody interactions, Precipitation, Agglutination, Cross reactivity, Concept of Radioimmunoassay, Enzyme-linked immunosorbent assay, Western Blotting, Immunoflorescence.

Paper FC- 1

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Unit-I

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2- iq"i dh vfHkyk"kk ¼ dfork½ &ek[kuykyprqosZnh
3- okD; lajpukvkSj v'kqf);k¡ ¼ladfyr½
4- o.kZ&fopkj ¼Loj&O;atu] oxhZdj.k] mPPkkj.k LFkku½

Unit-II

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2- ,d FksjktkHkkst ¼fuca/k½ &MkW- f=HkqouukFk 'kqDy
3- i;kZ;okph] foykse] ,dkFkhZ] vusdkFkhZ ,oa 'kCn;qXe 'kCn ¼ladfyr½
4- fojkefpUg& ¼ladfyr½] laf/k ¼ladfyr½

Unit-III

1- Hkxokucq) ¼fuca/k½ &LokehfoosdkuUn
2- yksdra= ,d /keZgS ¼fuca/k½ &MkW- loZiYYkhjk/kkd`".ku
3- ugha :dh gS unh &ghjkykyckNksfr;k
4- iYYkou

Unit-IV

1- vQlj ¼fuca/k½ & 'kjntks'kh
2- gekjh ¼lkaLd`frd ,drk ¼fuca/k½ &jke/kkjh flag fnudj
3- la{ksi.k ¼ladfyr½
4- lekl ¼ladfyr½

Unit-V

1- uSfrdewY; ifjp; ,oaoxhZdj.k ¼vkys[k½ &MkW- 'kf'kjk;
2- vkpj.k dh lH;rk ¼fuca/k½ &ljnkjiw.kZ flag
3- varKkZuvkSjuSfrd thou ¼ys[k½ &MkW- loZiYYkhjk/kkd`".ku
4- vIIknhiksHko ¼ys[k½ &Lokeh J)kuan

F C - 2
English Language

Unit – I

1. Where the mind is without fear : Rabindranath Tagore
2. The Hero: R.K.Narayan
3. Trust with destiny: Jawaharlal Nehru
4. Indian Weavers:Sarojini Naidu
5. The Portrait of a lady:Khushwant Singh
6. The Solitary Reaper: William Wordsworth

Unit – II

Basic Language Skills: Vocabulary, Synonyms, Antonyms, Word Formation, Prefixes, Suffixes.

Unit – III

Basic Language Skills: Uncountable Nouns, Verbs, Tenses, Adverbs.

Unit – IV

Comprehension/Unseen Passage, Translation of sentences (English to Hindi & Hindi to English).

Unit – V

Composition and Paragraph Writing

F C-3
Entrepreneurship Development

Unit – I

Enterpreneurship Development - Concept and importance, function of enterpriser, Goal determination – problems, challenges and solutions.

Unit – II

Project Proposal -Need and objects, Nature of organization, Production Management, Financial Management, Marketing Management, Consumer Management.

Unit –III

Role of regulatory institutions, Role of development organizations, Self employment oriented schemes, Various growth schemes.

Unit – IV

Financial management of project - Financial institution and their role, Capital estimation and arrangement, Cost and price determination, Accounting management.

Unit – V

Problem of entrepreneurs - Problem relating capital, Problem relating registration, Administration problem and how to overcome from above problems.

F C -04
Environmental Studies

Unit – I Study of Environment & Ecology

(a) Definition and Importance.
(b) Public participation and Public awareness.
(c) Ecology – Introduction.
(d) Ecosystem – Concepts, components, structure & functions, Energy flow, Food chain, Food web, Ecological Pyramids & types.

Unit – II Environmental Pollution and Population

(a) Air, Water, Noise, Heat and Nuclear Pollution, Definition, causes, effects and prevention of pollution.
(b) Population Growth, Disparities between countries.
(c) Population Explosion, Family Welfare Programme.
(d) Environment and human health.
(e) Cleanliness and disposal of domestic waste.

Unit – III Natural Resources, Problems and Conservation

(a) Water Resources
(b) Forest Resources
(c) Land Resources
(d) Food Resources
(e) Energy Resources

Unit – IV Bio-diversity and its protection

(a) Introduction – Genetic species and ecosystem diversity.
(b) Value of Bio-diversity – Consumable use, Productive use, Social, Moral and Aesthetic Values.
(c) India as a nation of mega bio-diversity centre, Bio-diversity at national and local levels.
(d) Threats to Bio-diversity – Loss of Habitat, Poaching of wild life, Man and wild life conflicts.

Unit – V Disaster Management and Environmental Laws

(a) Disaster Management – Flood, Earthquake, Cyclones and Landslides.

(b) Conservation of laws for air and water pollution.
(c) Wildlife Conservation Laws.
(d) Role of information technology in protecting environment and health.

Department of Chemistry
A.P.S. University Rewa (M.P.)

(Academic Session 2018-19)

Class	**–**	**B.Sc.(Honors) Biochemistry I & II SEM.**
Subject	**–**	**Chemistry**
Paper	**–**	**Practical**
Max. Marks: 200 (100 + 100)	**–**	**Time: 6 Hours**

Physical Chemistry

(A) Any one Experiment **24 Marks**

(i) Determination of melting point
(ii) Determination of boiling point
(iii) Weighing and preparation of solution

(B) Any one Experiment **24 Marks**

(i) Determination of surface tension /percentage composition of given liquid mixture using surface tension method.
(ii) Determination of viscosity/percentage composition of given liquid mixture using viscosity method.

Inorganic Chemistry **32 + 16 Marks**

(i) Inorganic mixture analysis
(Mixture analysis for two cations and two anions)
(ii) Separation of cations by paper chromatography

Organic Chemistry (Any two) **48 Marks**

(i) Crystallization
(ii) Sublimation
(iii) Detection of elements
(iv) Identification of functional group

Viva-voce **26 Marks**

Record **30 Marks**

*Practical examination will be held at the end of II SEM.

Department of Chemistry
A.P.S. University Rewa (M.P.)

(Academic Session 2018-19)

Class	**–**	**B.Sc.(Honors) Biochemistry I & II SEM.**
Subject	**–**	**Botany /Zoology (Subsidiary)**
Paper	**–**	**Practical**
Max. Marks: 200 (100 + 100)	**–**	**Time: 6 Hours**

(A) **Botany:** Any two Experiments **(18 + 17) Marks**

(i) To study the tissue organization in root and shoot apices using permanent slides.
(ii) Morphology and anatomy of the following Hibiscus, Pinus.
(iii) Section cutting of Bryophytes and Pteridophytes.
(iv) Comparative study of mitosis and meiosis cell division in plant cell by using permanent slides.
(v) Systematic study of locally available plants belonging to families prescribed theory practical.
(vi) Demonstration of herbarium techniques.

(B) Zoology: Any two Experiments **(18 + 17) Marks**

(i) Identify and comment upon spots.
(ii) Preparation of blood film (Leishmen's stain) prepared slides showing the parasites.
(iii) Study of T.S. and L.S. of different human organs (Prepared slides).
(iv) Comparative examination of mitosis and meiosis in an animal cell by using prepared slides.
(v) Study of living animals – Amoeba, Paramecium, Euglena, Hydra, Starfish, Octopus.
(vi) Demonstration of different developmental stages of embryo of frog by prepared slides.

Viva-voce **14 Marks**
Record **16 Marks**

*Practical examination will be held at the end of II SEM.

DEPARTMENT OF CHEMISTRY

COURSE STRUCTURE

for

M.Sc. (Chemistry)
Four Semesters (Two Year)

Programme

Based on

Choice Based Credit System (CBCS)
(As per Ordinanc-14)

I & II Semester 2020-21
III & IV Semester 2021-22

AWADHESH PRATAP SINGH UNIVERSITY, REWA (M.P.)

Semester Course of M.Sc. Chemistry

Programme	**:**	**M.Sc. Chemistry**
Programme Code	**:**	**13**
Duration	**:**	**4 Semester (Two Year)**

Chemistry Program Goals

1. To provide specific knowledge in chemistry that stresses scientific reasoning and analytical problem solving with a molecular perspective.
2. To provide students with the skills required to succeed, the chemical industry research and professional.
3. To expose the students to a breadth of experimental techniques using modern instrumentation.

Learning Objectives

1. Student will learn the broad knowledge of different field of chemistry.
2. The student will understand the advance knowledge of spectroscopy, thermodynamic principles, nature of chemical reactions and energy related problems.
3. The student will understand the interdisciplinary nature of chemistry and to integrate knowledge of mathematics, physics and other disciplines to a wide variety of chemical problems for industries and quality control.
4. The student will learn the laboratory skills needed to design, safely conduct and interpret chemical research.
5. The student will acquire a foundation of chemistry of sufficient breadth and depth to enable them to understand and critically interpret the advance chemical literature.
6. The student will develop the ability to effectively communicate scientific information and research results in written and oral formats.
7. The student will learn professionalism, including the ability to work in teams and apply basic ethical principles in life and profession. He/She will understand how to interpret the results and apply them in solving the problems.

PROGRAM OUTCOME (PO)

The following outcome reflects the terminal skills that all Master Post Graduates should be able to demonstrate program completion.

PO1: The chemistry course is designed to give core knowledge with the skills to critically assess and solve problems, related to chemical science.

PO2: The different papers sub-discipline such as organic, inorganic, physical and analytical chemistry give detail knowledge and applications in respective specialization.

PO3: The Masters students will have working knowledge of chemical instrumentation and laboratory techniques.

PO4: The training will the help students to design and conduct independent work in industry or academia.

PROGRAM SPECIFIC OUTCOME (PSO)

PSO1

- Understanding of fundamental and advanced concepts of Quantum Chemistry and coordination chemistry.
- Knowledge of fundamentals of inorganic spectroscopy, their interpretation and their applications.
- Study of various chemical reagents and their role in inorganic synthesis and inorganic analysis.

PSO2

- Basic knowledge of Organic chemistry
- Study of various reaction intermediates and reaction pathways.
- Understanding of various organic reactions, rearrangement, cross-coupling reactions and applications.

PSO3

- Basic understanding of basic area of physical chemistry.
- Knowledge of various theories of physical chemistry such as thermodynamics, electrochemistry and properties of solutions.
- Applications of physical chemistry in various fields.

PSO4

- Basic understanding of analytical chemistry.
- Knowledge of volumetric methods of analysis and gravimetric analysis.
- Study of spectro-analytical techniques and their applications to various chemical systems.

Eligibility: B.Sc. with Mathematics and Biology as a subject.

Age Limit: No age limit.

Admission Procedure: The admission will be done as per merit of qualifying examinations.

Vision of the University

To be the premier institution that offers teaching and learning programmes of the best quality, graduate students who excel and become leaders in the chosen profession contributing to the community, the nation and the world, and prepares individuals of the highest moral fibre. The vision of university is:

To create an ideal society and an intellectual environment that initiates, nourishes and perpetuates values of co-existence and to fulfill and achieve excellence. The university, under the dynamic leadership of our honourable Vice-chancellor is working on quite a few ambitious plans. The idea is to develop the university as a knowledge city.

M.Sc. CHEMISTRY
(FOUR SEMESTER COURSE)

SCHEME OF EXAMINATION
(CBCS Syllabus)
(Effective from 2020-21)

SEMESTER –I

Paper	Course No.	Course	Credit	Marks
Paper I	MCH-401	Inorganic Chemistry I	**4**	**100(60+40)**
Paper II	MCH-402	Organic Chemistry I	**4**	**100(60+40)**
Paper III	MCH-403	Physical Chemistry I	**4**	**100(60+40)**
Generic Elective				
Paper IV	MCH-404	(a) Mathematics for Chemists[1] (b) Biology for Chemists[2]	**4**	**100(60+40)**
Practical	Inorganic + Organic + Physical (2+2+2)		**6**	**50+50+50**
		Comprehensive viva voce	**4***	**100**
Total Marks			**26**	**650**

*Virtual Credit
[1] Strictly for the students without Mathematics in B.Sc.
[2] Strictly for the students without Biology in B.Sc.

SEMESTER –II

Paper	Course No.	Course	Credit	Marks
Paper V	MCH-405	Inorganic Chemistry II	**4**	**100(60+40)**
Paper VI	MCH-406	Organic Chemistry II	**4**	**100(60+40)**
Paper VII	MCH-407	Physical Chemistry II	**4**	**100(60+40)**
Generic Elective				
Paper VIII	MCH-408	Spectroscopy and Diffraction Methods	**4**	**100(60+40)**
Practical	Inorganic + Organic + Physical (2+2+2)		**6**	**50+50+50**
		Comprehensive viva voce	**4***	**100**
Total Marks			**26**	**650**

*Virtual Credit

SEMESTER– III

Paper	Course No.	Course	Credit	Marks
Paper–I	MCH-501	Application of Spectroscopy	**4**	**100(60+40)**
Paper–II	MCH-502	Photochemistry	**4**	**100(60+40)**
Discipline Elective (any one)				
Paper–III	MCH-503 MCH-504 MCH-505	Analytical Chemistry Heterocyclic Chemistry Electrochemistry	**4**	**100(60+40)**
Generic Elective (any one)				
Paper–IV	MCH-506 MCH-507	Industrial Chemistry Medicinal Chemistry	**4**	**100(60+40)**
Practical		Inorganic + Organic + Physical (2+2+2)	**6**	**50+50+50**
		Comprehensive viva voce	**4***	**100**
Total Marks			**26**	**650**

***Virtual Credit**

SEMESTER– IV

Paper	Course No.	Course	Credit	Marks
Paper V	MCH-508	Organotransition Metal Chemistry	**4**	**100(60+40)**
Paper VI	MCH-509	Solid State Chemistry	**4**	**100(60+40)**
Discipline Elective (any one)				
Paper VII	MCH-510 MCH-511 MCH-512	Natural Product Organic synthesis Polymer Chemistry	**4**	**100(60+40)**
Generic Elective (any one)				
Paper VIII	MCH-513 MCH-514	Environmental Chemistry Computer-Aided Drug Discovery	**4**	**100(60+40)**
Practical		Inorganic + Organic + Physical (2+2+2)	**6**	**50+50+50**
		Comprehensive viva voce	**4***	**100**
Total Marks			**26**	**650**

***Virtual Credit**

Grand Total Marks M.Sc. (Ist to IVth Sem) = **2600**

SEMESTER –I
Paper-I
MCH-401: INORGANIC CHEMISTRY-I

COURSE OBJECTIVES

To make the student conversant with

- The basic concept of Molecular Symmetry and Group Theory
- Stereochemistry and bonding in main group compounds
- Metal ligand equilibrium in solution
- Reaction mechanism of transition metal complexes
- Metal ligand bonding

Unit-I

Molecular Symmetry and Group Theory

Symmetry elements and symmetry operations, definition of group, subgroup and classes in a group. Conjugacy relation and classes. Point symmetry group. Schonfilies symbols, representations of groups by matrices (representation for the C_n, C_{nv}, C_{nh}, D_{nh} group to be worked out explicity). Character of a representation. The great orthogonality theorem (without proof) and its importance. Character tables and their use. Reducible representations and their reduction spectroscopy. Derivation of character table for C_{2v} and C_{3v} point group Symmetry aspects of molecular vibrations of H_2O molecule.

Unit-II

Stereochemistry and Bonding in Main Group Compounds

VSEPR, Walsh diagram (triatomic and penta-atomic molecules), dπ-pπ bond, Bent rule and Short comings of VSEPR model, energetics of hybridization, some simple reactions of covalently bonded molecules.

Unit-III

Metal-Ligand Equilibrium in Solution

Stepwise and overall formation constants and their interaction, trends in stepwise constant, factors affecting the stability of metal complexes with reference to the nature of metal ion and ligand. Chelate effect and its thermodynamic origin, determination of binary formation constants by potentiometry and spectrophotometry.

Unit-IV

Reaction Mechanism of Transition Metal Complexes

Energy profile of a reaction, reactivity of metal complex, inert and labile complexes, kinetic application of valence bond and crystal field theories, kinetics of octahedral substitution, acid hydrolysis, factors affecting acid hydrolysis, base hydrolysis, conjugate base mechanism, direct and indirect evidences in favour of conjugate mechanism, anion reactions, reactions without metal ligand bond cleavage. Substitution reactions in square planar complexes, the trans effect, mechanism of the substitution reaction. Redox reaction, electron transfer reactions, mechanism of one electron transfer reactions, outer sphere type reactions, cross reactions and Marcus-Hush theory, inner sphere type reactions.

Unit-V

Metal-Ligand bonding

Limitation of crystal field theory, molecular orbital theory for bonding in octahedral, tetrahedral and square planar complexes, π-bonding and molecular orbital theory. John-Teller effect, Electronic spectra and transition metal complexes, spectroscopic term and microstates for the p^2 and d^2 configurations.

Books Suggested

1. Advanced Inorganic Chemistry, F.A. Cotton and Wilkinson, John Wiley.
2. Inorganic Chemistry, J.E. Huhey, Harpes & Row.
3. Chemistry of the Elements. N.N. Greenwood and A. Earnshow, Pergamon.
4. Inorganic Electronic Spectroscopy, A.B.P. Lever, Elsevier.
5. Magnetiochemistry, R.L. Carlin, Springer Verlag.
6. Comprehensive Coordiantion Chemistry eds., G. Wilkinson, R.D. Gillars and J.A. Mc Cleverty,Pergamon.

7. J.E. House, Inorganic Chemistry, Elsevier, 2008.
8. D.K. Sriver, P.W. Alkins and C.H. Langford, Inorganic Chemistry, Oxford University, Pra 51, Oxford, 1994.

COURSE OUTCOMES

The students will be able to

- know the Symmetry elements and symmetry operations covers a wide area of research in theoretical chemistry.
- know the shape of the molecules and their point groups
- Demonstrate and understanding of VSEPR theory
- evaluate the stability of metal ligand complexes
- Get knowledge about reaction mechanism and metal ligand bonding

SEMESTER–I
Paper-II
MCH-402: ORGANIC CHEMISTRY-I

COURSE OBJECTIVES

To make the student learn about the

- Concepts of aromaticity
- The basic concepts in stereochemistry
- To understand principles of organic reaction mechanism, substitution, elimination, homo- and hetero bond addition reactions.

Unit-I

Nature and Bonding in Organic Molecules

Delocalized chemical bonding-conjugation, cross conjugation, resonance hyperconjugation, bonding in fullerences, tautomerism. Aromaticity in benzenoid and non-benzoid compounds, alternate and non-alternate hydrocarbons. Huckel's rule, energy. Level of π-molecular orbitals, annulenes, anti-aromaticity, homo-aromaticity, PMO approach. Bonds weaker than covalent-addition compounds, crown ether complexs and cryptands, inclusion compounds, catenanes and rotaxanes.

Unit-II

Stereochemistry

Strain due to unavoidable crowding Elements of symmetry, chirality, molecules with more than one chiral center, threo and ertythro isomers, methods of resolution, optical purity, enantiotopic and diastereotopic atoms, groups and faces, stereospecific and stereoselective synthesis, Asymmetric synthesis. Optical activity in the absence of chiral carbon (biphenyls, allenes and spirane chirallity due to helical shape. Stereochemistry of the compounds containing nitrogen, sulphur and phosphorus.

Unit-III

Conformational analysis and linear free energy relationship

Conformational analysis of cycloalkanes, decalines, effect of conformation on reactivity, conformation of sugars. Generation, structure, stability and reactivity of carbocations, carbanions, free radicals, carbenes and nitrenes. The Hammett equation and linear free energy relationship, substituents and reaction constants, Taft equation.

Unit-IV

Reaction Mechanism : Structure and Reactivity

Type of mechanisms, types of reactions, thermodynamic and kinetic requirements, kinetic and thermodynamic control, Hammond's postulate, Curtir-Hammett principle. Potential energy diagrams, transition states and intermediates, methods of determining mechanisms, isotopes effects.

Unit-V

Aliphatic Nucleophilic Substitution

The S_N2, S_N1 mixed S_N1 and S_N2 and SET mechanism. The neighboring group mechanism, neighboring group participation by p and s bonds, anchimeric assistance. Classical and nonclassical carbocations, phenomium ions, norborynl systems, common carbocation rearrangements. Application of NMR spectroscopy in the detection of carbocations. The SN1 mechanism. Nucleophilic substitution at an allylic, aliphatic trigonal and a vinylic carbon. Reactivity effects of substrate structure, attacking nucleophile, leaving group and reaction medium, phase transfer catalysis and ultrasound, ambident nucleophile, regioselectivity.

Books Suggested

1. Advanced Organic Chemistry-Reactions, Mechanism and Structure, Jerry March, John Wiley.
2. Advanced Organic Chemistry, F.A. Carey and R.J. Sunderg, Plenum.
3. A Guide Book to Mechanism in Organic Chemistry, Peter Sykes, Longman.
4. Structure and Mechanism in Organic Chemistry, C.K. Ingold, Comell University Press.
5. Organic Chemistry, R.T. Morrison and R.N. Boyd, Prentice-Hall.
6. Modern Organic Reactions, H.O. House, Benjamin.
7. Principles of Organic Synthesis, R.O.C. Norman and J.M. Coxon, Blackie Academic & Professionsl.
8. Reaction Mechanism in Organic Chemistry, S.M. Mukherji and S.P. Singh, Macmillan.
9. Pericyclic Reactions, S.M. Mukherji, Macmillan, India
10. Stereochemistry of Organic Compounds, D.Nasipuri, New Age International.
11. Stereochemisty of Organic Compounds, P.S. Kalsi, New Age International.
12. Spectroscopic methods in Organic Chemistry, D.H. Williams, I. Fleming, Tata McGraw-Hill.
13. Application of Spectroscopy of Organic Compounds, J.R. Dyer, Prentice Hall.
14. Organic Chemistry, J. McMurry, Thomson Asia.
15. Organic Chemistry, W. Kemp, ELBS, Macmillan.

COURSE OUTCOMES

The students will be able to

- Acquire the skills for correct stereo-chemical assignment and interpretation in rather simple organic molecules.
- Understanding of Organic reaction, rearrangement and cross-coupling reaction with their mechanism and application.

SEMESTER –I
Paper-III
MCH-403: PHYSICAL CHEMISTRY-I

COURSE OBJECTIVES

To make the student conversant with

- The objective of the course is to know the application of quantum mechanics in physical models and experiments of chemical systems. The student will be able to calculate the Energy of the system including E_{HOMO}, E_{LUMO} and bond order.
- The main objective of the course is to provide fundamental concepts of thermodynamics effects and relationships. The course is to give knowledge of comprehensive and rigorous treatment of classical thermodynamics, thermodynamics relations. Explain the concept of partial molar properties fugacity and activity.

Unit-I

Introduction to Exact Quantum Mechanical Results
Schrödinger equation and the postulates of quantum mechanics. Discussion of solutions of the Schrödinger equation to some model systems viz., particle in a box, the harmonic oscillator, the rigid rotor, the hydrogen atom and helium atom.

Unit-II
Approximate Methods
The variation theorem, linear variation principle. Perturbation theory (First order and nondegenerate). Applications of variation method and perturbation theory to the Helium atom.
Molecular Orbital Theory
Huckel theory of conjugated systems bond and charge density calculations. Applications to ethylene, butadiene, cyclopropenyl radical cyclobutadiene etc. Introduction to extended Huckel theory.

Unit-III
Angular Momentum
Ordinary angular momentum, generalized angular momentum, eigenfucntions for angular momentum, eigenvalues of angular momentum operator using ladder operators addition of angular momenta, spin, antisymmetry and Pauli exclusion principle.

Unit-IV
Classical Thermodynamics
Brief resume of concepts of laws of thermodynamics, free energy, chemical potential and entropies. Partial molar free energy, partial molar volume and partial molar heat content and their significance. Determinations of these quantities. Concept of fugacity and determination of fugacity. Non-ideal systems : Excess function s for non-ideal solutions. Activity, activity coefficient, Debye Huckel theory for activity coefficient fo electrolytic solutions; determination of activity and activity coefficients; ionic strength. Application of phase rule to three component systems; second order phase transitions.

Unit-V
Statistical Thermodynamics
Concept of distribution, thermodynamic probability and most probable distribution. Ensemble averaging, postulates of ensemble averaging. Canonical, grand canonical and micro-canonical ensembles, corresponding distribution laws (using Lagrange's method of undetermined multipliers). Partition functions-translation, rotational, vibrational and electronic partition functions, Calculation of thermodynamic properties in terms of partition. Application of partition functions. Fermi-Dirac Statistics, distribution law and applications to metal. Bose-Einstein statistics distribution Law and application to helium.

Books Suggested

1. Physical Chemistry, P.W. Atkins, ELBS.
2. Introduction to Quantum Chemistyry, A.K. Chandra, Tata Mc Graw Hill.
3. Quantum Chemistry, Ira N. Levine, Prentice Hall.
4. Coulson's Valence, R.Mc Ween y, ELBS.
5. Chemical Kinetics. K.J. Laidler, McGraw-Hill.
6. Kinetics and Mechanism of Chemical Transformation J.Rajaraman and J. Kuriacose, Mc Millan.
7. Micelles, Theoretical and Applied Aspects, V. MOraoi, Plenum.
8. Modern Electrochemistry Vol. 1 and Vol II J.O.M. Bockris and A.K.N. Reddy, Planum.
9. Introduction to Polymer Science, V.R. Gowarikar, N.V. Vishwanathan and J. Sridhar, Wiley Eastern.
10. Introduction to Quantum Chemistry-R.K. Prasad, New Age Publication.
11. Thermodynamics for students of Chemistry, Shobanlal Nagin Chand Co. 1986.

COURSE OUTCOMES

- Students will be able to grasp fundamental concepts of operators, algebra of operators and quantum mechanical and Schrodinger wave equations for single and multi electron systems.

- Students will be able to grasp fundamental concepts of operators, algebra of operators and quantum mechanical and Schrodinger wave equations for single and multi electron systems.
- The student will be able to perform energy calculation for conjugated hydrocarbon systems.
- Students will also understand various thermodynamic relationship, the concept of free energy and partial molar quantities, activity and activity coefficients and determination.

SEMESTER– I
Paper-IV
MCH-404: (a) MATHEMATICS FOR CHEMISTS
(For students without Mathematics in B.Sc.)

COURSE OBJECTIVES

The objective of the course is to know the basics of the mathematics which are generally applied in chemistry viz., vectors and matrix algebra, differential and integral calculus, permutation and probability

Unit-I

Vectors

Vectors, dot, cross and triple products etc. gradient, divergence and curl, Vector Calculus.

Matrix Algebra

Addition and multiplication; inverse, adjoint and transpose of matrices.

Unit-II

Differential Calculus

Functions, continuity and differentiability, rules for differentiation, applications of differential calculus including maxima and minima (examples related to maximally populated rotational energy levels, Bohr's radius and most probable velocity from Maxwell's distribution etc.).

Unit-III

Integral calculus

Basic rules for integration, integration by parts, partial fractions and substitution. Reduction formulae, applications of integral calculus. Functions of several variables, partial differentiation, co-ordinate transformations (e.g. Cartesian to spherical polar).

Unit-IV

Elementary Differential equations

First-order and first degree differential equations, homogenous, exact and linear equations. Applications to chemical kinetics, secular equilibria, quantum chemistry etc. second order differential equation and their solutions.

Unit-V

Permutation and Probability

Permutations and combinations, probability and probability theorems average, variance root means square deviation examples from the kinetic theory of gases etc., fitting (including least squares fit etc with a general polynomial fit.

Books Suggested

1. The chemistry Mathematics Book, E.Steiner, Oxford University Press.
2. Mathematics for chemistry, Doggett and Suiclific, Logman.
3. Mathematical for Physical chemistry : F. Daniels, Mc. Graw Hill.
4. Chemical Mathematics D.M. Hirst, Longman.
5. Applied Mathematics for Physical Chemistry, J.R. Barante, Prentice Hall.
6. Basic Mathematics for Chemists, Tebbutt, Wiley.

7. Mathematics for Chemists, Bhupendra Singh, Pragati Prakashan.
8. Defferential Calulus/Integral Calculus, Dr. G. Prasad, Ppthishala Pvt. Ltd.
9. A Course in Vectors and their Applications: R. S. Mishra, Prakashan Kendra, Lucknow.

COURSE OUTCOMES

Basic mathematics is the back bone of modern chemistry. Students from biology background are also taking admission in the Program. Hence, the course is useful in understanding topics where mathematics is involved.

SEMESTER –I
Paper-IV
MCH-404 (b) BIOLOGY FOR CHEMISTS
(For students without Biology in B.Sc.)

COURSE OBJECTIVES

The Chemistry involved in biological processes is need of the time. Therefore, the main objective of the course is to know the basics of the biology which are generally applied in chemistry. The students will be able to understand the biological process through the course.

Unit-I

Cell Structure and Functions

Structure prokaryotic and eukaryotic cells, intracellular organelles and their functions, comparison of plant and animal cells. Ove4rview and their functions, comparison of plant and animal cells. Overview of metabolic processes-catabolism and anabolism. ATP – the biological energy currency. Origin of life-unique properties of carbon chemical evolution and rise of living systems. Introduction to bio-molecules, building blocks of biomacromolecules.

Unit-II

Carbohydrates

Conformation of monosaccharides, structure and functions of important derivatives of mono-saccharides like glycosides, deoxy sugars, myoinositol, amino sugars. Nacetylmuramic acid, sialic acid disaccharides and polysaccharides. Structural polysaccharides cellulose and chitin. Storage polysaccharides-starch and glycogen. Structure and biological function of glucosaminoglycans of mucopolysaccharides. Carbohydrates of glycoporteins and glycolipids. Role of sugars in biological recognition. Blood group substances. Ascorbic acid.

Unit-III

Lipid

Fatty acids, essential fatty acids, structure and function of triacylglycerols, glycerophospholipids, sphingolipids, cholesterol, bile acids, prostaglandins. Liproproteins-compositiion and function, role in atherosclerosis. Properties of lipid aggregates-micelles, bilayers, liposomes and their possible biological functions. Biological membranes. Fluid mosaic model of membrane structure. Lipid metabolism-boxidation of fatty acids.

Unit-IV

Amino-acids, Peptides and Proteins

Chemical and enzymatic hydrolysis of proteins to peptides, amino acid sequencing. Secondary structure of proteins. force responsible for holding of secondary structures. ahelix, -b-sheets, super secondary structure, triple helix structure of collagen. Tertiary structure of protein-folding and domina structure. Quaternary structure. Amino acid metabolism-degradation and biosynthesis of amino acids, sequence determination:

chemical/enzymatic/mass spectral, racemization/detection. Chemistry of oxytocin and tryptophan releasing hormone (TRH).

Unit-V

Nucleic Acids

Purine and pyrimidine bases of nucleic acids, base pairing via Hbounding. Structure of ribonucleic acids (RNA) and deoxyribonucleic acid (DNA), double helix model of DNA and forces responsible for holding it. Chemical and enzymatic hydrolysis of nucleic acids. The chemical basis for heredity, an overview of replication of DNA, transcription, translation and genetic code. Chemical synthesis of mono and trinucleoside.

Books Suggested

1. Principles of Biochemistry, A.L. Lehninger, Worth Publishers.
2. Biochemistry, L. Stryer, W.H. Freeman.
3. Biochemistry, J. David Rawan, Neil Patterson.
4. Biochemistry, Voet and Voet, John Wiley.
5. Outlines of Biochemistry E.E. Conn and P.K. Stumpf, John Wiley.

COURSE OUTCOMES

Basic knowledge of biology is also involved in chemistry related to real life problems which chemistry students must know. The students coming from Mathematics background are made aware o the basic knowledge required. Hence, the course is useful in understanding topics covered in this course.

SEMESTER –I
PRACTICAL
(Duration: 6 hrs in each branch)

Note- Practical examination of Inorganic/Organic/Physical will be conducts at the end of each semester during examination.

Inorganic Chemistry

COURSE OBJECTIVES

The students will learn

- The basics of quantitative estimation of metal complexes.
- To separate different ions by paper chromatography.
- The interpretation od IR spectra of metal complexes.

Experiment - 1	15
Experiment -2	15
Viva Voce	10
Record	10
Total	**50**

1. **Chromatographic Separations**
   (a) Cadmium and zinc
   (b) Zinc and magnesium
   (c) Lead and silver

2. **Complexometric titration**
   Estimation of Ca^{2+}, Mg^{2+} and Zn^{2+}

3. **Interpretation of IR spectra of some known inorganic complexes.**

Books Suggested

1. Synthesis and Characterization of Inorganic Compounds, W. L. Jolly, Prentice Hall.
2. Inorganic experiments, 3rd edition, J. D. Woollins, Wiley-VCHVerlag GmbH @Co.KGaA, 2012.
3. Foundations of College Chemistry in the Laboratory, M. Hein, J. N. Peisen and R. L. Miner, John Wiley and Sons, 2011.
4. In-house Laboratory Manual, Departmentof Chemistry, APSU Rewa.

COURSE OUTCOMES

The students will be able to

- Estimate the metals from metal complexes.
- Separate and analyze different metal ions using paper chromatography.
- Identify the different groups present in the complexes.

Physical Chemistry

COURSE OBJECTIVES

To introduce experiments in chemical kinetics and equilibrium chemistry.

Experiment – 1	15
Experiment -2	15
Viva Voce	10
Record	10
Total	**50**

1. **Chemical Kinetic**s
   (a) Determination of velocity constant of the hydrolysis of methyl acetate catalysed by an acid (say HCl, H_2SO_4, etc.).
   (b) Determination of velocity constant of saponification of ethyl acetate with sodium hydroxide.
   (c) Determination of velocity of the reaction between potassium persulphate and potassium iodide.
2. **To determine the distribution coefficient of benzoic acid between toluene and water at room temperature.**

3. **To determine equilibrium constant for the reaction between iodide and iodine by the method of distribution.**

Books Suggested

1. An introduction to Statistical Thermodynamics, T. A. Hill, Dover Publications Inc., 1987.
2. Chemical Kinetics, K. J. Laidler, Pearson Education, 3rd edition, 2011.
3. Findley's Practical Physical Chemistry, B. P. Levitt, Longman.
4. Practical Physical Chemisry, A. M. James and F. E. Prichard, Longman.

COURSE OUTCOMES

Students will obtain hands on experience on chemical kinetics and equilibrium parameters.

Organic Chemistry

COURSE OBJECTIVES

To introduce organic synthesis, purification and identification of organic compounds using physiochemical techniques.

Experiment - 1	15
Experiment -2	15
Viva Voce	10
Record	10
Total	**50**

1. **Qualitative Analysis**
   Separation, purification and identification of compounds of ternary mixture (one liquid and one solid) using TLC and columns chromatography, chemical tests. IR spectra to be used for functional group identification.

2. **Organic Synthesis**
   Acetylation : Acetylation of cholesterol and separation of cholesteryl acetate by column chromatography. Oxidation : Adipic acid by chromic acid oxidation of cyclothexaneol Grignard reaction : Synthesis of triphenylmethanol from benzoic acid Aromatic electrophilic sustitutions : Synthesis of p-nitroaniline and pbromoaniline. Aldol condensation Dibenzal acetone from benzaldehyde. Synthesis of different Schiff bases using salicylaldehyde and amines, Synthesys of different dithiocarbamates. The Products may be characterized by Spectral Techniques.

3. **Qualitative analysis of Bi-functional compounds**
   (a) Anthranilic acid
   (b) p-aminobenzoic acid
   (c) Resorcinol
   (d) Acetamide
   (e) α/β-naphthole

Books Suggested

1. Laboratory Manual in Organic Chemistry, R. K. Bansal, Wiley, 2006.
2. Vogel's Textbook of Practical Organic Chemistry, ELBS.
3. Practical Organic Chemistry, F. G. Mann and B. C. Saunders, Orient Longman.
4. Experimental Organic Chemistry Vol 1 and 2, P. R; Singh, D. S. Gupta and K. S. Bajpai, Tata McGraw Hill.

COURSE OUTCOMES

Ensures the students to understand acquire knowledge and have hands on experience in organic synthesis and analysis by using physiochemical techniques.

SEMESTER –II
Paper-V
MCH-405: INORGANIC CHEMISTRY-II

COURSE OBJECTIVES

The complexes of transition metals are very important topics of applied chemistry. Even in Medicinal chemistry these complexes play important role. The main objective of the course is to provide fundamental concept of

- The electronic spectral studies of transition metal complexes.
- Magnetic properties of transition metal complexes.
- Metal π-complexes and metal clusters.

- Optical rotatory dispersion (ORD) and circular dichroism (CD).

Unit-I

Electronic Spectral Studies of Transition Metal Complexes

Spectroscopic ground states, correlation. Orgel and Tanabe-Sugano diagrams for transition metal complexes (d1-d9 states), Selection rule for electronic spectroscopy. Intensity of various type electronic transitions. Calculations of 10Dq, B and β parameters, charge transfer spectra.

Unit-II

Magnetic Properties of Transition Metal Complexes

Anomalous magnetic moments, Quenching of Orbital contribution. Orbital contribution to magnetic moment, magnetic exchange coupling and spin crossover.

Unit-III

Metal π-Complexes

Metal carbonyl, structure and bonding, vibrational spectra of metal carbonyls for bonding and structural elucidation, important reactions of metal carbonyls; preparation, bonding structure and important reaction of transition metal nitrosyl, dinitrogen and dioxgen complexes; tertiary phosphine as ligand, Wilkinson's catalyst.

Unit-IV

Metal Clusters

Synthesis, reactivity and bonding

Borane Chemistry

Higher boranes, carboranes, metalloboranes and metallo-carboranes compounds with metal metal multiple bonds.

Unit-V

Optical Rotatory Dispersion and Circular Dichroism

Linearly and circularly polarized lights; optical rotatory power and circular birefringence, elipticity and circular dichroism; ORD and Cotton effect, Faraday and Kerr effects; Assignment of electronic transitions; applications of ORD and CD for the determination of (i) absolute configuration of complexes and (ii) isomerism due to non-planarity of chelate rings.

Books Suggested :

1. Advanced Inorganic Chemistry, F.A. Cotton and Wilkinson, John Wiley.
2. Inorganic Chemistry, J.E. Huhey, Harpes & Row.
3. Chemistry of the Elements. N.N. Greenwood and A. Earnshow, Pergamon.
4. Inorganic Electronic Spectroscopy, A.B.P. Lever, Elsevier.
5. Magnetiochemistry, R.L. Carlin, Springer Verlag.
6. Comprehensive Coordiantion Chemistry eds., G. Wilkinson, R.D. Gillars and J.A. Mc Cleverty,Pergamon.

COURSE OUTCOMES

- Student will be able to understand the spectroscopic ground states of d^1 to d^9 systems.
- They will gain the knowledge of magnetic moment and magnetic exchange coupling of transition metal complexes.
- Student will get the basic idea about metal-π complexes and metal clusters.

SEMESTER –II
Paper-VI
MCH-406: ORGANIC CHEMISTRY-II

COURSE OBJECTIVES

Understanding of chemical reaction and their mechanism is essential part of chemistry. This course is introduced for the detailed study of aromatic electrophilic substitution, aromatic nucleophilic substitution, free radical reactions, addition reactions, addition to carbon-hetero multiple bonds, elimination reactions. This course also imparts knowledge on different classes of pericyclic reactions.

Unit-I

Aromatic Electrophilic Substitution

The arenium ion mechanism, orientation and reactivity, energy profile diagrams. The ortho/para ratio, ipso attack, orientation in other ring systems. Quantitative treatment of reactivity in substrates and electrophiles. Diazonium coupling, Vilsmeir reactiion, Gatterman-Koch reaction

Aromatic Nucleophilic Substitution

The SNAr SN^1, benzyne and SN^1 mechanism, Reactivity effect of substrate structure, leaving group and attacking nucleophile. The Von Richte. Sommelet-Hauser, and Smiles rearrangements.

Unit-II

Free Radical Reactions

Types of free radical reactions, free radical substitution mechanism, mechanism at an aromatic substrate, neighbouring group assistance. Reactivity for aliphatic and aromatic substrates at a bridgehead. Reactivity in the attacking radicals. The effect of solvents on reactivity. Allylic halogenation (NBS), oxidation of aldehydes to carboyxlic acids, autooxidation, coupling of alkynes and arylation of aromatic compounds by diazonium salts, Sandmeyer reaction. Free radical rearrangement. Hunsdiecker reaction.

Unit III

Addition Reactions

Mechanistic and stereochemical aspects of addition reactions involving electrophiles, nucleophiles and free radicals, regio-and chemoselectivity, orientation and reactivity. Addition to cyclopropane ring. Hydrogenation of double and triple bounds, hydrogenation of aromatic rings. Hydroboration, Michael reaction, sharpless asymmetric epoxidation.

Unit-IV

Addition to Carbon-Hetero Multiple bonds

Mechanism of metal hydride reduction of saturated and unsaturated carbonyl compounds, acid esters and nitriles. Addition of Grignard reagents, organozinc and organolithium reagents to carbonyl and usaturated carbonyl compounds. Witting reaction. Mechanism of condensation reactions involving enolates-Aldol, Knoevenagel, Claisen, Mannich, Benzoin, Perkin and Stobbe reactions. Hydrolysis of esters and amides, ammonolysis of esters.

Elimination Reactions

The E2, E1 and E1 cB mechanisms and their spectrum. Orientation of the double bond. Reactitivty-effects of substrate structures, attacking base, the leavign group and the medium. Mechanism and orientation in pyrolytic elimination.

Unit-V

Pericyclic Reactions

Molecular orbital symmetry, Frontier orbitals of ethylene, 1,3-butadiene, 1,3,5-hexatriene
and allyl system. Classification of periycyclic reactions. Woodward-Hoffmann correlatino diagrams. FMO and PMO approach. Electrocyclic reactions-conrotatory and disrotatory motions, 4n 4n+2 and allyl systems. Cycloadditions-antarafacial and suprafacial additions, 4n and 4n+2 systems, 2+2 addition of ketenes, 1,3 dipolar cycloadditions and cheleotrpic reactions. Sigmatropic rearrangements-suprafacial and antarafacial

shifts of H, sigmatropic involving carbon moieties, 3,3- and 5,5 sigmatropic rearrangements. Claise n, Cope and aza-Cope rearrangements. Fluxional tautomerism. Ene reaction.

Books Suggested

1. Advanced Organic Chemistry-Reactions, Mechanism and Structure, Jerry March, John Wiley.
2. Organic Chemistry, R.T. Morrison and R.N. Boyd, Prentice-Hall.
3. Modern Organic Reactions, H.O. House, Benjamin.
4. Principles of Organic Synthesis, R.O.C. Norman and J.M. Coxon, Blackie.
5. Reaction Mechanism in Organic Chemistry, S.M. Mukherji and S.P. Singh, Macmillan.
6. Pericyclic Reactions, S.M. Mukherji, Macmillan, India.
7. Stereochemisty of Organic Compounds, P.S. Kalsi, New Age International.
8. Spectroscopic Methods in Organic Chemistry, D.H. Williams, I. Fleming, Tata McGraw-Hill.
9. Organic Chemistry, P.Y. Bruice, Pearson Education Asia.

COURSE OUTCOMES

- The student will be able to know the different types of organic reactions.
- Students will also understand the stereochemical aspects of different classes of pericyclic reactions.

SEMESTER–II
Paper-VII
MCH-407: PHYSICAL CHEMISTRY-II

COURSE OBJECTIVES

- Students will gain knowledge of chemical dynamics and non-equilibrium thermodynamics.
- Student will understand different aspects of the surface chemistry
- Student will develop skills to solve problems relating to molecular weights of macromolecules.
- The students will understand advance knowledge of electrochemistry.

Unit-I

Chemical Dynamics

Methods of determining rate laws, collision theory of reaction rates, steric factor, activated complex theory, Arrhenius equation and the activated complex theory; ionic reactions, kinetic salt effects, steady state kinetics, kinetic and thermodynamic control of reactions, treatment of unimolecular reactions. Dyamic chain (hydrogen-bromine reaction, pyrolysis of acetaldehyde, decomposition of ethane), photochemical (hydrogenbromine and hydrogen-chlorine reactions) and homogenous catalysis, kinetics of enzyme reactions, general features fo fast reactions, study of fast reactions by flow method, relaxation method, flash photolysis ad the nuclear magnetic resonance method, dynamics of unimolecular reactiosn (Lindemann Hinshelwood and Rice-Ramsperger-Kassel- Marcus (RRKM) theories for unimolecular reactions).

Unit-II

Surface Chemistry

Adsorption

Surface tension, capillary action, pressure difference across curved surface (Laplace equation), vapour pressure of droplets (Kelvin equation), Gibbs adsorption isotherm, estimation of surface area (BET equation), Surface films on liquids (Electro-kinetic phenomenon).

Micelles

Surface active agents, classification of surface active agents, micellization, hydrophobic interaction, critical micellar concentration (CMC), factors affecting the CMC of surfactants, counter ion binding to micelles, thermodynamics of micellization-phase separation and mass action models, solublization, micro emulsion, reverse micelles.

Unit-III

Macromolecules

Polymer-definition, types of polymers, electrically conducting, fire resistant, liquid crystal polymers, kinetics of polymerization, mechanism of polymerization. Molecular mass, number and mass average molecular mass, molecular mass determination (Osmometry, viscometry, diffusion and light scattering methods), sedimentation, chain configuration of macromolecules, calculation of average dimension of various chain structures.

Emulsions

Theories of emulsification, coagulation, slow and rapid coagulation. Kenitics of coagulation. Von Smoluchouski equation and its verification.

Unit-IV

Non Equilibrium Theromodynamics

Thermodynamic criteria for non-equilibrium states, entropy production and entropy flow,
entropy balance equations for different irreversible processes (e.g., heat flow, chemical reaction etc.) transformations of the generalized fluxes and forces, non equilibrium stationary states, phenomenological equations, microscopic reversibility and Onsager's reciprocity relations, electrokinetic phenomena, diffusion, electric conduction.

Unit-V

Electrochemistry

Electrochemistry of solutions. Debye-Huckel-Onsager treatment and its extension, ion solvent interactions. Debye-Huckel-Jerum mode. Thermodynamics of electrified interface equations. Derivation of electro capillarity, Lippmann equations (surface excess), methods of determination. Structure of electrified interfaces. Overpotentials, exchange current density, derivation of Butler Volmer equation, Tafel plot. Quantum aspects of charge transfer at electrodes-solution interfaces, quantization of charge transfer, tunneling. Semiconductor interfaces-theory of double layer at semiconductor, electrolyte solution interfaces, structure of double layer interfaces. Effect of light at semiconductor solution interface. Polarography theory, Ilkovic equation; half wave potential and its significance.

Books Suggested

1. Physical Chemistry, P.W. Atkins, ELBS.
2. Introduction to Quantum Chemistry, A.K. Chandra, Tata Mc Graw Hill.
3. Quantum Chemistry, Ira N. Levine, Prentice Hall.
4. Coulson's Valence, R.Mc Ween y, ELBS.
5. Chemical Kinetics. K.J. Laidler, McGraw-Hill.
6. Kineties and Mechanism of Chemical Transformation J.Rajaraman and J. Kuriacose, Mc Millan.
7. Micelles, Theoretical and Applied Aspects, V. MOraoi, Plenum.
8. Modern Electrochemistry Vol. 1 and Vol II J.O.M. Bockris and A.K.N. Reddy, Planum.
9. Introduction to Polymer Science, V.R. Gowarikar, N.V. Vishwanathan and J. Sridhar, Wiley Eastern.
10. Physical Chemistry, P.C. Rakshit.
11. Quantum Chemistry, Eyring and Kimball.

COURSE OUTCOMES

- Students will be able to explain the process taking place in any chemical reaction.
- The basics of non-equilibrium thermodynamics will also be understood.
- Students will be able to have understanding about surface chemistry and its applications.
- Students will be able to solve the problems related to molecular weights of macromolecules.
- Students will understand the advance electrochemistry.

SEMESTER –II
Paper-VIII

MCH-408: Spectroscopy and Diffraction Methods

COURSE OBJECTIVES

The objective of this course is to give basic principles and applications of modern spectroscopic techniques (Nuclear Magnetic Resonance Spectroscopy, Nuclear Quadrupole Resonance Spectroscopy and Electron Spin Resonance Spectroscopy) and Diffraction Techniques (X-ray Diffraction, Electron Diffraction and Neutron Diffraction).

Unit-I

Nuclear Magnetic Resonance Spectroscopy

Nuclear spin, nuclear resonance, saturation, shielding of magnetic nuclei, chemical shift and its measurements, factors, influencing chemical shift, deshielding, spin-spin interactions, factors influencing coupling constant "j" Classification (AXB, AMX, ABC, A2B2 etc.). spin decoupling; basic ideas about instrument, NMR studies of nuclei other than protin-13C, 19F and ^{31}P. FT NMR, advantages of FT NMR.

Unit II

Nuclear Quadrupole Resonance Spectroscopy

Quadrupole nuclei, quadrupole moments, electric field gradient, coupling constant, splitting, General principles and Instrumentation, Applications.

Unit-III

Electron Spin Resonance Spectroscopy

Basic principles, zero field splitting and Kramer's degeneracy, factors affecting the 'g' value. Isotropic and anisotropic hyperfine coupling constants, some representative examples of esr spectra of Cu^{2+} and $V(O)^{2+}$ complexes, spin Hamiltonian, spin densities and Mc Connell relationship, measurement techniques, applications.

Unit-IV

X-ray Diffraction

Bragg condition, Miller indices, Laue Method, Bragg method, Debye Scherrer method of X-ray structural analysis of crystals, index reflections, identification of unit cells from systematic absences in diffraction pattern, Structure of simple lattices and X-ray intensities, structure factor and its relation to intensity and electron density, phase problem. Description of the procedure for an X-ray structure analysis, absolute configuration of molecules.

Unit-V

Electron Diffraction

Scattering intensity vs. scattering angle, Wierl equation, measurement technique, elucidation of structure of simple gas phase molecules. Low energy electron diffraction and structure of surfaces.

Neutron Diffraction

Scattering of neutrons by solids measurement techniques, Elucidation of structure of magnetically ordered unit cells.

Books suggested

1. Modern Spectroscopy, J.M. Hollas, John Viley.
2. Applied Electron Spectroscopy for chemical analysis d. H. Windawi and F.L. Ho, Wiley Interscience.
3. NMR, NQR, EPr and Mossbauer Spectroscopy in Inorganic Chemistry, R.V. Parish, Ellis Harwood.
4. Nuclear Qudrupole Resonance Spectroscopy, T.P. Das and E.L. Hann, Academic Press, New York and London, 1958.
5. Physical Methods in Chemistry, R.S. Drago, Saunders College.
6. Chemical Applications of Group Theory, F.A. Cotton.
7. Introduction to Molecular Spectroscopy, G.M. Barrow, Mc Graw Hill.
8. Basic Principles of Spectroscopy, R. Chang, Mc Graw Hill.

9. Theory and Application of UV Spectroscopy, H.H. Jaffe and M. Orchin, IBHOxford.
10. Introduction to Photoelectron Spectroscopy, P.K. Ghosh, John Wiley.
11. Introduction to Magnetic Resonance. A Carrington and A.D. Maclachalan, harper & Row.

COURSE OUTCOMES

- The Knowledge of modern spectroscopy such as NMR, NQR and ESR, symmetry of structure etc. and their applications is useful in understanding the different inorganic and organic molecules.
- Student will able to solve the molecular structures using different diffraction techniques.

SEMESTER –II
PRACTICAL
(Duration: 6 hrs in each branch)

Inorganic Chemistry

COURSE OBJECTIVES

The students will learn estimation of metal ions (gravimetrically and volumetrically) and inorganic synthesis.

Experiment - 1	15
Experiment -2	15

Viva Voce	10
Record	10
Total	**50**

1. **Separation and estimation of two metal ions**
   (a) Estimation of copper and nickel both by gravimetric method.
   (b) Estimation of barium gravimetrically and copper volumetrically methods.
   (c) Estimation of copper and zinc in a mixed solution of both by gravimetric methods.
   (d) Estimation of nickel and zinc in a mixed solution of both by gravimetric methods.

2. **Preparation and synthesis of metal complexes**
   (a) $VO(acac)_2$
   (b) $Ni(acac)_2$
   (c) $K_3[Fe(C_2O_4)_3]$
   (d) Prussian Blue, Turnbull's Blue.
   (e) $Co(NH_3)_6]$ $[Co(NO_2)_6]$
   (f) $Hg[Co(SCN)_4]$
   (g) $[Cu(NH_3)_4]SO_4.H_2O$
   (h) $[Ni(NH_3)_6]Cl_2$
   (i) $Ni(dmg)_2$

3. **Interpretation of Electron Paramagnetic Resonance (epr) spectra of some paramagnetic complexes.**

Books Suggested

1. Synthesis and Technique in Inorganic Chemistry: A Laboratory Manual, 3rd edition, G. S. Girolami, T. B. Rauchfuss and R. J. Angelici, University Science Books, 1999.
2. Advanced Practical Chemistry, R. Mukhopadyay and P. Chatterjee, Books & Allied (P) Ltd., 2007.
3. Quantitative Chemical Analysis, 6th edition, J. Mendham, R. C. Denney, M. J. K. Thomas David and J. Barnes, Prentice Hall, 2000.
4. Analytical Chemistry, S. M. Khopker, New Age International Ltd., Dew Delhi.

COURSE OUTCOMES

The students will be able to understand estimation of metal ions and synthesizing inorganic complexes.

Physical Chemistry

COURSE OBJECTIVES

To make the students expertise in electrochemistry and interpretation of thermodynamic, kinetic and QSAR parameters.

Experiment - 1	15
Experiment -2	15
Viva Voce	10
Record	10
Total	**50**

1. **Determination of composition of a mixture of weak and strong acids by conductor metric titration of following acids:**

(a) HCl and CH_3COOH
(b) HNO_3 and CH_3COOH
(c) H_2SO_4 and CH_3COOH

2. **Determination of composition of a mixture of weak and strong acids by pH metric titration of followings acids:**
   (a) HCl and CH_3COOH
   (b) HNO_3 and CH_3COOH
   (c) H_2SO_4 and CH_3COOH

3. **Theoretical interpretation of Thermodynamic parameters, kinetic parameters and QSAR parameters.**

Books Suggested

1. Experimental Physical Chemistry, V. D. Athawale, New Age International, 2007.
2. Practical Physical Chemistry, B. Viswanathan and P.S. Raghavan, Viva Books Pvt. Ltd., 2005.
3. Experimental Physical Chemistry, R. C. Das and B. Behera, Tata McGraw Hill.
4. Practical Physical Chemistry, A. M. James and F. E. Prichard, Longman.

COURSE OUTCOMES

Students will be able to

- Determine the composition of mixtures of two acids using conductometric and pH-metric methods.
- Difference thermodynamics, kinetic and QSAR parameters.

Organic Chemistry

COURSE OBJECTIVES

To make the students conversant with

- Identification of hydroxyl groups in organic compounds.
- Estimation amines and phenols.
- Oil sample estimation.
- Determination of water quality parameters.
- Multistep synthesis.

Experiment - 1	15
Experiment -2	15
Viva Voce	10
Record	10

Total	**50**

1. **Quantitative Analysis**
   Determination of the percentage or number of hydroxyl groups in an organic compound by acetylation method. Estimation of amines/phenols using bromate bromide solution/or acetylation method. Determination of iodine and Saponification values of an oil sample. Determination of DO, COD and BOD of water sample.

2. **Multistep preparation**
   (a) m-nitro aniline from nitrobenzene
   (b) Hippuric acid from glycine
   (c) Aspirin from salicylic acid
   (d) p-bromo aniline from aniline
   (e) phthalamide from phthlic acid

3. **Interpretation of some IR and NMR spectra of some known compounds.**

Books Suggested

1. Experiments and techniques in Organic Chemistry, D. Pasto, C. Johnson and M. Miller, Prentice Hall.
2. Organic Chemistry-Lab Manual, N. S. Gnanapragasam, G. Ramamurthy and S. Viswanathan Co. Pvt. Ltd., 1998.
3. Vogel's Practical Organic Chemistry, A. I. Vogel, A. R. Tatchell, B. S. Furnis, A. J. Hannaford and P. W. G. Smith, 5th edition, Pearson education Ltd., 1996.
4. Handbook of Organic Analysis-Qualitative and Quantitative, H. Clarke and A. Arnold.

COURSE OUTCOMES

At the end of semester, the students will be able to

- Identify the hydroxyl groups in organic compounds.
- Estimate amines and phenols.
- Determine water quality parameters from water samples.

SEMESTER –III
Paper-I
MCH-502: APPLICATION OF SPECTROSCOPY

COURSE OBJECTIVES

The paper of application of spectroscopy is introduced for the detailed studies of fundamental concepts, tools and techniques used behind UV-visible, infra red, Raman, NMR, Mössbauer and Mass Spectrometric methods for structural determination of molecules.

Unit-I

Ultraviolet and Visible spectroscopy

Various electronic transitions (185-800 nm) Beer-Lambert law, effect of solvent on electronic transitions, ultraviolet bands for carbonyl compounds, unsaturated carbonyl compounds, dienes, conjugated polyenes, Fieser Woodward rules for conjugated dienes and carbonyl compounds, ultraviolet spectra of aromatic compounds. Steric effect in biphenyls. Electronic Spectral Studies for d^1- d^9 systems in octahedral, tetrahedral and square planar complexes with some representative examples of electronic spectra with some representative examples of electronic spectra.

Unit-II

Infrared and Raman Spectroscopy

Characteristic vibrational frequencies of alkanes, alkenes, alkynes, aromatic compounds, alcohols, ether's, phenols and amines. Detailed study of vibrational frequencies of carbonyl compounds (ketone's, aldehyde's, esters, amides, acids, anhydride's, lactones, lactams and conjugated carbonyl compounds). Effect of hydrogen bonding and solvent effect on vibrational frequencies, overtones, combination bands and fermi resonance. Infrared and Raman spectra of AB_3, AB_4, AB_5 and AB_6, mode of bonding of ambidentate ligands, nitrosyl, ethylenediamine and diketonato complexes, application of resonance Raman spectroscopy and its applications.

Unit-III

Nuclear Magnetic Resonance Spectroscopy – I

General introduction and definition, Chemical shift, spin – spin interaction, shielding and deshilding mechanism, mechanism of measurement of chemical shift values and correlation for protons bonded to carbon (aliphatic, olefinic, aldehydic and aromatic) and other nuclei (alcohols, phenols, enols, carboxylic acids, and amides & mercapto).

Nuclear Magnetic Resonance Spectroscopy – II

Chemical exchange, effect of deuteration, Complex spin – spin interation between two, three, four and five nuclei (I order spectra) Stereochemistry, hindered rotation, Karplus curve-variation of coupling constant with disordered angle, NMR shift reagents, solvent effects, Nuclear overhauser effect (NOE).

Unit-IV

Mössbauer Spectroscopy

Basic principles, spectral parameters and spectrum display. Application of the technique to the studies of (1) bonding and structures of Fe^{+2} and Fe^{+3} compounds including those of intermediate spin, (2) Sn^{+2} and Sn^{+4} compounds nature of M-L bond, coordination number, structure and (3) detection of oxidation state and in equivalent MB atoms.

Unit V

Mass Spectrometry

Introduction ion production E1, C1 FD, ESI and FAB, factors affecting fragmentation, ion analysis, ion abundance Mass spectral fragmentation of organic compounds, common functional groups, molecular ion peak, metastable peak. Me Lafferty rearrangement. Nitrogen rule. High resolution mass spectrometry. Structure elucidation of simple molecules using UV – Visible, IR, NMR and mass spectral techniques.

Books Suggested

1. Physical Methods for Chemistry, R.S. Drago, Saunders Compnay.
2. Structural Methods in Inorganic Chemistry, E.A.V. Ebsworth, D.W.H. Rankin and S. Cradock, ELBS.
3. Infrared and Raman Spectral : Inorganic and Coordination Compounds K. Nakamoto, Wiley.
4. Progress in Inorganic Chemistry vol., 8, ed., F.A. Cotton, vol., 15 ed. S.J. Lippard, Wiley.
5. Transition Metal Chemistry ed. R.L. Carlin vol. 3 dekker.
6. Inorganic Electronic Spectroscopy, A.P.B. Lever, Elsevier.
7. NMR, NQR, EPR and Mossbauer Spectroscopy in Inorganic Chemistry, .V. Parish, Ellis Haywood.
8. Practical NMR Spectroscopy, M.L. Martin. J.J. Deepish and G.J. Martin, Heyden.
9. Spectrometric Identification of Organic Compounds, R.M. Silverstein, G.C. Bassler adn T.C. Morrill, John Wiley.
10. Introduction to NMR spectroscopy, R.J. Abraham, J. Fisher and P. Loftus, Wiley.
11. Application of Spectroscopy of Organic Compounds, J.R. Dyer Prentice Hall.
12. Spectroscopic Methods in Organic Chemistry D.H. Williams, I. Fleming, Tata McGraw-Hill.

COURSE OUTCOMES

After studying this course the student will be able to

- Understand the basics of UV-visible, infra red, Raman, NMR, Mössbauer and Mass Spectrometric techniques.
- Solve numerical and experimental graphs of all of the above techniques.
- Cover wide area of research in above spectroscopic methods.

SEMESTER –III
Paper II
MCH-501: PHOTOCHEMISTRY

COURSE OBJECTIVES

- To provide the students the basics of photochemistry and reaction mechanism.
- To impart the knowledge of photochemistry of carbonyl compounds and different type of photochemical reactions.

Unit-I

Photochemical Reactions

Interaction of electromagnetic radiation with matter, types of excitations, fate of excited molecule, quantum yield, transfer of excitation energy, actinometry.

Unit -II

Determination of Reaction Mechanism

Classification, rate constants and life times of reactive energy state determination of rate constants of reactions, Effect of light intensity on the rate of photochemical reactions, Types of photochemical reactions-photo dissociation, gas-phase photolysis.

Unit -III

Photochemistry of Alkene

Intramolecular reactions of the olefinic bond-geometrical isomerism, cyclisation reactions, rearrangement of 1,4- and 1,5-dienes.

Photochemistry of Aromatic Compounds

Isomerisations, additions and substitutions.

Unit -IV

Photochemistry of Carbonyl Compounds

Intramolecular reactions of carbonyl compounds-saturated, cyclic and acyclic, α, β, γ unsaturated and α, β, unsaturated compounds, cyclohexadienones, Intermolecular cyloaddition reactions-dimerisations and oxetane formation.

Unit-V

Miscellaneous Photochemical Reactions.

Photo-Fries reactions of annelids, Photo-Fries rearrangement, Barton reaction, Singlet molecular oxygen and its reactions, Photochemical formation of smog, Photodegration of polymers, Photochemistry of vision.

Books Suggested

1. Fundamentals of Photochemistry, K.K. Rothagi-Mukheriji, Wiley-Eastern.
2. Essentials of Molecular Photochemistry, A Gilbert and J. Baggott, Blackwell Scientific Publication.
3. Molecular Photochemistry, N.J. Turro, W.A. Benjamin.
4. Introductory Photochemistry, A. Cox and t. Camp, McGraw Hill.
5. Photochemistry, R.P. Kundall and A. Gilbert. Thomson Nelson.
6. Organic Photochemistry, J. Coxon and B. Halton, Cambridge University Press.
7. Photochemistry and Pericyclic reactions, J. Singh and J. Singh, New Age International, New Delhi.
8. Modern Molecular Photochemistry, N.J. Turro, University Science Book, California.

COURSE OUTCOMES

The students able to

- Get the knowledge of photochemical reactions and mechanism of photochemical reactions.
- Gain the knowledge of photochemistry of alkenes, aromatic compounds and carbonyl compounds along with miscellaneous photochemical reactions.

SEMESTER –IV
DISCIPLINE ELECTIVE
Paper III
MCH-503: Organotransition Metal Chemistry

COURSE OBJECTIVES

Organotransition metal chemistry is the study of chemical compounds containing at least one chemical bond between a carbon atom of an organic molecule and a transition metal. This paper is introduced for the detailed studies of transition metal organometallic compounds, organotransition metal catalysts and basic ideas of fluxional organometallic compounds.

Unit -I

Alkyls and Aryls of Transition Metals

Types, routes of synthesis, stability and decomposition pathways organocopper in organic synthesis.

Compounds of Transition Metal-Carbon Multiple Bonds

Alkylidenes, alkylidynes, low valent carbenes and carbynes-synthesis, nature of bond, structural characteristics, nucleophilic and electrophilic reactions on the ligands, role in organic synthesis.

Unit -II

Transition Metal π-Complexes

Transition metal π-Complexes with unsaturated organic molecules, alkenes, alkynes, allyl, diene, dienyl, arene and trienyl complexes, preparation, properties, nature of bonding and structural features. Important reactions relating to nucleophilic and electrophilic attack on ligands and to organic synthesis.

Unit -III

Transition organometalic compounds

Transition metal compounds with bonds to hydrogen, boron, silicon

Unit -IV

Homogeneous Catalysis

Stoichiometric reactions for catalysis, homogeneous catalytic hydrogenation, Zeigler- Natta polymerization of olefins, catalytic reactions involving carbon monoxide such as hydrocarbonylation of olefins (oxoreaction), explanation reactions, activation of C-H bond.

Unit -V

Fluxional Organometallic Compounds

Flexionality and dynamic equilibrium in compounds such as η^2 olefine, η^3-allyl and dienyl complexes.

Books Suggested

1. Principles and Application of Organotransition Metal Chemistry, J.P. Collman, L.S. Hegsdus, J.R. Norton and R.G. Finke, University Science Books.
2. The Organometallic Chemistry of the Transition Metals, R.H. Crabtree. John Wiley.
3. Metallo-organic Chemistry, A.J. Pearson, Wiley.
4. Organometallic Chemistry, R.C. Mehrotra and A. Singh New Age International.

COURSE OUTCOMES

On completion of the course students will be able to

- Acquire understanding of various classes of organotransition metal compounds- alkyl and aryls of transition metals, transition metal complexes of carbenes and carbynes and transition metal pi-complexes.
- Have understanding of catalysis reactions involving organotransition metal compounds and basics of fluxional organometallic compounds.
- Develop ideas for further research in the field of organotransition metal chemistry.

SEMESTER –III
DISCIPLINE ELECTIVE
Paper III
MCH-504: Heterocyclic Chemistry

COURSE OBJECTIVES

To provide knowledge on

- Heterocycles and non-aromatic heterocycles.
- Synthesis and characterization of various natural compounds of biological importance.
- heterocyclic compounds of biological and pharmaceutical importance.

Unit-I

Nomenclature of Heterocycles

Replacement and systematic nomenclature (HantzsMCH-Widman system) for monocyclic fused and bridged heterocycles.

Aromatic Heterocycles

General chemical behaviour of aromatic heterocycles, classification (structural type), criteria of aromaticity (bond lengths, ring current and chemical shifts in 1H NMRspectra. Empirical resonance energy, delocalization energy and Dewar resonance energy, diamagnetic susceptibility exaltations). Heteroaromatic reactivity and tautomerism in aromatic heterocycles.

Unit-II

Non-aromatic Heterocycles

Strain-bond angle and torsional strains and their consequences in small ring heterocycles. Conformatino of six-membered heterocycles with reference to molecular geometry, barrier to ring inversion, pyramidal inversino and 1,3-diaxial interaction. Stereo-electronic effects anomeric and related effects, Attractive interactions-hydrogen bonding and intermolecular nucleophilic lectrophilic interactions. Heterocyclic Synthesis Princples of heterocyclic synthesis involing cyclization reactions and cycloaddition reactions.

Unit-III

Small Ring Heterocycles

Three-membered and four-membered heterocycles-synthesis and reactions of azirodines, oxiranes, thiranes, azetidines, oxetanes and thietanes.

Benzo-Fused Five-Membered Heterocycles

Synthesis and reactions including medicinal applications of benzopyrroles, bezofurans and benzothiophenes.

Unit-IV

Meso-ionic Heterocycles

General classification, chemistry of some important meso-ionic heterocycles of type-A and B and their applications.

Six-Membered Heterocycles with one Heteroatom
Synthesis and reactions of pyrylium salts and pyrones and their comparison with pyridinium & thiopyrylium salts and phridones. Synthesis and reactions of quionlizinium and benzopyrylium salts, coumarins and chromones.

Unit-V
Six Membered Heterocycles with Two or More Heteroatoms Synthesis and reactions of diazones, triazines, tetrazines and thiazines. Seven-and Large-Membered Heterocycles Synthesis and reactions of azepines, oxepines, thiepines, diazepines thiazepines, azocines, diazocines, dioxocines and dithiocines.

Heterocyclic Systems Containing P, As, Sb and B
Heterocyclic rings containing phosphorus : Introduction, nomenclature, synthesis and characteristics of 5- and 6-membered ring systemsphosphorinaes, phosphorines, phospholanes and phospholes. Heterocyclic rings containing As and Sb: Introduction, synthesis and characteristics of 5- and 6-membered ring system. Heterocyclic rings containing B : Introduction, synthesis reactivity and spectral characteristics of 3- 5- and 6- membered ring system.

Books Suggested

1. Heterocyclic Chemistry Vol. 1-3, R.R. Gupta, M. Kumar and V.Gupta, Springer Verlag.
2. The Chemistry of Heterocycles, T. Eicher and S. Hauptmann, Thieme.
3. Heterocyclic chemistry J.A. Joule, K. Mills and g.F. Smith, Chapman and Hall.
4. Heterocyclic Chemistry, T.L. Gilchrist, Longman Scietific Techinal.
5. Contemporary Hetrocyclic Chemistry, G,.R. Newkome and W.W. Paudler, Wiley-Inter Science.
6. An Introductiion to the Heterocyclic Compounds, R.M. Acheson, Johnwiely.
7. Comprehensive Heterocyclic Chemistry, A.R. Katrizky and C.W. Rees, eds. Pergamon Press.

COURSE OUTCOMES

- Students will achieve insight on isolation, characterization and synthesis of various natural compounds of biological importance.
- Students will acquire knowledge on different heterocylic compounds.

SEMESTER –III
DISCIPLINE ELECTIVE
Paper III
MCH-505: Electrochemistry

COURSE OBJECTIVES

The objective of this course is

- To introduce students to conversion and storage of electrochemical energy
- To introduce students to give the basic idea about corrosion and stability of the metals.
- To introduce students to how different kinetic parameters for quasi and irreversible or evaluated etc.

Unit-I
Conversion and Storage of Electrochemical Energy Present status of energy Consumption
Pollution problem. History of fuel cells, Direct energy conversion by electrochemical means. Maximum intrinsic efficiency of an electrochemical converter. Physical interpretation of the Carnot efficiency factor in electrochemical energy converters. Power outputs. Electrochemical Generators (Fuel Cells): Hydrogen

oxygen cells, Hydrogen Air cell, Hydrocarbon air cell, Alkane fuel cell, Phosphoric and fuel cell, direct NaOH fuel cells, applications of fuel cells.

Electrochemical Energy Storage

Properties of Electrochemical energy storage : Measure of battery performance, Charging and discharging of a battery, Storage Density, Energy Density. Classical Batteries: (i) Lead Acid (ii)Nickel-Cadmium, (iii) Zinc manganese dioxide. Modern Batteries: (i) Zinc-Air (ii) Nickel-Metal Hydride, (iii) Lithium Battery, Future Electricity storers: Storage in (i) Hydrogen, (ii) Alkali Metals, (iii) Non aqueous solutions.

Unit-II

Corrosion and Stability of Metals

Civilization and Surface mechanism of the corrosion of the metals; Thermodynamics and the stability of metals, Potential -pH (or Pourbaix) Diaphragmsl; uses and abuses, Corrosion current and corrosion potential -Evans diagrams. Measurement of corrosion rate: (i) Weight Loss method, (ii) Electrochemical Method.

Inhibiting Corrosion

Cathodic and Anodic Protection. (i) Inhibition by addition of substrates to the electrolyte environment, (ii) by charging the corroding method from external source, anodic Protection, Organic inhibitors, The fuller Story Green inhibitors.

Passivation

Structure of Passivation films, Mechanism of Passivation, Spontaneous Passivation Nature's method for stabilizing surfaces.

Unit-III

Bioelectrochemistry

bioelectrodics, Membrane Potentials, Simplistic theory, Modern theory, Electrical conductance in biological organism: Electronic, Protonic electrochemical mechanism of nervous systems, enzymes as electrodes.

Kinetic of Electrode Process

Essentials of Electrode reaction. Current Density, Overpotential, Tafel Equation, Butler Volmer equation. Standard rate constant (K) and Transfer coefficient (a), Exchange Current.

Irreversible Electrode processes

Criteria of irreversibility, informatino from irreversible wave.

Unit-IV

Methods of determining kinetic parameters for quasi-rversible and irreversible waves

Koutecky's methods, Meits Israel Method, Gellings method.

Electrocatalysis

Chemical catalysts and Electrochemical catalysts with special reference to purostates, porphyrin oxides of rare earths. Electrocatalysis in simple redox reactions, in reaction involving adsorbed species. Influence of various parameters.

Unit-V

Potential Sweep Method

Linear sweep Voltammetry, Cyclic Voltammetry, theory and applications. Diagnostic criteria of cycli voltammetry. Controlled current microelectrode techniques : comparison with controlled potentials methods, chronopotentiometry, theory ad applications.

Bulk Electrolysis Methods

Controlled potential coulometry, Controlled Coulometry, Electroorganic synthesis and its important applications. Stripping analysis : anodic and Cathodic modes, Pre electrolysis and Stripping steps, applications of Stripping Analysis.

Books Suggested

1. Modern Electrochemistry Vol. I, IIa, Vol. IIB J'OM Bockris and A.K.N. Reddy, Plenum Publication, New York.
2. Polarographic Techniques by L. Meites, Interscience.
3. "Fuel Cells : Thjeir electrochemistry". McGraw Hill Book Company, New York.
4. Modern Polarographic Methods by A.M. Bond, Marcell Dekker.
5. Polarography and allied techniques by K. Zutshi, New age International publicatin. New Delhi.
6. "Electroaalytical Chemistry by Basil H. Vessor & Galen W. ; Wiley Interscience.
7. Electroanalytical Chemistry by Basil H. Vessor & alen w. ; Wiley Interscience.
8. Topics in pure and Applied Chemistry, Ed. S. K. Rangrajan, SAEST Publication, Karaikudi (India)

COURSE OUTCOMES

- Students to understand the concept of electrochemistry and it's various theories.
- Students will be able to determine various parameters / properties using different techniques, the knowledge of which helps them to use in different fields.

SEMESTER –III
GENERIC ELECTIVE
Paper IV
MCH-506: INDUSTRIAL CHEMISTRY

COURSE OBJECTIVES

The course provides an introduction to

- Industrial Gases and Inorganic Chemicals.
- To impart basic knowledge of Petroleum Chemistry.
- To learn how to make Glasses, Ceramics and Cements.
- To learn the manufacturing of Sugar, Papers, Leathers and Fertilizers.

Unit I

Industrial Gases and Inorganic Chemicals

Industrial Gases

Large scale production, uses, storage and hazards in handling of the following gases: oxygen, nitrogen, argon, neon, helium, hydrogen, acetylene, carbon monoxide, chlorine, fluorine, sulphur dioxide and phosgene.

Inorganic Chemicals

Manufacture, application, analysis and hazards in handling the following chemicals: hydrochloric acid, nitric acid, sulphuric acid, caustic soda, common salt, borax, bleaching powder, sodium thiosulphate, hydrogen peroxide, potash alum, chrome alum, potassium dichromate and potassium permanganate.

Industrial Metallurgy

Preparation of metals (ferrous and nonferrous) and ultra pure metals for semiconductor technology.

Unit II

Fuel Chemistry

Review of energy sources (renewable and non-renewable). Classification of fuels and their calorific value.

Petroleum and Petrochemical Industry

Composition of crude petroleum, Refining and different types of petroleum products and their applications. Fractional Distillation (Principle and process), Cracking (Thermal and catalytic cracking), Reforming Petroleum and non-petroleum fuels (LPG, CNG, LNG, bio-gas, fuels derived from biomass), fuel from waste, synthetic fuels (gaseous and liquids), clean fuels. Petrochemicals: Vinyl acetate, Propylene oxide, Isoprene, Butadiene, Toluene and its derivatives Xylene.

Lubricants
Classification of lubricants, lubricating oils (conducting and non-conducting) Solid and semisolid lubricants, synthetic lubricants. Properties of lubricants (viscosity index, cloud point, pore point) and their determination.

Unit III
Silicate Industries
Glass
Glassy state and its properties, classification (silicate and non silicate glasses). Manufacture and processing of glass. Composition and properties of the following types of glasses: Soda lime glass, lead glass, armoured glass, safety glass, borosilicate glass, fluorosilicate, coloured glass, photosensitive glass.

Ceramics
Important clays and feldspar, ceramic, their types and manufacture. High technology ceramics and their applications, super conducting and semi conducting oxides, fullerenes carbon nanotubes and carbon fiber.

Cements
Classification of cement, ingredients and their role, Manufacture of cement and the setting process, quick setting cements.

Unit IV
Sugar
Intruduction , Raw materials, Manufacture of sugar from Cane sugar, Cane sugar refining, By-products from sugar industries and their uses.

Pulp & paper
Various types of Pulps, Manufacture of pulps, Papers, Polymer modified papers, Board and structural materials.

Unit V
Leather
Introduction, Animal skins, Manufacture of leather, Byproducts, Chemicals used in leather industries.

Fertilizers
Introduction, Classification, Manufacturing of; Urea, Ammonium nitrate, Normal super phosphate & Triple super phosphate.

Books Suggested

1. E. Stocchi: Industrial Chemistry, Vol-I, Ellis Horwood Ltd. UK.
2. S. S. Dara: A Textbook of Engineering Chemistry, S. Chand & Company Ltd. New Delhi.
3. A. K. De, Environmental Chemistry: New Age International Pvt, Ltd, New Delhi.
4. O. P. Vermani, A. K. Narula: Industrial Chemistry, Galgotia Publications Pvt. Ltd., New Delhi.
5. P. C. Jain, M. Jain: Engineering Chemistry, Dhanpat Rai & Sons, Delhi.
6. P. C. Jain, M. Jain: Engineering Chemistry, Dhanpat Rai & Sons, Delhi.
7. Plastic Additives Technology Hand Book: Himadri Panda, Engineers India Research Institute.
8. Chemical process principales: part 1 & II – O.A / Hougen, K.M Watson RA Ragatz (CBS).

COURSE OUTCOMES

At the completion of this course, students should be able to

- Understand the basic concepts of Industrial Gases and Fuel Chemistry.
- Understand the manufacturing of Glasses, Ceramics, Cements, Sugar, Papers, Leathers and Fertilizers.

SEMESTER –III
GENERIC ELECTIVE
Paper IV
MCH-507: Medicinal Chemistry

COURSE OBJECTIVES

The objective of this course is

- Topic of Medicinal Chemistry due to its wide applications in our daily life. Medicinal Chemistry is an important discipline at the intersection of chemistry, especially synthetic organic chemistry, and pharmacology and various other biological specialties, where they are involved with design, chemical synthesis and development for market of pharmaceutical medicines.

Unit-I

Structure and activity

Relationship between chemical structure and biological activity (SAR). Receptor Site Theory. Approaches to drug design. Introduction to combinatorial synthesis in drug discovery. Factors affecting bioactivity. QSAR-Free-Wilson analysis, Hansch analysis, relationship between Free-Wilson analysis and Hansch analysis.

Unit-II

Pharmacodynamics

Introduction, elementary treatment of enzymes stimulation, enzyme inhibition, sulfonamides, membrane active drugs, drug metabolism, xenobiotics, biotransformation, significance of drug metabolism in medicinal chemistry.

Unit-III

Antibiotics and antibacterials

Introduction, Antibiotic β-Lactam type - Penicillins, Cephalosporins, Antitubercular. Streptomycin, Broad spectrum antibiotics . Tetracyclines, Anticancer – Dactinomycin (Actinomycin D)

Unit-IV

Antifungal

Polyenes, Antibacterial - Ciprofloxacin, Norfloxacin, Antiviral . Acyclovir .

Antimalarials: Chemotherapy of malaria. SAR. Chloroquine, Chloroguanide and Mefloquine

Unit-V

Non-steroidal Anti-inflammatory Drugs

Diclofenac Sodium, Ibuprofen and Netopam.

Antihistaminic and antiasthmatic agents

Terfenadine, Cinnarizine, Salbutamol and Beclomethasone dipropionate.

Books Suggested

1. Introduction to medicinal chemistry, A. Gringuage, Wiley-VCH.
2. Wilson and Gisvold's Text Book of Organic Medicinal and Pharmaceutial Chemistry, Ed. Robert F. Dorge.
3. An Introduction to Drug Design, S.S. Pandeya and J. R. Dimmock, New Age International.
4. Burger's Medicinal Chemistry and Drug Discovery, Vol-I (Chapter 9 and Chapter 14), Ed. M.E. Wolff, John Wiley.
5. Goodman and Gilman's Pharmacoloical Basis of Therapeutics, Mc-GRaw- Hill.
6. The organic Chemistry of Drug Design and Drug Action, R.B. Silverman, Academic Press.
7. Strategies for Organic Drug Synthesis and Design, D.Ledinicer, John Wiley.
8. Principals of Medicinal Chemistry W.O. Foye.
9. Medicinal Chemistry; The role of organic chemist in Drug Research, S.M. Roberts and B. J. Pricer.

COURSE OUTCOMES

- Understand Drug metabolism and mechanism pathway.
- Recognize and comment on different synthetic strategies and methods for stereocontrol when faced with synthetic drugs.
- Understood different system of human body. Application of drug molecules.
- To learn theories and principle related to medicinal chemistry.

SEMESTER –III
PRACTICAL
(Duration: 6-8 hrs in each branch)

Inorganic Chemistry

COURSE OBJECTIVES

The students will learn

- Separation of metals using chromatographic techniques.
- Complexometric titration.
- Estimation of Ca^{2+}, Mg^{2+} and Zn^{2+} using flame photometers.

Experiment - 1	15
Experiment -2	15
Viva Voce	10
Record	10
Total	**50**

1. **Chromatographic seperations and estimation**
   (a) Paper chromatography-separation of nickel, manganese, cobalt and zinc. Determination of R_f values.
   (b) Separation and estimation of permagnate and dichromate ions by absorption chromatography.
2. **Quantitative analysis**

Estimation of metal complexes by different techniques

a. Cu-EDTA (Volumetrically)
b. Cu-NH_4CNS (Gravimetrically)
c. Ni-DMG (Gravimetrically)
d. Oxalate-$KMnO_4$ (Volumetrically)

3. **Paper chromatography**

Separation of cations by Paper Chromatography of following cations

(a) Ag(I), Pb(II) and Hg_2(II)
(b) Hg(II), Cu(II) and Pb(II)
(c) Ni(II), Co(II) and Zn(II)
(d) Ni(II), Co(II) and Cu(II)

Books Suggested

1. A handbook of Analytical Inorganic Chemistry, International Scientific Publishing Academy, India, 2005.
2. Synthesis and Characterization of Inorganic Compounds, W. L. Jolly, Prentice Hall.
3. Vogel's Textbook of Quantitative Analysis, revised, J. Bassett, R. C. Denney, G. H. Jeffery and J. Mendham, ELBS.
4. A collection of Inorganic General Chemistry Experiments, A. J. Elias, Universities Press, Sangam Books Ltd., 2002.

COURSE OUTCOMES

The students will be able to

- Separate metals using chromatographic techniques.
- Estimate metal ions complexometrically.
- Estimate metals using flame photometric.

Physical Chemistry

COURSE OBJECTIVES

To introduce experiments in chemical kinetics and equivalent conductivity.

Experiment - 1	15
Experiment -2	15
Viva Voce	10
Record	10
Total	**50**

1. **Chemical Kinetics (determination of strength of two acids)**

(a) Determination of relative strengths of HCl and H_2SO_4 (k_1 / k_2) for the hydrolysis of methyl acetate.
(b) Determination of relative strengths of HNO_3 and H_2SO_4 (k_1 / k_2) for the hydrolysis of methyl acetate.

2. **Determination of Equivalence conductance of following strong electrolyte**
   (a) KCl
   (b) NaCl
   (c) $AgNO_3$
   (d) HCl
   (e) KNO_3

Books Suggested

1. Experimental Physical Chemistry: A. M. Halpern, G. C. McBane and W. H. Freeman, A Laboratory Prescribed Book, 3rd ed., 2006.
2. Senior Practical Physical Chemistry, B. D. Khosla, R. Chand and Co., New Delhi, 2007.
3. Practical Physical Chemistry, A. M. James and F. E. Prichard, Longman.
4. Findley's Practical Physical Chemistry, B. P. Levitt, Longman.

COURSE OUTCOMES

The students will be able to

- Determine the strength of two acids.
- Determine equivalence conductance of electrolytes.
- Calculate different electrochemical parameters.

Organic Chemistry

COURSE OBJECTIVES

The students will learn

- To determine vitamin C in drugs and in fruits.
- To separate and identify the sugars from given mixtures of glucose, fructose and sucrose.
- To interpretate ^{1}H and ^{13}C NMR spectroscopy of known samples.

Experiment - 1	15
Experiment -2	15
Viva Voce	10
Record	10
Total	**50**

1. **Quantitative analysis**

Determination of vitamin C in drug formulations and in fruits.

2. **Paper Chromatography**
   Separation and identification of the sugars present in the given mixture of glucose, fructose and sucrose by paper chromatography and determination of R_F values.

3. **Interpretation of ions of ^{1}H and ^{13}C NMR spectra of known organic compounds.**

Books Suggested

1. The Systematic Identification of Organic Compounds, R. L. Shriner and D. Y. curlin.
2. A Practical text book by Singh and Yadav, Pragati Prakashan.
3. Practical Organic Chemistry, F. G. Mann and B. C. Saunders, Orient Longman.
4. Experiments and techniques in Organic Chemistry, D. Pasto, C. Johnson and M. Miller, Prentice Hall.

COURSE OUTCOMES

Students will be able

- To identify vitamin C.
- To separate and identify the sugars.
- To interpretate the NMR spectra.

SEMESTER –IV
Paper-V
MCH-508: NATURAL PRODUCT

COURSE OBJECTIVES

To provide knowledge on various natural products of biological importance.

Unit-I

Terpenoids and Carotenoids

Calcifications, nomenclature, occurrence, isolation, general methods of structure determination, isoprene rule. Structure determination, stereochemistry, biosynthesis and synthesis of the following representative molecules: Citral, Geraniol α-Terpeneol, Menthol, Farnesol, Zingiberence, Santonin, Phytol, Abietic acid and β-Carotene.

Unit-II

Alkaloids

Definition, nomenclature and physiological action, occurrence, isolation, general methods of structure elucidation, degradation, classification based on nitrogen heterocyclic ring, role of alkaloids in plants. Structure, stereochemistry, synthesis and biosynthesis of the following: Ephedrine, (+)- Coniine, Nicotine, Atropine, Quinine and Morphine.

Unit-III

Steroids

Occurrence, nomenclature, basic skeleton, Diel's hydrocarbon and stereochemistry, Isolation, Structure determination and synthesis of Cholesterol, Bile acids, Androsterone, Testosterone, Estrone, Progesterone, Aldosterone, Biosynthesis of Steroids.

Unit-IV

Plant Pigments

Occurrence, nomenclature and general methods of structure determination. Isolation and synthesis of Apigenin, Luteolin Quercetin, Myrcetin, Quercetin 3-glucoside, Vitexin, Diadzein, Aureusin, Cyanidin-7arabinoside, Cyanidin, Hirsutidin, Biosynthesis of flavonoids: Acetate pathway and Shikimic acid pathway.

Prophyrins

Structure and synthesis of Haemoglobin and Chlorophyll.

Unit V

Prostaglandis

Occurrence, nomenclature, classification, biogenesis and physiological effects. Synthesis of PGE2 and PGF2a.

Pyrethroids and Rotenones

Synthesis and reactions of Pyrethroids and Rotenones. (For structure elucidation, emphasis is to be placed on the use of spectral parameters wherever possible).

Books Suggested

1. Natural Products : Chemistry and Biological Significance, J. Mann, R.S. Davidson, J.B. Hobbs, D.V. Banthrope adn J.B. Harbome, Longman, Esses.
2. Organic Chemistry : Vol. 2 1L. Finar, ELBS
3. Stereoselective Synthesis : A Practical Approach, M. Norgradi, VCH.
4. Rodd's Chemistry of Carbon Compounds, Ed. S. Coffey, Elsevier.
5. Chemistry, Biological and Pharmacological Properties of Medicinal Plants from the Americas, Ed. Kurt Hostettmann, M.P. Gupta and A. Marston. Harwood Academic Publishers.
6. Introduction to Flavonoids, B.A. Bohm. Harwood Academic Publishers.
7. New Trends in Natural Product chemistry, Ataaur Rahman and M.L. Choudhary, Harwood Academic Publishers.
8. Insecticides of Natural Origin, Sukh Dev, Harwood Academic Publishers.

COURSE OUTCOMES

Students will achieve insight on various natural products of biological importance.

SEMESTER –IV
Paper-VI
MCH-509: SOLID STATE CHEMISTRY

COURSE OBJECTIVES

- The students will obtain required knowledge for understanding material science problems. Initially, they will study the structure of solids and get introduced with the importance of chemical and physical bonds, crystal (dis)order and defects for materials properties.
- They will get insight into electronic structure of crystals and compare it with the electronic structure of nanomaterials – to understand the 'nano' prefix.

- The students will understand high temperature phase equilibria and learn thermodynamic and kinetic treatments of phase transitions.

Unit-I
Solid State Reactions
General principles, experimental procedure, co-precipitation as a precursor to solid state reactions, kinetics of solid state reactions.

Unit-II
Crystal Defects and Non-Stoichiometry
Perfect and imperfect crystals, intrinsic and extrinsic defects-point defects, line and plane defects, vacancies-Schottky detects and Frenkel defects. Thermodynamics of Schottky and Frenkel defect formation, colour centres, non-stoichiometry defects.

Unit-III
Electronic Properties and Band Theory
Metals insulators and semiconductors, electronic structure of solid band theory band structure of metals, insulators and semiconductors, Intrinsic and extrinsic semiconductors, doping semiconductors, p-n junctions, super conductors. Optical properties-Application of optical and electron microscopy. Magnetic Properties-Classification of materials : Effect of temperature calculation of magnetic moment, mechanism of ferro and anti ferromagnetic ordering super exchange.

Unit-IV
Organic Solids
Electrically conducting solids. organic charge transfer complex, organic metals, new superconductors.

Unit-V
Liquid Crystals:
Types of liquid crystals: Nematic, Smectic, Ferroelectric, Antiferroelectric, Various theories of LC, Liquid crystal display, New materials.

Books Suggested.

1. Solid state chemistry and its applications, A.R. West, Student Edition Wiley.
2. Principles of the Solid State, H.V. Keer, Wiley Eastern.
3. Solid State Chemistry, N.B. Hannay.
4. Solid State Chemistry, D.K. Chakrabarty, New Wiley Eastern.
5. Solid State Chemistry, S.K. Joshi and R.A. Mashelker, World Scientific, Singapore.

COURSE OUTCOMES

To obtain the knowledge on design and development of materials with pre-required properties based on understanding the structure of solids in its influence on physico-chemical properties, understanding of phase relations, chemical synthesis, reaction kinetics as well as characterization methods.

SEMESTER –IV
DISCIPLINE ELECTIVE
Paper VII
MCH-510: Analytical Chemistry

COURSE OBJECTIVES

The objective of this course is

- To study concepts and theories behind basic methods and techniques used in analytical chemistry. This theory can be used to solve many rigorous problems of universe.

- To prepare the students for further research in analytical methods of chemistry.

Unit-I

Introduction

Role of analytical chemistry Classification of analytical methods classical and instrumental. Types of instrumental analysis. Selecting an analytical method. Neatness and cleanliness. laboratory operations and practices. Analytical balance. Techniques of weighing, errors. Volumetric glassware cleaning and calibration of glassware. Sample Volumetric glassware cleaning and Calibration of glassware. Sample preparationdissolution and decompositions. Gravimetric techniques. Selecting and handling or reagents. Laboratory notebooks. Safety in the analytical laboratory.

Errors and Evaluation

Definition of terms in mean and median. Precision-standard deviation, relative standard deviation. Accuracy-absolute error, relative error. Types of error in experimental data determinate (systematic), indeterminate (or random) and gross. Sources of error and the effects upon the analytical results. Methods for reporting analytical data. Statistical evaluation of data-indeterminate errors. The uses of statistics.

Unit-II

Food analysis

Moisture, ash, crude protein, fat crude fiber, carbohydrates, calcium, potassium, sodium and phosphate. Food adulteration-common adulterants in food, contamination of foods stuffs. Microscopic examination of foods for adulterants. Pesticide analysis in food prodcuts. Extraction and purification of sample. HPLC. Gas chromatography for organophosphates. Thin-layer chromatography for identification of chlorinated pesticides in food products.

Unit-III

Analysis of Water Pollution

Origin of Waste water, types, water pollutants and their effects. Sources of water pollution-domestic, industrial, agricultural soil and radioactive wastes as sources of pollution. Objectives of analysis-parameter for analysis-colour, turbidity, total solids, conductivity, acidity, alakalinity, hardness, chloride, sulphate, fluoride, silica, phosphates and different forms of nitrogen, Heavy metal pollution-public health significance of cadmium, chromium, copper, lead, zinc, managanese, mercurry and arsenic. General survey of instrumental technique for the analysis of heavy metals in aqueous systems. Measurements of DO, BOD, and COD. Pesticides as water pollutants and analysis. Water pollution laws and standards.

Unit-IV

Analysis of soil, Fuel, Body Fluids and Drugs

Analysis of Soil, moisture pH total nitrogen, phosphorus, silica, lime, magnesia, manganese, sulphur and alkali salts.

Fuel analysis : liquid and gas. Ultimate and proximate analysis-heating valuesgrading of coal. Liquid fuels-flash point, aniline point, octane number and carbon residue. Gaseous fuels-produced gas and water gas-calorific value.

Unit-V

Clinical Chemistry and Drug analysis

Composition of blood-collection and preservation of samples. Clinical analysis. Serum electrolytes, blood glucose, blood urea nitrogen, uric acid, albumin, globulins, barbiturates, acid and alkaline phosphates. Immunoassay: principles of radio immunoassay (RIA) and applications. The blood gas analysis trace elements n the body. Narcotics and dangerous drug. Classification of drugs. Screening by gas and thin-layer chromatography and spectrophotometeric measurements.

Books Suggested

1. Analytical Chemistry, G.D. Christian, J.Wicy.
2. Fundamentals o analytical Chemistry. D.A. Skoog. D.M. West and F.J. Hooler, W.B. Saunders.

3. Analytical Chemistry-Principles. J.H. Kennedy. W.B. Saunders.
4. Analytical Chemistry-Principles and Techniques. LG. Hargis. Prentice Hall.
5. Principles of Instrumental analysis D.A. Skoog and J.L. Loary, W.B. Saunders.
6. Principles of Instrumental Analysis D.A. Skoog W.B. Saunders.
7. Quantitative Analysis, R.A. Day, Jr. and A.L. Underwood, Prentice Hall.
8. Environmental Solution, S.M. Khopkar, Wiley Eastern.
9. Basic Concepts of Analysis Chemistry, S.M. Khopkar, Wiley Eastern.
10. Handbook of Instrumental Techniques for Analytical Chemistry, F. Settle, Prentice Hall.

COURSE OUTCOMES

After studying this course the student will be able to

- Understand the basic of this course and think & develop new ideas and concepts in analytical chemistry.
- Know about electroanayltical, thermoanalytical, radiochemical, chromatographic and spectral techniques.

SEMESTER –IV
DISCIPLINE ELECTIVE
Paper VII
MCH-511: Organic Synthesis

COURSE OBJECTIVES

To provide the knowledge on

- Advances in organic synthesis- applications of selective name reactions and catalysts used in synthetic organic laboratories.
- Cover wide area of research in organic chemistry.

Unit-I

Disconnection Approach

An introduction to synthons and synthetic equivalents. Disconnection approach, functional group inter-conversions, the importance of the order of events in organic synthesis, one group C-X and two group C-X disconnections, chemoselectivity, reversal of polarity, cyclisation reaction, amine synthesis, Protection of groups, chemo region and stereo selectivity.

Unit-II

One Group C-C Disconnections

Alcohols and carbonyl compounds, regioselectivity, alkene synthesis, use of acetylenes and aliphatic Nitro compounds in organic synthesis.

Two Group C-C Disconnections

Diels-Alder Reaction, 1,3-difunctionalised compounds, a-b- unsaturated carbonyl compounds, control in carbonyl condensations, 1,5-difunctionalised compounds. Micheal addition and Robinson annelation.

Unit-III

Oxidation

Introduction, Different oxidative processes. Hydrocarbons-alkenes, aromatic rings, saturated C-H groups (activated and unactivated) Alcohols, diols, aldehyde's, ketones, ketals and carboxylic acids, amines, hydrazines, and sulphides. Oxidations with ruthenium tetraoxide, iodobenzene diacetate and thallium. (III) Nitrate.

Reduction

Introduction, Different reductive processes. Alkanes, alkenes, alkynes, and aromatic rings. Carbonyl compounds-aldehydes, ketones, acids and their derivatives. Epoxides. Nitro, nitroso, azo and oxime groups. Expoxide, Nitro, Nitroso, azo and oxime groups. Hydrogenolysis.

Unit IV

Organometallic Reagents

Principle, preparations, properties and applications of the following in organic synthesis with mechanistic details. Group I and II metal organic compounds Li, Mg, Hg, Cd, Zn and Ce Compounds.

Unit V

Synthesis of some complex molecules

Application of the above in the synthesis of following compounds: Canphor, longifoline, cartisone, reserpine, vitamin D, juvabion, aphidicolin and fredericamycin. A

Books Suggested

1. Designing Organic Synthesis, S. Warren. Wiley.
2. Organic Synthesis-Concept, Methods and Starting Materials, J. Fuhrhop.
3. Some Modern Methods of Organic Synthesis. W. carruthers, Cambridge Univ. Press.
4. Modern Synthetic Reactions H.O. House, W.A Benjamin.
5. Advanced Organic Chemistry : Reactions, Mechanisms and Structure, J. March. Wiley.
6. Principles, of Organic Chemistry Part B. F.a. Carey and R.J. Sundberg, Plenum Press.

COURSE OUTCOMES

Organic synthesis– reactions and catalysts is the backbone of organic chemistry and will train students to develop ideas for further research in the field of synthetic organic chemistry.

SEMESTER –IV
DISCIPLINE ELECTIVE
Paper VII
MCH-512: Polymers

COURSE OBJECTIVES

To make the student conversant with the

- Basic concepts of polymers, molecular weight and its distribution.
- Kinetics and mechanism of Addition, Coordination and Condensation polymerization.
- Various polymerization techniques.
- Various mechanical and electrical testing methods.
- Effect of polymer structure on mechanical, electrical and optical properties.

Unit-I

Basics

Importance of polymers. Basic concepts : Monomers, repeat units, degree of polymerization Linear, branched and network polymers. Classification of polymers. Polymerization: condensation, addition/radical chain-ionic and co-ordination and copolymerization. Polymerization conditions and polymer reactions. Polymerization in homogeneous and heterogeneous systems.

Unit-II

Polymer Characterization

Polydispersion-average molecular weight concept. Number, weight and viscosity average molecular weights. Polydispersity and molecular weight distribution. The practical significance of molecular weight. Measurement of molecular-weights. End-group, viscosity, light scattering, osmotic and ultracentrifugation methods.

Unit-III

Analysis and testing of polymers

Chemical analysis of polymers, spectroscopic methods, X-ray diffraction study. Microscopy. Thermal analysis and physical testing-tensile strength. Fatigue, impact. Tear resistance, Hardness and abrasion resistance.

Unit-IV

Inorganic Polymers

A general survey and scope of Inorganic Polymers special characteristics, classification, homo and hetero atomic polymers. Structure, Properties and Applications of

a. Polymers based on boron-borazines, boranes and carboranes.
b. Polymers based on Silicon, silicone's polymetalloxanes and polymetallosiloxanes, silazanes.

Unit V

Structure, Properties and Application of

a. Polymers based on Phosphorous-Phosphazenes, Polyphosphates
b. Polymers based on Sulphure-Tetrasulphur tetranitride and related compounds.
c. Co-ordination and metal chelate polymers.

Books Suggested

1. Inorganic Chemistry, J.E. Huheey, Harper Row.
2. Developments in Inorganic polymer Chemistry, M.F. Lappert and G.J. Leigh.
3. Inorganic polymers- N.H. Ray.
4. Inorganic polymers, Graham and Stone.
5. Inorganic Rings and Cages : D.A. Armitage.
6. Textbook of Polymers Science, F.W. Billmeyer Jr. Wiley.
7. Contemporary Polymer Chemistry, H.R. Al cock and F.W. Lambe, Prentice Hall.

COURSE OUTCOMES

- The students will become familiar with the basic concepts of polymers, mechanism and kinetics of polymerization, polymerization techniques and molecular weight determination.
- This knowledge would help the students to synthesize polymers and mechanism involved in it.
- It will enable the students to interpret their experimental data using the characterization techniques and structure-property relationship for their final semester research project.

SEMESTER –IV
GENERIC ELECTIVE
Paper VIII
MCH-513: ENVIRONMENTAL CHEMISTRY

COURSE OBJECTIVES

Objective f this course is

- To provide the systematic study of Atmospheric and Tropospheric Photochemistry.

- To help in understanding the causes of environmental pollution and can open up new methods for environmental pollution control.
- To make the students to learn about the environmental ecosystem, waste water handling and analysis.

Unit-I

Atmospheric Chemistry

Atmospheric layers, Vertical temperature profile, heat/radiation budget of the earth atmosphere systems. Properties of troposphere, thermodynamic derivation of lapse rate. Temperature inversion. Calculation of Global mean temperature of the atmosphere. Pressure variation in atmosphere and scale height. Biogeochemical cycles of carbon, nitrogen, sulphure, phosphorus oxygen. Residence times. Sources of trace atmospheric constituents: nitrogen oxides, sulphuredioxide and other sulphure compounds, carbondioxides, chlorofluorocarbons and other halogen compounds, methane and other hydrocarbons.

Tropospheric Photochemistry

Mechanism of Photochemical decomposition of NO_2 and formation of ozone. Formation of oxygen atoms, hydroxyl, hydroperoxy and organic radicals and hydrogen peroxide. Reactions of hydroxyl radicals with methane and other organic compounds. Reaction of OH radicals with SO_2 and NO_2. Formation of Nitrate radical and its reactions. Photochemical smog meteorological conditions and chemistry of its formation.

Unit-II

Air Pollution

Air pollutants and their classifications. Aerosols-sources, size distribution and effect on visibility, climate and health.

Acid Rain

Definition, Acid rain precursors and their aqueous and gas phase atmospheric Oxidation reactions. Damaging effects on aquatic life, plants, buildings and health. Monitoring of SO_2 and NO_2. Acid rain control strategies.

Stratospheric Ozone Depletion

Mechanism of Ozone formation, Mechanism of catalytic ozone depletion, Discovery of Antarctic Ozone hole and Role of chemistry and meteorology. Control Strategies.

Green House Effect

Terrestrial and solar radiation Spectra, Major green house gases and their sources and Global warming potentials. Climate change and consequences.

Urban Air Pollution

Exhaust emissions, damaging effects of carbon monoxide. Monitoring of CO. Control strategies.

Unit-III

Aquatic Chemistry and Water Pollution

Redox chemistry in natural waters. Dissolved oxygen, biological oxygen demand, chemical oxygen demand, determination of DO, BOD and COD. Aerobic and anaerobic reactions of organic sulphure and nitrogen compounds in water acid-base chemistry of fresh water and sea water. Aluminum, nitrate and fluoride in water. Petrification. Sources of water pollution. Treatment of waste and sewage. Purification of drinking water, techniques of purification and disinfection.

Unit IV Environmental Toxicology

Toxic heavy metals

Mercury, lead, arsenic and cadmium. Causes of toxicity. Bioaccumulation, sources of heavy metals. Chemical speciation of Hg, Pb, As, and Cd. Biochemical and damaging effects.

Toxic Organic Compound
Pesticides, classification, properties and uses of organochlorine and ionospheres pesticides detection and damaging effects.

Polychlorinated biphenyls
Properties, use and environmental continuation and effects.

Polynuclear Aromatic Hydrocarbons
Source, structures and as pollutants.

Unit-V
Soil and Environmental Disasters
Soil composition, micro and macronutrients, soil pollution by fertilizers, plastic an metals. Methods of re-mediation of soil. Bhopal gas tragedy, Chernobyl, three mile island, Minimtata Disease, Sevoso (Italy), London smog.

Books Suggested

1. Environmental Chemistry, Colin Baird, W.H. Freeman Co. New York, 1998.
2. Chemistry of Atmospheres, R.P. Wayne, Oxford.
3. Environment Chemistry, A.K. De, Wiley Eastern, 2004.
4. Environmental Chemistry, S.E. Manahan, Lewis Publishers.
5. Introduction to atmospheric Chemistry, P.V. Hobbs, Cambridge.

COURSE OUTCOMES

- Students will be able to have applied understanding of Atmospheric and Tropospheric Photochemistry.
- Students understanding the principles of water and air analysis.
- The course is also useful in understanding various aspects of Environmental Toxicology and Environmental Disasters.

SEMESTER –IV
GENERIC ELECTIVE
Paper VIII
MCH-514: COMPOTER-AIDED DRUG DISCOVRY

COURSE OBJECTIVES

The objective of this course is

- To provide theoretical knowledge about the use of computer in drug discovery.
- To understand the correlation of drug activity with structure of molecules.
- To understand the statistical tools applicable in Hansch analysis and regression analysis.
- Theoretically understanding the drug interaction with receptor.

Unit I
General information about drugs
Measuring drug activity, drug absorption, lipophilicity, pharmacokinetics factors, distribution of drugs, protein binding of drugs. Rational approaches to lead Discovery based on traditional medicine random screening non random screening lead Discovery based on drug metabolism and clinical observation.

Unit II
SAR vs Quantitative Structure-Activity Relationship

History and development of USA yaar types of physical chemical parameters experimental and theoretical approaches for the determination of physical chemical parameters such as partition Coefficient and its substitution constant and taps study constant hansch analysis free Wilson analysis 3D, QSAR approaches like COMFA and COMSIA.

Unit III

Topological modeling

Molecular graphs, atom connectivity, different types of matrices: distance matrix, adjacency matrix, Deutore matrix, Randic Connectivity indices, Kier and Hall valence connectivity indices Wiener index, Path Numbers, Sz index, Sadhana index, PI index , Balaban index for simple molecules : Derivatives of Benzene, Biphenyl, Quinolines, Acridines etc.

Unit IV

Regression analysis

Statistical parameters: R, F, SE, Pogliani quality factor, testing of models, Cross validation parameters, univariate and multivariate modelling. Computer softwares for modeling, Degree of freedom, de novo constants. Outliers.

Virtual screening techniques drug like Ne screaming concept of pharmacophore mapping and pharmacophore based screening molecular Docking

Unit V

Molecular Modeling

Introduction to molecular mechanics energy minimization methods and conformational analysis Global conformational minima determination introduction to bioinformatics kemo Informatics. Introduction to bioinformatics chemoinformatics.

Books Suggested

1. Medicinal chemistry: ASHUTOSH KAR, New Age International Publishers New Age International Publishers.
2. Medicinal chemistry and drug discovery, M.E. Wolf, John Wiley and Sons, NY.
3. Burgers Med. chemistry and drug discovery 6th Edition, John Wiley, New York.
4. Qualitative Structure Activity Relationship in Drug Design Vol I,C. Hanch, Academic Press,
5. Molecular Connectivity in Chemistry and Drug Research, L.B. Kier, L.H. Hall, Academic Press. London.
6. Quantitative Aspects of Chemical Pharmacology, R.B. Barlow, Vroom Helm, London.
7. Principles of Organic Medicinal Chemistry , Ramarao, Bande ndls, New Age International P Ltd,
8. Graph Theory and Topology in Chemistry, Ed. R. B. King and D.H. Roury, Elsevier Sc. Publishers. AMSTERDAM.
9. Topological indices and Related Descriptors in QSAR and QSPR, James Defilers, CTC Press, 2000.
10. Sadhana Index in Nanotechnology, Khadi kar, Agrawal, Aziz, Lambert, Amazon.

COURSE OUTCOMES

After studying the course, the students will be able to

- Calculate various indices (Physicochemical Topological) for obtaining models for predicting the biological activities of new molecules.
- Learn the statistical methods and tools.
- Perform 3Q QSAR and docking which will help in selecting new functional groups for belle activity.
- Work in pharmacy industries for developing new drugs by way of QSAR.

SEMESTER –IV

PRACTICAL

(Duration: 6 hrs in each branch)

Inorganic Chemistry

COURSE OBJECTIVES

The students will learn

- Quantitative determination of different metal ions.
- Synthesis and characterization of metal complexes.

Experiment - 1	15
Experiment -2	15
Viva Voce	10
Record	10
Total	**50**

1. **Quantitative determinations of metal ions from three component mixture**
   One volumetrically and two gravimetrically
   (a) Cu^{+2}, Ni^{+2}, Zn^{+2}
   (b) Cu^{+2}, Ni^{+2}, Ag^{+2}
   (c) Cu^{+2}, Ni^{+2}, Ba^{+2}

2. **Synthesis and characterization of following metal complexes**
   (a) Sodium tetrathionate $Na_2S_4O_6$
   (b) Metal complex of dimethyl sulfoxide: $CuCl_2.2DMSO$
   (c) Synthesis of metal acetylacetonate
   (d) Synthesis of copper and nickel Schiff base complexes
   (e) Synthesis of copper and nickel dithiocarbamates

Books Suggested

1. Synthesis and characterization of Inorganic Compounds, W. L. Jolly, Prentice Hall.
2. A Handbook of Analytical Inorganic Chemistry, D. Sharma, International Scientific Publishing Academy, India, 2005.
3. A collection of Interesting General Chemistry Experiments, A. J. Elias, Universities Press, Sangam Books Ltd., 2002.
4. Vogel's Textbook of Quantitative Analysis, revised, J. Bassett, R. C. Denney, G. H. Jeffery and J. Mendham, ELBS.

COURSE OUTCOMES

The students will be able to

- Determine the metal ions from a three component mixture.
- Synthesis and characterize the metal complexes.

Physical Chemistry

COURSE OBJECTIVES

The students will learn

- Identification and determination of $E_{1/2}$ of compounds.
- Determination of pK value of indicators and stability of Iron complex.

Experiment - 1	15
Experiment -2	15
Viva Voce	10
Record	10
Total	**50**

1. **Electrochemistry**
   (a) Identification and estimation of metal ions such as Cd^{2+}, Pb^{2+}, Zn^{2+} and I^{2+} etc. polarographically.
   (b) Study of a metal ligand complex polarographically (using Lingane's method).

2. **Spectroscopy**
   (a) Determination of pK_a of an indicator (e.g. methyl red) in (a) aqueous and (b) micellar Media.
   (b) Determination of stoichiometry and stability constant of Ferric isothiocyanate ion complex in solution.

Books Suggested

1. Experimental Physical Chemistry, R. C. Das and B. Behera, Tata McGraw Hill.
2. Practical Physical Chemistry, A. M. James and F. E. Prichard, Longman.
3. Experimental Physical Chemistry: A Laboratory Prescribed Book, A. M. Halpern, G. C. McBane and W. H. Freeman, 3rd ed., 2006.
4. Experimental Physical Chemistry, V. D. Athawale, New Age International, 2007.

COURSE OUTCOMES

The students will be able to

- Identify and estimate the polarograms.
- Determine pK value of indicator and stability of Iron complex.

Organic Chemistry

COURSE OBJECTIVES

Students will learn

- Multistep synthesis of organic compounds.
- Isolation of compounds from natural products.

Experiment - 1	15
Experiment -2	15
Viva Voce	10
Record	10
Total	**50**

1. **Multi-step Synthesis of Organic Compounds**
   The exercise should illustrate the use of organic reagents and may involve purification of the products by chromatographic techniques. Prepreparation in steps: Benzophenone →Benzpinacol→Benzpinacolone Beckmann rearrangement : Benzanilide from benzene, Benzene →Benzophenone →Benzphenone oxime→ Benzanilide, Benzilic acid rearrangement : Benzilic acid from benzoin, Benzoin→Benzil→Benzilic acid Synthesis of heterocyclic compounds Skraup synthesis : Preparation of quinoline from aniline, Fisher Indole synthesis : Preparation of 2-phenylindole from phenylhydrazine, Enzymatic synthesis Enzymatic synthesis Enzymatic reduction : reduction of ethyl acetoacetate using Baker's yeast to yield enantiomeric excess of S (+) ehtyl-3-hydroxybutanoate and determine its optical purity. Biosynthesis of ethanol from sucrose. Synthesis using microwave Alkylation of diethyl malonate with benzyl chloride. Synthesis using phase transfer catalyst. Alkylation of diethyl malonate or ethyl acetoacetate with an alkylhalide.

2. **Isolation**
   (a) Isolation of caffeine from tea leaves.
   (b) Isolation of casein from milk (the students are required to try some typical colour reactions of proteins).
   (c) Isolation of lactose from milk (purity of sugar should be checked by LC and PC and Rf values reported).
   (d) Isolation of nicotine dipicrate from tobacco.
   (e) Isolation of piperine from black pepper.
   (f) Isolation of lycopene from tomatoes.
   (g) Isolation of b-carotene from carrots.
   (h) Isolation of eugenol from clove.
   (i) Isolation of (+) limonine from citrus rind

Books Suggested

1. The systematic Identification of Organic Compounds, R.L. Shriner and D.Y. curlin.
2. A Practical text book by Singh and Yadav, Pragati prakashan.
3. Vogel's Textbook of Practical Organic Chemistry, ELBS.
4. Macroscale and Microscale Organic Experiments, K. L. Williamson and D. C. Heath.

COURSE OUTCOMES

Students will gain knowledge of

- Multistep organic synthesis.
- Isolation of compound from natural products.

STUDY CENTRE FOR BIOCHEMISTRY

DEPARTMENT OF CHEMISTRY

COURSE STRUCTURE

for

(M.Sc. Biochemistry)
Four Semesters (Two Year)

Programme

Based on

Choice Based Credit System (CBCS)
(As per Ordinance-14)

I & II Semester 2020-21
III & IV Semester 2021-22

AWADHESH PRATAP SINGH UNIVERSITY, REWA (M.P.)

Semester Course of M.Sc. Biochemistry

Programme : M.Sc. Biochemistry
Programme Code : 78
Duration : 4 Semester (Two Year)

BIOCHEMISTRY PROGRAM GOALS

The syllabus strengthens to acquire an advanced knowledge and understanding of the core principles of Biochemistry.

1. To provide specific knowledge the fundamental chemical principles that governs complex biological systems.

2. Biochemistry relate to the biological aspects of scientific reasoning and biochemical analytical problem solving with a cellular, molecular, enzymatic, immunological, genetically and clinical based perspective.

3. To provide students with the skills required to succeed, the pharma, biochemical, agriculture industry, pathological, hospital and medical based organization research and professional.

4. To obtain knowledge in Pharmaceutical, Microbial and Industrial Biochemistry.

5. To expose the students to a breadth of experimental techniques using modern bioinstrumentation.

6. To prepare candidates for a career in Pharmaceutical industries, food industries, health and academic etc.

LEARNING OBJECTIVES

1. Student will learn the broad knowledge and a solid foundation in biology and chemistry.
2. The student will understand the advance knowledge of Clinical biochemistry, industrial biochemistry, Molecular genetics principles, nature of chemical reactions and health related problems.

3. Student will develop analytical and critical-thinking skills that allow independent exploration of biological phenomena through the scientific method.

4. To introduce students to modern methods of biochemical experimentation within the disciplines of biology and chemistry.

5. The student will understand the interdisciplinary nature of biochemistry and to integrate knowledge of chemistry, physics and other disciplines to a wide variety of biochemical issues for industries, product development and quality control.

6. The student will learn the practical based laboratory skills needed to design, safely conduct and interpret biochemical research.

7. The student will acquire a foundation of biological chemistry of sufficient breadth and depth to enable them to understand and critically interpret the advance chemical literature.

8. The student will develop the ability to effectively communicate scientific information and research results in written and oral formats.

9. The student will learn professionalism, including the ability to work in teams and apply basic ethical principles in life and profession. He/She will understand how to interpret the results and apply them in solving the problems.

Department of Biochemistry
Awadhesh Pratap Singh University, Rewa (M.P.).
(Course Structure and Scheme of Examination)

M. Sc. Biochemistry (Four Semester Choice Based Credit System CBCS Syllabus).
(Total 96 credits)

- M.Sc. Biochemistry is a post-graduate regular course for duration of 2 years. This course contains 4 semesters of study. Semester program based on the Choice Based Credit System (CBCS), Syllabus contents having potential academic, research and development expected outcomes. This course contains a fusion of biology and chemistry which helps students to understand the chemical process related to the living organisms.

- A candidate with a minimum of 50% in a bachelor's degree in the relevant field of study is eligible to gain admission to this course. A candidate who is successful in completing this degree gets a wide range of job availability in the government, public and private sector. Programme support to learner for their better carrier development with personal behavioral competence, critical thinking to resolve the subject concern issues. Program also support to learner/ students in creation of better platform for carrier aspects in expansion of self employment.

Program Outcomes (PO)

The following outcome reflects the terminal skills that all master post graduate should be able to demonstrate program completion.

(PO1): Disciplinary knowledge and understanding

- Disciplinary knowledge and understanding of biochemistry expressed as, structure and function of biological molecules. By the end of four semesters of M.Sc. Biochemistry, students will gain the breadth and depth of scientific knowledge in 'Biochemistry' and allied areas.

(PO2): Critical thinking, Personal and Behavioral Competence with effective Communication

- Students will be able to demonstrate an experiential learning and critical thinking with problem solving abilities. Students will be able to generate ideas for research, analyze them and execute them. Demonstrate self-direction and originality in tackling and solving problems, and act autonomously in planning and implementing tasks at a professional or equivalent level.

(PO3): Basic professional skills

- Basic professional skills pertaining to biochemical analysis, carrying out clinical diagnostic tests and gain the ability to use skills in specific areas related to biochemistry such as drug discovery , development, food quality testing, industrial production, clinical, Nutrition, drug certification, licensing, regulatory affairs, forensic investigation, health care etc.

- Students will develop the ability for articulation of ideas, scientific writing and authentic reporting, effective presentation skills. Also they will learn conversational competence including communication and effective interaction with others, listening, speaking, and observational skills.

(PO4): Social Competence, Self directed and Continuous learning:

- They will be able to plan and manage projects in order to achieve objectives along with ability to work in a group or community. They will be able to recognize the need for continuous up gradation of their knowledge and skills for continuing professional development.

M.Sc. Biochemistry
Program Specific Outcomes (PSO)

PSO1: Obtain essential knowledge and skills to pursue a career in research, industry and in academic set up.

PSO2: Apply the understanding of experimental approaches to solve problems and will have an ability to implement solution to new problems.

PSO3: Integrate and apply the techniques in Analytical biochemistry, Clinical biochemistry, Microbiology, Molecular biology and Bioinformatics.

PSO4: Evaluate the depth of scientific knowledge in the broad range of fields including Cell biology, Metabolism, Pharmaceutical Biochemistry, Genetics, Nutritional Biochemistry, Immunology and Enzymology.

PSO5: Describe and express the biochemical basis of human diseases, protein structure and conformation, non-invasive diagnostics, biochemical pathway regulation and drug development and synthesize this knowledge and apply the same for multitude of laboratory applications.

Eligibility: Graduation with Chemistry, Biotechnology, Microbiology and Biochemistry as a subject.

Age Limit: No age limit.

Admission Procedure: The admission will be done as per merit of qualifying examinations.

Vision of the University

To be the premier institution that offers teaching and learning programmes of the best quality, graduate students who excel and become leaders in the chosen profession contributing to the community, the nation and the world, and prepares individuals of the highest moral fibre. The vision of university is:

To create an ideal society and an intellectual environment that initiates, nourishes and perpetuates values of co-existence and to fulfill and achieve excellence. The university, under the dynamic leadership of our honorable Vice-chancellor is working on quite a few ambitious plans. The idea is to develop the university as a knowledge city.

M.Sc. BIOCHEMISTRY
(FOUR SEMESTER COURSE)
SCHEME OF EXAMINATION
(CBCS Syllabus)
(Effective from 2020-21)

Semester-I

Paper	Course Code	Title of the Paper	Credit	Marks
Paper I	BCH-101	Bio-organic Chemistry	4	100(60+40)
Paper II	BCH-102	Cell Biology	4	100(60+40
Paper III	BCH-103	Human Physiology and Endocrinology	4	100(60+40
Paper IV (Generic Elective)	BCH-104	Biophysical Chemistry & Techniques	4	100(60+40)
Practical (Lab I + Lab II)			4	100(50+50
Comprehensive Viva Voce			4*	
Total			**24**	**600**

*Virtual Credit

Semester-II

Paper	Course Code	Title of the Paper	Credits	Marks
Paper I	BCH-201	Enzymology	4	100(60+40)
Paper II	BCH-202	Microbial Biochemistry	4	100(60+40)
Paper III	BCH-203	Molecular Biology	4	100(60+40)
Paper IV (Generic Elective)	BCH-204	Bio statistics and Computational Bioinformatics	4	100(60+40)
Practical (Lab I + Lab II)			4	100(50+50)
Comprehensive Viva Voce			4*	
Total			**24**	**600**

*Virtual Credit

Semester-III

Paper	Course Code	Title of the Paper	Credits	Marks
Paper I	BCH-301	Metabolism and Plant Biochemistry	4	100(60+40)
Paper II	BCH-302	Immunology	4	100(60+40)
Paper III (Discipline Elective)	BCH-303	Clinical Biochemistry	4	100(60+40)
Paper IV (Generic Elective)	BCH-304	Genetic Engineering	4	100(60+40)
Practical (Lab I + Lab II)			4	100(50+50)
Comprehensive Viva Voce			4*	
Total			**24**	**600**

*Virtual Credit

Semester-IV

Paper	Course Code	Title of the Paper	Credits	Marks
Paper I	BCH-401	Pharmaceutical Biochemistry	4	100(60+40)
Paper II	BCH-402	Biochemical Toxicology and Clinical Research	4	100(60+40)
Paper III (Discipline Elective)	BCH-403	Food and Nutrition Biochemistry	4	100(60+40)
Paper IV (Generic Elective)	BCH-404	Industrial Biochemistry	4	100(60+40)
Practical (Lab I + Lab II)			4	100(50+50
Comprehensive Viva Voce			4*	
Total			**24**	**600**

*Virtual Credit

Grand Total Marks M.Sc. (Ist to IVth Sem) = **2400**

M.Sc. BIOCHEMISTRY
Semester-I
Paper-I
BCH-101: Bio-organic Chemistry

COURSE OBJECTIVES
The objective of this paper is to provide students with a basic understanding of

- The physical and chemical properties of the components of living things.
- The principles of bioenergetics.
- Structural, chemical biology and three-dimensional construction of macromolecules (carbohydrates, proteins, nucleic acids and lipids).
- Functional properties and importance of carbohydrates, proteins, nucleic acids and lipids.

UNIT-I
Carbohydrate- Occurance, Classification, structures, propertise, and biological importance of mono, oligo and polysaccharide, stereo isomerism, optical isomerism and reaction of aldehyde and ketone groups of sugars, mutarotation, ring structure of mono saccharides.

UNIT-II
Lipids- Definition and classification, structure, properties of fatty acids and prostaglandins, claasification distribution and biological importance of fats, waxes compound and derived lipids, physical and chemical properties of fats, steroids, cholesterol and bile acids, characterization of fats.

UNIT-III
Proteins- Introduction, classification and properties of amino acids, Biologically active peptides, classification based on solubility, shape composition and function structure and properties of peptide and proteins. Protection and deprotection of N-terminal and C-terminal ends functional groups in the side. Chain denaturation and Renaturation of protein. Determination of amino and sequences of a polypeptide chain.

UNIT-IV
Nucleic acid- Nature of genetic material, evidances that DNA is the genetic materical, Structure & constitution of nucleic acids (purines, pyrimidines, nucleoside) features of double helix DNA, structure, types, composition, of RNA &DNA, biological role of DNA & RNA. Nucleoproteins, central degma of molecular biology.

UNIT-V
Porphyrins- Porphyrins Nucleus and classification of Porphyrins. Important meiallophyrines. Biosynthesis and degradation of porphyrins. Bile pigments chemical nature and their physiological significance.

Books Suggested

1. Biochemistry by L. Stryer, W.H. Freeman and Co. 5th 2002.
2. Fundamentals of Biochemistry by Voet and Voet, John Wiley and sons NY (2002).
3. Lehninger's Principle of Biochemistry by David L. Nelson and Michael M. Cox. W. H. Freeman; 4th edition (2004).
4. Text Book of Biochemistry with clinical correlation by Thomas .M. Devlin, John Wiley-Liss, Hobokhen N. J. publishers (2006).
5. Biochemistry by Zubey, GL WCB Publishers.

COURSE OUTCOMES

- To understand the concepts of preparation of buffers, molarity, normality, ionization, molality.
- The understanding of different types of chemical bonding, molecular machinery of living cells, principles that govern the structures of macromolecules and their participation in living system.

- To identify with the classification and structural properties of carbohydrates, proteins, nucleic acids and lipids, glycoproteins and glycolipids and their significance in biological systems.
- By the end of the course, the students will be able to demonstrate advanced knowledge and understanding of aspects of physical and chemical properties of aqueous solutions, concepts of free energy.

M.Sc. BIOCHEMISTRY
Semester – I
Paper-II
BCH-102: Cell Biology

COURSE OBJECTIVES

- To equip students with a basic knowledge of the structural and functional properties of cells
- To examine properties of differentiated cell systems and tissues.
- Aspect of cell cycle and cell death.
- To introduce the fascinating mechanism of cell signaling along with brief overview on developmental biology.
- To provide thorough knowledge on classical genetics.

UNIT-I

Cell, cell wall and Extracellular Matrix (ECM), composition, cellular dimensions, Evolution, Organisation, differentiation of prokaryotic and Eukaryotic cells, Virus, bacteria, cyanobacteria, mycoplasma and prions.

UNIT-II

Molecular organisation and biogenesis and functin Mitochondria, endoplasmic reticulam, golgi apparatus, plastids chloroplast, Leucoplast, centrosome, lysosome, ribosome, peroxisome, Nucleus and nucleolus. Endo membrane system, concept of compartmentalization.

UNIT-III

Bio-membrane Transport- Physiochemical propertise of cell membranes. Molecular constitute of membranes, asymmetrical organisation of lipids and proteins. Solute transport across membrane's-fick's law, simple diffusion, passive-facilitated Diffusion, active transport- primary and secondary group translocation, transport ATPases, Membrane transport in bacteria and animals Transport mechanism- mobile carriers and pores mechanisms. Transport by vesicle formation, endocytosis, exocytosis, cell respiration.

UNIT-IV

Cell cycle- Cell division by mitosis and meosis, Comparison of Meiosis an Mitosis, regulation of cell cycle, cell lysis, Cytokinesis, Cell signaling, Cell communication, Cell adhesion and Cell junction, apoeptosis, cell cycle checkpoints.

UNIT - V

Molecular organization and Nucleus, nucleolus, composition, properties, envelop, structure properties, stability, cleavage, functions and types of chromosomes, chromosomal arrangement, Chromosome staning, chromosomal observation aberration, chromatin, structure, homocrometin, hetro and polychromatin.

Books Suggested

1. Cell Biology Protocols by Harris, R., Graham, J. & Rickwood, D.
2. Color Atlas of Biochemistry by Koolman, J. & Roehm, K. H.
3. Molecular Biology of The Cell - Bruce Alberts.
4. Molecular cell Biology by Harvey Lodish. W. H. Freeman; Sol edition (2007).
5. Cell Biology Protocols by Harris, R., Graham, J. & Rickwood, D.
6. Current Protocols in Protein Science (All Vol) John Wiley & Sons.
7. The World of the cell by Becker, Kleinsmith and Harden Academic Internet Publishers; 5th edition (2006).
8. The Cell: A Molecular Approach, Fourth Edition by Geoffrey M. Cooper and Robert E. Hausman.
9. Cell and Molecular Biology by concepts and experiments by Gerald Karp (2005) John Wiley sons & Inc.

COURSE OUTCOMES

- Students will understand the structures and purposes of basic components of cell, especially membranes and organelles.
- Appreciate the cellular components underlying cell division along with a deep insight to cell division, cell death and uncontrolled cell division.
- Students will learn the basic principles of inheritance and patterns of heredity.
- Students will test and deepen their mastery of genetics by applying this knowledge in a variety of problem-solving situations.

M.Sc. BIOCHEMISTRY
Semester-I
Paper-III
BCH-103: Human Physiology and Endocrinology

COURSE OBJECTIVES

- The course is designed to assist the students to learn and understand fundamental concepts and principles of respiratory, renal, digestive, cardiovascular, muscle and neuro physiology.
- To develop a vocabulary of appropriate terminology to effectively communicate information related to anatomy and physiology.
- To study the interrelationships within and between anatomical and physiological systems of the human body.
- To understand the basic mechanisms of homeostasis by integrating the functions of cells, tissues, organs, and organ systems.
- To study the roll and mechanism of endocrine system in metabolism, regulation of normal homeostatic condition of body and other physiological functions.

UNIT-I

Blood- Composition of blood, structure & functions of formed elements, plasma and its consistuents & function of plasma proteins.

Blood coagulation- Mechanism & regulation, fibrinolysis, role of Hb in oxygen & corbon dioxide transports or 2,3 Dpce, Bohr effect and chloride shift.

UNIT-II

Digestive system- Composition, function& regulation of digestive juices, Digestion, absorption of carohydrate, proteions and fats of nucleic acids, minerals and vitamins.

UNIT-III

I. Excretory system-Structure of nephron, mechanism of urine formation, clearance values, composition of urine, Homeostasis & acid- base balance & imbalance.

II. Structure of neuron conduction of impulses across the nerve fibre salutary conduction. Synaptic transmission, role of neurotransmitter.

UNIT-IV

Muscles- Structure of skeletal muscles, Bio-chemical characterization of extra cellular matrix, plasma lemma, transverse tubular system, sarcoplasmic reticulum and myofibrils.

Actin, myosin, tropomysin, troponin, Z-disc and H-line components. The sliding filament mechanisms and other theories metabolic and chemical changes during muscle constriction.

UNIT-V

Hormones- endocrine system, basic knowledge of endocrinology, Classification of endocrine system, structure, function and disorders of pituitary, anterior and posterior pituitary gland, thyroid and parathyroid, adrenal, pancreases and reproductive hormones in case of human and female.

Books Suggested

1. Human Physiology by Devis.
2. Harper's Biochemistry (Lange Medical Books) (Paperback)By Robert K. Murray,Daryl K. Granner, Peter A. Mayes and Victor W. Rodwell. Publisher: Appelton and Lange.
3. Clinical Biochemistry By Richard Luxton. Scion Publishing Ltd.
4. Text book of Biochemistry and Human Biology -Talwar , G.P. and Srivastava. L.M., Printice Hall of india.
5. Human Physiology Chatterjee.C.C, Medical Allied Agency.
6. Textbook of Medical Biochemistry By MN Chatterjea and Rana Shinde, Jaypee Brothers. 1. Principles of Anatomy & Physiology by Tortora, G.J.
7. Textbook of Medical Physiology by Guyton and Hall.
8. Essentials of Medical Physiology by Sembulingam K.
9. Proteins: structure and function by Whitford, D.

COURSE OUTCOMES

- This course will provide a sound basis in human physiology to support in-depth understanding of physiological processes of all body systems in detail and on an appropriate level.
- Students will able to explain how the activities of organs are integrated for maximum efficiency.
- Students will be prepared to identify how changes in normal physiology lead to disease and it will support further study in health and medical sciences or related fields.

- This paper will also provide understanding of hormonal action in human body to regulate normal physiological activity of different organ system as well as metabolic process.

M.Sc. BIOCHEMISTRY
Semester-I
Generic Elective
Paper-IV
BCH-104: Biophysical Chemistry & Techniques

COURSE OBJECTIVE

- The objectives of this paper is to develop student's knowledge and capabilities in areas of analytical chemistry that are particularly relevant to the analysis of a range of sample types
- To understand the physical principles of a range of quantitative and quantitative analytical techniques.
- To study the range of spectroscopic technique to characterize the biomolecules.
- To understand the governing mechanisms and driving forces of various advanced separation processes.

UNIT-I

Water- Physical properties & Structure of water, hydrogen bonding, ionisation of water. pH scale concept of acids-bases & buffers, buffer ionisation behavior of amino acids and proteins. Henderson-Hasselbalch equation, biological buffering system. Principale of osmosis-Electroendomosis, Donan-membrane equilibrioum & its biological applications.

UNIT-II

Centrifugation- Basic principle of sedimentation, centrifuge and their uses. Preparative & analytical centrifugation and their application in biochemistry. Electrophoresis-General principle, factors affecting electrophoretic mobility, moving boundary & zonal electrophoresis, paper & gel electrophoreis, isoelectric focusing.

UNIT-III

Thermodynamics- Open, closed & isolated system, first & second laws of thermodynamics and their applications in living organisms. Molecular basis of entropy, Helmholtz & Gibbs free energy, equilibrium constant. Chemical potential, Phosphate group transfer potential coupled reactions.

UNIT-IV

Chromatography- General principle of partition, absorption, paper, column, thin layer, ion exchange & gas chromatography (GLC, GSC). Affinity & high performance liquid chromatography (HPLC) & Gel filtration chromatography.

UNIT – V

Spectroscopic techniques- Basic concepts of spectroscopy, General principle of NMR, ESR, UV, IR & Visible spectrophotometers Single beam and Double beam, Nanodrop spectrophotometer and X-ray diffraction technique.

Books Suggested

1. Analytical Biochemistry by Holme, D. J. & Peck, H.
2. Biochemical calculation by Segel.

3. Introduction to Protein Architecture: The structural biology of proteins by Lesk, A. M.
4. Modern Experimental Biochemistry by Boyer, R.
5. Biochemistry by Todd, W. B., Mason, M., Bruggen, R. V. & Macmillan
6. Wilson.K.AndWalker.J.Pub:CambridgePress2.PhysicalBiochemistry-Friefelder,Publisher D.W.H.FreemanPress.
7. Biophysical Chemistry:Principles and Techniques, 2nd edition by A.Upadhyay, K. Upadhyayand N.Nath. Himalaya Publishing House.

COURSE OUTCOMES

- To understand the concepts of preparation of buffers, molarity, normality, ionization, molality.
- The understanding of different types of chemical bonding, molecular machinery of living cells, principles that govern the structures of macromolecules and their participation in living system.

- To identify with the classification and structural properties of carbohydrates, proteins, nucleic acids and lipids,glycoproteins and glycolipids and their significance in biological systems.
- By the end of the course, the students will be able to demonstrate advanced knowledge and understanding of aspects of physical and chemical properties of aqueous solutions, concepts of free energy.

SEMESTER-I
PRACTICAL
(Duration: 6 hrs.)

Note- Practical examination of Bio-organic Chemistry/ Cell Biology/ Human Physiology and Endocrinology/ Biophysical Chemistry & Techniques will be conducted at the end of each semester during examination. Students will be given two exercises in the practical examination.

Lab I: Bio-organic Chemistry and Biophysical Chemistry & Techniques

Experiment - 1	15
Experiment -2	15
Viva Voce	10
Record	10
Total	**50**

Bio-organic Chemistry

Qualitative /Qualitative Analysis

1. Monosaccharides, Disaccharides and Polysaccharides.
2. Extraction of Starch from potato.
3. Extraction of Casein from milk.
4. Extraction of Lecithin from egg yolk.
5. Standard curve of maltose.
6. Standard curve of BSA.
7. Preparation of Buffers and determination of pH.
8. Titration of a weak acid.

Biophysical Chemistry & Techniques

Colorimetric and Spectrophotometric analysis:

1. Absorption spectrum determination based on Beer Lambert's Law.
2. Estimation of glucose by O T method.
3. Estimation of fructose by Seliwanoff's method.
4. Estimation of Ribose by Bial's method.
5. Estimation of Protein by Biuret method.
6. Estimation of Cholesterol by Zak's method.
7. Estimation of Phosphorus by Fiske Subbarow method.
8. Estimation of Iron -Wang's method.
9. Estimation of amino acid by Ninhydrin method.

Chromatography Analysis

1. Separation of sugar & amino acid by paper chromatography.
2. Separation of colour substances by paper chromatography.

Spectrophotometric analysis:

- Protein estimation by UV Spectroscopy.
- Cell fractionation (centrifuge).
- Demonstration of Electrophoresis.

Books Suggested

1. Biochemical Methods 1992, by S. Sadasivam and A. Manickam, Second Edition, New Age International Publishers, New Delhi.
2. Laboratory Manual in Biochemistry, 1981. J. Jayaraman, New Age International publishers, New Delhi.
3. An introduction to practical biochemistry. By: David T Plummer. Publisher Tata McGraw- Hill.
4. Biochemical Calculations - Segel, I.H. John Wiley & sons.
5. Experimental Biochemistry: A Student companion- Sashidhar Rao, B and Deshpande, V. IK International (P) Ltd.
6. Experiments And Techniques In Biochemistry: by Sheel Sharma, Galgotia publications

COURSE OUTCOMES

The students will be able to-

1. Estimate the qualitative and quantitative measurement of bioactive molecule from the different sources.
2. Separate and analyze different biomolecules present in different samples.
3. Student know the knowledge and handling with standard protocols and modern instrumentation.

Lab II: Human Physiology &Endocrinology and Cell Biology

Experiment - 1	15
Experiment -2	15
Viva Voce	10
Record	10
Total	**50**

Human Physiology and Endocrinology

1. To determine Hb% by Sahli's hemometer in blood samples.
2. To determine the hematocrit.
3. To determine the concentration of heparin in blood samples.
4. To determine the PTT in blood samples.
5. To demonstrate the effect of diet and hormones on the glycogen content of rat liver.
6. Microscopic observation of LS and TS of Reproductive organs and tissue.
7. Microscopic observation of LS and TS of Stomach related tissue.
8. Microscopic observation of Skin Muscles.
9. Microscopic observation of heart Muscles.

Cell Biology

1. Blood film preparation and identification of cells.
2. Cell organs fraction analysis by centrifuge.
3. Cell organelles observation under microscopy.
4. Isolation of cell organelles.
5. Cell membrane protein and lipid extraction.
6. Blood Film preparation and identification of cells.
7. Extraction and estimation of proteins from plant cell material.

8. Extraction and estimation of proteins from animal cell material.
9. Microscopic slide based observation of cellular division.
10. Bacterial cell staining and identification and characterization.

Books Suggested

1. Physiology by Guyton and Hall.
2. Medical Physiology by Best and Taylor.
3. Physiology by Garrett.
4. Harper's Reviews of Biochemistry.
5. Experiments and Techniques in Biochemistry: by Sheel Sharma, Galgotia publications.
6. Biochemical Methods 1992, by S.Sadasivam and A. Manickam, Second Edition, New Age International Publishers, New Delhi.
7. Laboratory Manual in Biochemistry, 1981. J.Jayaraman, New Age International publishers, New Delhi.
8. Experimental Biochemistry: A Student companion- Sashidhar Rao, B and Deshpande, V. IK International (P) Ltd.
9. Experiments and Techniques In Biochemistry: by Sheel Sharma, Galgotia publications.

COURSE OUTCOMES

The students will be able to

1. Estimate the qualitative physiological functional measurement according to their structure.
2. Separate and isolated by the fraction preparation of cellular components from any cellular /organ based samples.
3. Student know the knowledge and handling with standard protocols and modern instrumentation related to cell and organelles etc.

M.Sc. BIOCHEMISTRY
Semester- II
Paper-I
BCH-201: Enzymology

COURSE OBJECTIVES

- To study classification and basic structural properties of enzyme
- Detailed study on mechanical and kinetics properties of enzyme including various models of kinetics and various types of inhibition
- To acquire a detail knowledge of mechanism of enzyme action, regulation and allostery in enzyme
- To develop an understating on application and technological aspects of commercial valuable enzyme.

UNIT-I
Nomenclature and classification of enzymes, factors affecting the rate of enzyme catalyzed reactions, Michaelis-Menten concept of uni-substrate reaction, Briggs-Haldane relationship, Enzyme turnover and its significance, concept of Bi and multisubtrate reaction with classification and examples, kinetics of multisubstrate reaction, Ping-pond and ordered bi-bi mechanism.

UNIT-II
Co-enzyme and cofactors, metallo enzymes, protein-ligand binding, cooperativity, Hill equation and plot, immobilized enzymes and their industrial applications**.**

UNIT-III
Multi enzyme and allosteric enzymes; occurrence and properties of multienzyme system, mechanism of action and regulation of pyruvate dehydrogenase and fatty acid synthetase complexs, symmetrical and sequential models for action of allosteric enzymes and their significance.

UNIT – IV
Mechanism of catalysis: acid-base catalysis, electrostatic catalysis,covalent catalysis, serine protease ribonuclease, chymotrypsin, lysozyme, triose phosphate isomerase.

UNIT-V
Enzyme regulation general mechanisms of enzyme regulation, feedback inhibition and feed forward stimulation, control of enzyme activity by products and substrate. Enzymes repression, reversible and irreversible inhibition, covalent modification of enzymes.

Books Suggested

1. Enzymes By Palmar.
2. Fundamentals of Enzymology, Price. NC. and Stevens. L., Oxford University Press.
3. Enzymes-Biochemistry, Biotechnology, Clinical chemistry-Palmer,T.
4. Lehninger Principles of Biochemistry, DavidL. Nelson, Michael M. Cox Pub.: W.H Freeman.
5. Enzymes by Dixxon and Webb.
6. Fundamental of Enzymology by Price and Steveas.
7. Enzymes reaction Mechanisms by Walsch.
8. Enzymes structure and Mechanism by Alan Fershit.

COURSE OUTCOMES

- Students will be prepared for theoretically & practically to understand properties of enzyme.
- Enzymes are functional and its role in living system is unique.

- To understand ability to difference between a chemical catalyst and biocatalyst along with concept of enzymes-substrate kinetics and its importance in biological reactions.
- Enzymology paper is core Biochemistry subject, detailed understating of enzymology will help students to prepare their mind for interdisciplinary functional properties of protein.

- This paper gives platform to develop vast range of application of industrially valuable enzymes.

M.Sc. BIOCHEMISTRY
Semester – II
Paper – II
BCH-202: Microbial Biochemistry

COURSE OBJECTIVES

- To enable the student to learn the regulation of genes in bacteria.
- Morphology, classification and types of viruses.
- To introduce to the process of biological nitrogen fixation.
- Detailed information on antibiotics.

UNIT – I

Classification of microorganisms, general characteristics of main groups of microorganism's classification of bacteria, structure, recombination**.**

UNIT II

General organization of bacterial cells, gram-positive and gram-negative organisms, structure and function of bacteria physiology, membrane transport, locomotion and reproduction of bacteria, aerobic & anaerobic respiration.

Bacteriological media: types, and their use, culture characteristics of bacteria on different media. Cultivation, maintenance and preservation of culture, bacterial growth kinetics, growth curve, batch, continuous and synchronous culture, measurement of growth and factora affecting growth.

UNIT III

Role of microorganisms in food spoilage, food and food additives, food poisoning, food born infections and sewage (domestic and industrial) disposal, microbiology of food and dairy products, Industrial production of ethyl alcohol, lactic acid, ascorbic acid and penicillin, production of vaccine. Microorganism associated disease.

UNIT IV

Viruses structure, isoplation, identification, properties and classification, replication of RNA, viruses negative strand (VSV), positive strand (polio), retroviruses, replication of DNA (Adenovirus or SV 40), Plant viruses, Animal virus, Bacteriophages, Viroids, virus and cancer.

UNIT V

Sterilization and disinfection, culture media methods of securing pure culture, fermentation, stock cultures, fermentation media, continuous and multiple fermentation.

Control of microorganisms-Microbial death, concept of bioburden, thermal death and decimal reduction time. Control of microorganism by physical and chemical agent, Antimicrobial agent, antimicrobial sensitivity.

Books Suggested

1. Food microbiology -Adams, M.R. and Moss M.O.
2. Foundations in Microbiology -Kathleen Talaro and Arthur Talaro.
3. Industrial Microbiology -Patel, H.P.
4. Industrial Microbiology –Casida.
5. Industrial Microbiology -Prescott and Dunn.
6. Microbiology Concepts and Applications -Paul A. Ketchum.
7. Microbiology Concepts and Applications -McKane and Kandel.

COURSE OUTCOMES

- Students will be able to appreciate the entire spectrum of microscopic life forms - from relatively simple, small but unique viruses to bacteria.
- Enable the students to understand the fine mechanism of regulation of gene expression.
- Awareness will be created on different types of viruses and diseases caused by them.
- Appreciate the crucial role played by bacteria in nitrogen metabolism. 30
- Students will get deep insight to antimicrobials.

M.Sc. BIOCHEMISTRY
Semester- II
Generic Elective
Paper-I
BCH-203: Bio statistics and Computational Bioinformatics

COURSE OBJECTIVE

- Detailed understanding of genome projects, related disciplines of Bioinformatics use of Databases and Tools in Biological Discovery, Major Bioinformatics Resources.

- To gain detail on biological databases like primary sequence databases, protein three dimensional databases, Protein Structure Mathematical model databases, PCR and quantitative PCR primer databases, Chemical Databases, Drug & Drug Target /Therapeutic Target Databases, Disease databases, Immunological database.

- In depth study of various types of tools including sequence submission tools, Chemical molecule designing software, Protein & Chemical molecule visualization tools, Docking software, Molecular dynamics software; QSAR, ADME Toxicity prediction, Allergen prediction, Venomics & Antivenomics.

UNIT– I

Introduction to Biostatistics, applications, Methods of sampling, tabulation of data, its diagrammatic and graphical representation. Measurement of central tendency – mean, median and average. Measures of dispersion, variance and standard deviation, mean deviation, standard error, Range, Coefficient of variation.

UNIT– II
Probability, frequency distribution, measurement of central value frequency table, cumulative and relative frequency correlation, covariance correlation analysis and coefficient.

UNIT– III
Correlation and Regression, analysis, correlation and regression coefficients, linear regression and regression equation, test and types of significance, t-test, chisquare test and analysis of variance. Design of experiment, randomization, replication, local control, complementary randomized block design. Factor analysis, path analysis.

UNIT IV
introduction to computer fundamentals storage of data, operating system, concept of hardware and software and general operating commands (MS-DOS, MSWORD, Excel, PowerPoint), open office in Linex: Word Processor, spreadsheet Introduction to programming in basic and C.

UNIT-V
Introduction to internet and its application, introduction to bioinformatics: Introduction to MEDLINE on PubMed system for accessing biological information, Entrez, Swissport, PIR, NCBI. Stastical analysis software's, Plant Genome Database, Sequence Database: Content, structure and annotation for Human Genome Database, Multiple sequence allgnment programme- Clustal w, x. File management, file transfer (ftp, Wsftp), email.

Books Suggested

1. Fundamentals of Biostatistics by Bernard Rosner 5th Ed.
2. Bioinformatics Methods and Applications by Rastogi, S.C.
3. Bioinformatics for Dummies by Jean-Michel Claverie.
4. Textbook of bioinformatics by Subramaniam, C.
5. Introductory Biostatistics by Chap T. Le.
6. Fundamentals of Biostatistics by Bernard Rosner.
7. Review & Research papers from Bioinformatics & related Journals.
8. Arthur M. Lesk, Introduction to Bioinformatics, Oxford University Press, 2008.
9. David W. Mount, Bioinformatics- Sequence and Genome analysis, 2004.

COURSE OUTCOMES

- Students will choose appropriate experimental strategy for research in basic and applied biology.
- Explanation and integration of bioinformatics principles and its applications to basic and applied biology.
- Students will gain *in silico* training on data mining, database searching, software application, quantitative analysis and interpretation, molecular modeling, QSAR and various DNA, RNA and Protein analytical tools.
- Moreover, this paper enables students to acquire the knowledge of statistical analysis and its principles.

M.Sc. BIOCHEMISTRY
Semester – II
Paper – IV
BCH-204: Molecular Biology

COURSE OBJECTIVE

- Detailed understanding of prokaryotic and eukaryotic replication, types of DNA polymerases and inhibitors of DNA replication
- To gain detail on prokaryotic and eukaryotic transcription, translation and gene expression regulation
- To develop an understating of advanced technologies like RFLP, Sequencing, SSR, REMAP, SCAR and various types of PCR

UNIT I
Organisation, Identification and chemical nature of genetic materials, Gene concept morphology, chemical structure, concept of codon viral and prokaryotic DNA replication, Enzymology of DNA replication.

UNIT II
Transcription mechanism of both prokaryotes and eukaryotes, transcription factors,Translation, anti-genes RNA, regulation of gene expression in prokaryotes. Post transcription modification in eukaryotes, Post translation modification types and significance, Genetic code: evidence and properties.

UNIT-III
Bacterial recombination, conjugation, transformation,transduction, transposons, transposable element in prokaryotes and eukaryotes, types and significance retrovirus, DNA damage and repair, cot values C value, paradox DNA sequencing technique di-deoxynucleotide, partial rib substitution and gilbert etc PAGE detection and extraction of DNA from gels.

UNIT IV
Satellite DNA, recombination of DNA, DNA binding properties, split genes, Overlapping genes, Pseudogene, Cryptic genes, centromere DNA, Promiscuous DNA. Rearrangement of DNA.

UNIT V
Mutations types, classification and mechanism, mutagens types structures mode of functioning mutagenesis, site directed mutagenesis suppressor mutation, mutations determination, Mutation rate.

Books Suggested

1. Genes VIII, by Benjamin Lewin.
2. Molecular Biology, by Turner et al.
3. Cell and Molecular Biology: Concept and Experiments, by Geraid Karp.
4. An Introduction to grnrtic Analysis by Griffiths et al.
5. The Biochemistry of Cell Signaling, Helmreich JM, Oxford Press.
6. Cell signaling – John T Hancock, Oxford University press.
7. Cell and Molecular biology. Second edition: Edited by C A Smith and E J Wood. Chapman & Hall publication.

COURSE OUTCOMES

- Students will choose appropriate experimental strategy for research in basic and molecular biology.

- To perform laboratory techniques in basic biology, molecular biology, and advanced techniques. Explanation and integration of biological principles, as applied to basic and molecular biology.
- Development of strong diversified background in modern biology, appropriate to the individual student goals. Develop critical-thinking, and problem based learning skills.
- This paper will open an understanding of current trends in molecular and genetic research, and critically appraise published work.

SEMESTER-II
PRACTICAL
(Duration: 6 hrs.)

Note-Practical examination of Inorganic Enzymology/ Molecular Biology/ Microbial Biochemistry will be conducts at the end of each semester during examination. Students will be given two exercises in the practical examination.

Lab I: Enzymology and Molecular Biology

Experiment - 1	15
Experiment -2	15
Viva Voce	10
Record	10
Total	**50**

Enzymology

Enzyme assay

1. Determination of specific activity, effect of pH, temperature and substrate concentration of:
   (a) Salivary Amylase
   (b) Urease
2. Enzyme curve of amylase
3. Temperature curve of amylase
4. pH curve of amylase
5. Substrate curve
6. Specific activity of amylase
7. Activity staining of amylase
8. Activity of Immobilized Amylase
9. Fractionate BSA by salt precipitation
10. Specificity of enzyme action
11. Time course of enzymatic reaction

Molecular Biology

1. Estimation of DNA by diphenylamine method.
2. Estimation of RNA by Orcinol method.
3. Spectroscopic determination of melting temperature(Tm) of calf thymus DNA.
4. Demonstration of Amplification of desirable gene by Polymerase chain reaction.
5. Isolation, quantification and characterization (Spectrophotometric and agarose gel
6. Electrophoresis of total RNA, mRNA from plant and microbial sources.
7. Isolation, quantification and characterization (Spectrophotometric and agarose gel

8. Electrophoresis of genomic DNA from bacteria (E. *coli*).
9. Isolation, quantification and characterization (Spectrophotometric and agarose gel electrophoresis of genomic DNA from plant.
10. Molecular Profiling of Blood Plasma.
11. Molecular profiling of Animal tissues.

Books Suggested

1. Biochemical Methods 1992, by S.Sadasivam and A. Manickam, Second Edition, New Age International Publishers, New Delhi.
2. Laboratory Manual in Biochemistry, 1981. J.Jayaraman, New Age International publishers, New Delhi.
3. Enzyme assays- A Practical Approach, Eisenthal, R and Dawson, MJ, IRL press
4. Practical Biochemistry- Rameshwar. A, Kalyani Publisher.
5. Principles of Genetics by Eldon John Gardner, Michael J. Simmons, D. Peter Snustad; John Wiley.
6. Modern Genetic Analysis Anthony JF Griffiths, William M Gelbart, Jeffrey H Miller, and Richard C Lewontin. Pub. W. H. Freeman.
7. Statistics, Basic Concepts and Methodology for the Health Sciences Daniel WW, Pub Wiley India.
8. Lehninger Principles of Biochemistry, David L. Nelson, Michael M. Cox Publisher: W. H. Freeman.

COURSE OUTCOMES

1. Student will learn about the enzymatic reaction and standardization etc.
2. Student will learn about the pH and temperature and associated other factors necessary for the curve development.
3. Determination of specific activity will also acknowledge by the students.
4. Student will learn about the bioactive molecules separation by using the electrical charges.
5. Student will learn about the demonstration of Amplification of desirable gene by Polymerase chain reaction.
6. Isolation, quantification and characterization by using Spectrophotometric technique with involvement of agarose gel electrophoresis of genomic DNA from plant and animal tissue are also understand by the students.

Lab II: <u>Microbial Biochemistry and Bioinformatics</u>

Experiment - 1	15
Experiment -2	15
Viva Voce	10
Record	10
Total	**50**

<u>Microbial Biochemistry</u>

1. Preparation of culture media and sterilization methods.
2. Isolation of pure cultures: Streak plate method and Serial dilution method.
3. Gram Staining.
4. Differential staining: Acid fast staining, Giemsa staining, Leishmann staining.
5. Methods of isolation and identification of gram+ve and gram -ve bacteria.
6. Methods of isolation and identification of Fungi (Soil fungi).
7. Bacterial growth curve.
8. Widal test, VDRL test.

9. Antibiotic sensitivity by Disc diffusion and Broth dilution Methods.
10. Assay of pencillin and streptomycin as secondary metabolites.
11. Biotransformation of Antibiotics and Steroids.
12. Biodegradation of lignocellulosic waste.
13. Biodegradation of phenolic compounds.
14. Biodegradation of hydrocarbons.
15. Dye decolourization by microorganisms.
16. Isolation of bacteriophages from sewage / waste water
17. Reactivation of lysogenic viruses.
18. Plaque assay.
19. One-step growth assay.
20. Plaque reduction neutralization test

Bioinformatics

1. Retrieve Sequence From Nucleotide Databases (Genbank, Ena, Ddbj).
2. Retrieve Sequence From Protein Primary Sequence Database: Unipro.
3. Study of Literature Database-Pubmed.
4. Study of Compound Database-Pubchem.
5. Drug and Target Databases.
6. BLAST Search and Phylogenetic Tree.
7. Download Protein 3D Structure From Pdb.
8. Protein 3D Structure Visualization Tool-Rasmol.
9. Protein Structure database.

Books Suggested

1. Kannan N (1996) Laboratory Manual in General Microbiology. 1st Edition, Palani Paramount Publications, Palani, Tamilnadu.
2. Sundararaj T. Microbiology – Laboratory Manual. Revised and Published by Aswathy Sundararaj,No.5. 1st Cross Street, Thirumalai Nagar, Perundgudi, Chennai.
3. Aneja KR (2005). Experiments in Microbiology, Plant pathology and Biotechnology. 4th Edition, New Age International Publishers, Chennai.
4. James G Cappuccino & Natalie Sherman (2008) Microbiology: A Laboratory manual. 8th Edition, Published by Pearson Education.
5. Statistics, Basic Concepts and Methodology for Health Sciences Daniel W, Pub Wiley India
6. Biostatistics Arora & Malhan, Himalaya Publishing House. .

COURSE OUTCOMES

1. Student will learn about genomic database study.
2. Student will learn about the all Study of molecular and Compound Database along with their structures etc.
3. Bioinformatics and stastical tools along with computer application are essential it benefitted to student for new drug research and development fields etc.
4. Student will learn about the Microbial handling, isolation, purification and identification etc.
5. Student will learn about the all basic experimental handling concern to microbial testing and disease identification etc.
6. Microbial biochemistry knowledge in student establish microbial biochemical process and their management etc.

M.Sc. BIOCHEMISTRY
Semester-III
Paper-I
BCH-301: Metabolism and Plant Biochemistry

COURSE OBJECTIVES

- An advanced understanding of the core principles and topics of metabolic process and their biochemical reactions.
- To enable students to acquire a specialized knowledge and understanding of how enzymes and metabolites in living system works to produce energy and synthesizing different biomolecules.
- To study biochemical pathways involved in intermediary metabolism.
- To understand the principles and major mechanisms of metabolic control and of molecular signaling by hormones.
- The metabolism of dietary and endogenous carbohydrate, lipid and protein.

UNIT-I

Bioenergetics-Biological oxidations, oxygeneses, hydroxylases and dehydrogenanases, Gibb's energy, free energy changes, and redox potentials, phosphate potential, electron transport chain, substrate level phosphoryation and oxidative phosphorylation.

Carbohydrate Metabolism-Glycolysis, gluconeogenesis, Kreb's Cycle, hexose monophosphate shunt and glyoxylate pathway.
Glycogenolysis-glycogenesis, synthesis of mucopolysaccharides and bacterial cell wall polysaccharides.

UNIT-II

Lipid metabolism-Fatty acid oxidation-Beta oxidation and w oxidation. Biosynthesis and degradation of fatty acids triglycerides and phospholipids, cholesterol and bile acids, ketone bodies.

UNIT-III

Nucleic acid Metabolism-Nucleic acid metabolism, degradation of nucleoprotein, Catabolism of purin Pyrimidines, Biosynthesis of Purine, Pyrimidines, nucleolides and its regulation. - Gout and Liesch nyhan Syndrome.

UNIT-IV

Protein Metabolism-Proteolysis, deamination, transamination and decarboxylation reactions, urea cycle, Metabolism of individual amino acids. Plant Harmones-Growth regulationg substances and their mode of action, molecular effects of auxin, gibberellic, abscisic acids and cytokinins, gaseous plant hormone.

UNIT-V

Phtosystem I & II, their location, Mechanism of quantum capture and energy transfer between photo systems- ferridoxin, plastocyanin, photoquinone, carotenoids The Hill reaction, photophosphorylation and reduction of CO_2. C3, C4 and CAM metabolism, light and dark reaction and photorespiration.

Books Suggested

1. Biochemistry by Mathews
2. Biochemistry by Satyanarayana, U.
3. Biochemistry: The Chemical Reactions of Living Cells by Metzler, D. E.
4. Lehninger Principles of Biochemistry, David L. Nelson, Michael M. Cox Publisher: W.H. Freeman.

5. Molecular Biology of the Cell,3rd edition. Bruce Alberts, Dennis Bray, Julian Lewis, Martin Raff, Keith Roberts, and James D Watson. Publisher New York: Garland Science.
6. Biochemistry, 4th Edition-Donald Voet, Judith G.Voet–Publisher John Wiley & Sons.
7. The Cell: A Molecular Approach, by Geoffrey M. Cooper & Robert E. Hausman, Pub.
8. Molecular Cell Biology, Baltimore et. al. (1995) Scientific American Publication.

COURSE OUTCOMES

- Metabolism refers to all biochemical reactions which occur in the living organisms.
- By studying this paper students will able to differentiate the anabolic and catabolic pathways and their important enzymatic steps, understand how glycolysis produces metabolic energy as well as producing intermediates for further metabolic reactions.
- To acquire knowledge related to the principles and basic mechanisms of metabolic control and how regulation of biochemical pathways leads to normal integrated metabolism, understand the organization of a typical mitochondrion, locating membranes, enzymes, respiratory complexes, the F0-F1 complex, important transporter proteins and how it functions to synthesize ATP.
- To understand the importance of Integration of Metabolism, degradation, catabolism, hormonal regulation of metabolism etc will be exposed with the fact that perturbations in the bimoleculas lead to various diseases. To open new way into metabolic engineering for the production of useful compounds.

M.Sc. BIOCHEMISTRY
Semester-III
Paper-II
BCH-302: Immunology

COURSE OBJECTIVE

- In-depth knowledge and understanding of major cellular and molecular mechanisms underlying immunological processes in health and diseases
- To acquire a knowledge of immunochemical techniques in qualitative and quantitative analysis of antibodies and antigens.
- An understanding of the factors that determine the effectiveness of immune responses to microorganisms (bacteria, viruses, parasites) and tumours and how protective immunity can be elicited by vaccination.

UNIT-I

Introduction of immune system: Innate and acquired immunity, Active-passive immunity, Structure and functions of lymphoid organs, Cells involved in immune response (development of immune cells), Phagocytic cells & their killing mechanisms.

UNIT-II

effect or mechanism of immunity: Macrophage activation, Cell mediated cytotoxicity, Hypersensitivity and its types, MHC genes organization, types, functions.

UNIT-III

Antigen: Types of antigen, Immunoglobulins- structure, occurrence & functions, Antigen-antibody reaction, Antigen binding sites, Hybridoma technology, Monoclonal antibodies production, principle of selection, characterization, application in diagnosis , therapy and basis research.

Antibody engineering: Chimeric and Humanized monoclonal antibodies, Mice engineered with Human Ig loci, Phase display library for monoclonal antibody.

UNIT-IV

Transplantation immunology: immunologic basis of graft rejection & HLA tissue typing, Transplantation diseases, Complementation system – mode of activation, classical - alternative pathways, Biological functions of complement proteins, Cell mediated & humoral immune response. Cancer immunology: tumor antigen, immune reponse to tumor, oncogene and induction, cancer immunotherapy.

UNIT-V

Immunity to infection: Immune tolerance, Immunosupression, Immunodeficiency disorders, Autoimmunity, Vaccines- Active and Passive immunization whole organism vaccine, purified macromolecule as a vaccine, DNA vaccine, Recombinant vaccine and Subunit vaccine & diseases.

Immunological techniques: Immunoelectrophoresis, Radial & Double immunodifussion, RIA & ELISA, Western blotting and Immuneo-histochemical technique.

Books Suggested

1. Kuby Immunology, Thomas J. Kindt, Richard A Goldsby, Publisher WH Freeman & Co.
2. Immunology- Ashort Course.
3. Immunology by Tizzard.
4. Fundamental of Immunology by William Paul.
5. Immunolgy by Abbas.
6. Roitt's Essential Immunology, Tenth Edition, Ivan Roitt, Peter Delves
7. Veterinary Immunology: Ian R. Tizard, I.R. Thomson press
8. The Immune System. By Peter Parham Publisher Garland publishing
9. Biochemistry - J. David Rawn – Neil Patterson publication, NC.

COURSE OUTCOMES

- To attain a working knowledge of current immunological principles as they relate to the cells and molecules of the immune system.
- Understanding of mechanism of interaction in defending the body against invading microorganisms.
- Students will get knowledge of development and acquisition of ability to recognize antigens and finally how they malfunction in autoimmune diseases.
- Students will extend and solidify their understanding of the presented principles through critical readings from the primary research literature.

M.Sc. BIOCHEMISTRY
Semester-III
Paper-III
BCH-303: Clinical Biochemistry (Discipline Elective)

COURSE OBJECTIVE

- To study the classification and functional properties of blood components.
- To understand the coagulation, anti-coagulation mechanism of blood and its disorders.
- To study the biochemical, clinical, pathological and diagnostic aspects of diseases.

- To study dietary types, requirements, utilization and functions of different class of diet.
- To study the nutrition deficiency disorders and balance diet.

UNIT-I

Fluid & electrolyte balance and imbalance in various diseases.

Liver Function Tests: Van den Bergh test for bilirubin, urine and fecal urobilinogen, Determination of galactose, epinephrine test, Detoxification and excretion tests, Prothrombin Time, Determination of blood ammonia.

Kidney Function Tests: Urea clearance test, Creatinine clearance test, renal plasma flow, Concentration and dilution test, Function tests of pancreases,

UNIT-II

Disorders of Carbohydrates Metabolism: Diabetes mellitus Glycated hemoglobins, Blood sugars hypoglycemias, various types of glucose tolerance tests.

Disorders of Lipids: Hypoliproteinemia, Hyperlipoproteinemia, Atherosclerosis

Diagnostic tests for apolipoproteins, HDL - cholesterol, LDL - cholesterol and triglycerides. Fatty liver, Fats in diseases, Lipoproteins disorders, Ketone bodies.

Diagnostic Tests for Proteins: Total protein, albumin, globulin and fibrinogen

Disorders of Thyroid: Hyperthyroidism, Hypothyroidism. Thyroid function Tests: T3, T4, TSH, TRH

UNIT-III

Enzymes in different diagonosis of disease & their clinical significance: Serum Aspartate aminotransferase, alanine aminotransferase, creatine kinase, gamma glutamyl transpeptidase, alkaline phosphatase.

Biochemical Aspects of Hematology:

Complete blood count (CBC)- RBC, WBC, platelet counts, Hb, Bleeding time, clotting time

Cerebrospinal fluid (CSF) chemistry and clinical significance.

- Biochemistry of detoxification, Xenobiotic metabolism.
- Metal ion toxicity, chelation therapy, antioxidant therapy.
- Biochemistry of Ageing, Cancer, AIDS, Cholera-Vibriotoxins, pathogenesis. Jaundice, Arthrities, Nutrition and Chronic clinical disease.

UNIT-IV

Mechanism of drug action- Penicillin, Tetracycline, Streptomycin, Chloramphenicol & Sulphonamides.

Apoptosis: Carcinogens, Cancerous growth & Chemotherapy, radioactivity: radioisotopes in medicine.

UNIT-V

Disorders of mineral metabolism and trace elements: Hypo-Hypercalcemia, Hypo-Hyperphosphatemia, Disorders of amino acids, steroids and vitamins.

Disorders of erythrocyte metabolism: hemoglobinopathis, thalassemias & anemia's.

Biochemical Hazards of dangerous environment pollutants.

Books Suggested

1. Text book of Biochemistry and Human Biology –Talwar , G.P. and Srivastava. L.M., Printice Hall of india.
2. Human Physiology - Chatterjee. C.C, Medical Allied Agency.
3. Textbook of Medical Biochemistry By MN Chatterjea and Rana Shinde, Jaypee Brothers.

4. Lehninger Principles of Biochemistry 5th edition ByDavid L. Nelson and MichaelM. Cox,WH, Freeman and Company.
5. Clinical Biochemistry: An Illustrated Colour Text (Paperback) 3rd Edn By Allan Gaw, Michael Murphy, Robert Cowan, Denis O'Reilly, Michael Stewart and James, Shepherd. Publisher: Churchill Livingstone.
6. Harper's Biochemistry (Lange Medical Books) (Paperback)By Robert K. Murray.
7. Granner, Peter A. Mayes and Victor W. Rodwell. Publisher: Appelton and Lange.
8. Clinical Biochemistry By Richard Luxton. Scion Publishing Ltd.

COURSE OUTCOMES

- Advanced understanding and knowledge of theoretical and practical aspects of blood biochemistry and its components.
- Connection of blood to entire organ system of body in single circulatory channel and consequences of environmental and genetic factors of blood disorders.
- Rationale and theoretical basis for methods and tools used in the diagnosis of common biochemical disorders.
- Distinguish between between fat-soluble vitamins and water-soluble vitamins, biochemical functions and synthesis for these vitamins.

M.Sc. BIOCHEMISTRY
Semester-III
Generic Elective
Paper-IV
BCH-304: Genetic Engineering

COURSE OBJECTIVE

- To equip students with a basic knowledge of the structural and functional properties of cells.
- To examine properties of differentiated cell systems and tissues.
- Aspect of cell cycle and cell death.
- To introduce the fascinating mechanism of cell signaling along with brief overview on developmental biology.
- To provide thorough knowledge on classical genetics.

UNIT-I

Laws of Mendels-Applications and deviations, Monohybrid and dihybrid crosses, Sex etermination and Sex linked inheritance, Sex differentiation, Blood group inheritance and determination, Maternal affects and cytoplasmic inheritance, Fine structure of gene.

UNIT-II

Recombinant DNA Technology

Restriction enzymes- nomenculture, classification and mode of action. Cloning vectors- Plasmid, Bacteriophages, cosmid, phagemid and animal virus. Purification of DNA from living cells, Manipulation of purified DNA, Cloning in Pro & eukaryotic cells, DNA hybridization and blotting techniques. cDNA library. DNA probe, Nick translation, Genetic mapping.

UNIT-III

Tissue Culture

Micropropagation, somatic cell culture, Somatic cell hybridization. Protoplast isolation - fusion, Nif gene transfer. Transformation techniques, integration and analysis or conformation of transgene

integration. Transgenic plant and transgenic animals, Application of recombinant DNA technology or Genetics engineering in agriculture, medicine DNA vaccine and molecular diagnostic.

UNIT-IV

Population genetics- Gene pool and gene frequency, models of gene pool structure-Classical hypothesis, Balanced hypothesis, Hardy- Weinberg law and its application in calculating gene frequencies, deviations from Hardy-Weinberg equilibrium.

Genetics involved-Sickle cell anaemia, Thalessemia and Cancer.

UNIT-V

Gene Techniques - DNA finger printing, DNA foot printing, RFLP, RAPDs, Molecular markers, PCR, Immuno-PCR, Antisense RNA technology, Biosensor development and applications, Microarray chips, types and their application, Human Genome project (HGP). Biosafty and ethical consideration for GMOs.

Book Suggested

1. Gene and Genome by Premrose.
2. Genetics by P. K. Gupta.
3. Cell Biology Protocols by Harris, R., Graham, J. & Rickwood, D.
4. Color Atlas of Biochemistry by Koolman, J. & Roehm, K. H.
5. Molecular Biology of The Cell - Bruce Alberts
6. Molecular Cell Biology by Lodish, H.
7. PrinciplesofGeneticsbyEldonJohnGardner,MichaelJ.Simmons,D.PeterSnustad;JohnWiley3.
8. Molecular Genetices of the gene by Watson.
9. Genes IX by Lewin, B.
10. Essential Molecular Biology by T. A. Brown
11. Biotechnology by B. D. Singh.
12. Route map in gene technology by Walker and Rapley.

COURSE OUTCOMES

- To provide thorough knowledge on classical and population genetics along with evolutions.
- Understanding of application of recombinant DNA technology or Genetics engineering in agriculture, medicine DNA vaccine and molecular diagnostic.
- Understanding of Biosafty and ethical consideration for genetic modified organism and crops developments.
- Understanding of modern gene techniques, operation and advantages in recovery and hilling of genetics involved disease.
- Understanding of Blood group, sex and other associated genetic inheritance process.

SEMESTER-III
PRACTICAL
(Duration: 6 hrs.)

Note- Practical examination of Inorganic Enzymology/ Molecular Biology/ Microbial Biochemistry will be conducted at the end of each semester during examination. Students will be given two exercises in the practical examination.

Lab I: Genetic Engineering and Clinical Biochemistry

Experiment - 1	15
Experiment -2	15
Viva Voce	10
Record	10
Total	**50**

Genetic Engineering

1. Restriction Digestive Enzymes identification.
2. Isolation of Plasmid DNA and Separation in Electrophoresis.
3. Isolation of genomic DNA.
4. Chromosome microscopic observation during the cell division of different phases.
5. Demonstration of Gel Electrophoresis
6. Isolation of DNA from Blood
7. Bacterial Transformation
8. Western Blotting
9. Isolation of Plasmid DNA By Alkaline Lysis Method
10. Bacterial Genomic DNA Isolation
11. DNA Extraction from Plant Tissue (Strawberry)
12. Nucleic Acid Purity Assessment Using A260/A280 Ratio.

Clinical Biochemistry

I. Hematology

1. Estimation of Hemoglobin – colorimetric method
2. Enumeration of RBC & WBC
3. Differential Smear – Blood cells count
4. Bleeding time & Clotting time
5. Identification of blood grouping & typing
6. Evaluate ESR & PCV
7. Ascorbic Acid Estimation
8. Iron Estimation

ii. Assay of serum marker enzymes

1. Determination of activity of SGOT and SGPT
2. Determination of activity Acid Phosphatase and Alkaline Phosphatse.
3. LFT(Liver function Test), KFT (Kidney function test).

iii. Blood analysis

1. Estimation of blood glucose by Asatoor and King method.

2. Estimation of serum creatine and creatinine by - Alkali-Picrate method.
3. Estimation of Determination of Total proteins in whole blood Biuret method.
4. Determination of urea in serum.
5. Estimation of Cholesterol in serum.
6. Estimation of Tryglyceride in serum.
7. Determination of Bilirubin (Conjugated & Unconjugated) in serum.

IV. Urine analysis

1. Estimation of Urea in urine
2. Determination of Creatine and Creatinine in urine-Alkali-Picrate method
3. Estimation of Uric acid
4. Determination Chloride
5. Physical properties of urine: Microscopic and visual observation for normal and abnormal constituents, color, density, crystals and pH etc.

Books Suggested

1. Biochemical Methods (1992), by S. Sadasivam and A. Manickam, Second Edition, New Age International Publishers, New Delhi.
2. Introductory practical Biochemistry (2005), by S. K. Sawhney and Radhir singh, Alpha Science International publishers, 2nd Edition.
3. Practical Clinical Biochemistry –Varley, H. CBS Publications
4. Practical Clinical Biochemistry-Methods and Interpretations – Ranjna Chawla- Jaypee
5. Lab Manual in Biochemistry, Immunology and Biotechnology – Arti Nigam and Archana Ayyagari, Tata McGraw-Hill New Delhi.
6. Biochemical Methods (1992), by S. Sadasivam and A. Manickam, Second Edition, New Age International Publishers, New Delhi.
7. Introductory practical Biochemistry (2005), by S. K. Sawhney and Radhir singh, Alpha Science International publishers, 2nd Edition.

COURSE OUTCOMES

1. The students will be able to Performed all hematological tests related to human body system.
2. The students will be able to perform functional test of the body like LFT, KFT related to diagnosis purpose.
3. Student understands the process of disease diagnosis, related to other collected body fluids.
4. Students understand the concept of Histopathology, biochemical test, pathological investigation, recovery response etc.
5. The students will be able to isolate the DNA from different resource.
6. The students will be able to perform the Nucleic Acid Purity Assessment Using A260/A280 Ratio.
7. Student understands the process of Restriction Digestion by using the enzymes.
8. Students understand the concept of bacterial transformation, isolation of Plasmid DNA and manipulation etc.

Lab II: Plant Biochemistry and Immunology

Experiment - 1	15
Experiment -2	15
Viva Voce	10
Record	10
Total	**50**

Plant Biochemistry

1. Estimation of plant lipids and carbohydrates
2. Estimation of plant proteins
3. Microscopic observation of plant cell.
4. Isolation of Chlorophyll
5. Mitosis
6. Osmosis in Onion Cells
7. Effect of Temperature on Plant Cell Membrane
8. Isolation of Chloroplast
9. Extraction, separation and determination of absorption spectra of plant pigments.
10. Fractionation of cell organelles from plant tissues.
11. Estimation of nitrogenase.
12. Estimation of nitrate reductase- *in vivo* method.
13. Fruit ripening. Estimation of total phenolic compounds.
14. Estimation of anthrocyanin pigments.

Immunology

1. Single (Radial) Immuno diffusion.
2. Double (Outcherlony) immune diffusion.
3. Immuno electrophoresis.
4. Blood Grouping
5. Widal Test
6. Immuno diagnosis related to Ag-Ab interaction concept.
7. Testing kit related diagnosis based on Ag-Ab reaction etc.
8. Sandwich ELISA
9. Lymphoid organs and their microscopic organization.

Books Suggested

1. Biochemical Methods (1992), by S. Sadasivam and A. Manickam, Second Edition, New Age International Publishers, New Delhi.
2. Introductory practical Biochemistry (2005), by S. K. Sawhney and Radhir singh, Alpha Science International publishers, 2nd Edition.
3. Biochemical Methods (1992), by S. Sadasivam and A. Manickam, Second Edition, New Age International Publishers, New Delhi.
4. Introductory practical Biochemistry (2005) by S. K. Sawhney and Radhir singh, Alpha Science International publishers, 2nd Edition.

COURSE OUTCOMES

1. The students will be able to perform, immune diagnosis related to Ag-Ab interaction concept.
2. The students will be able to perform, blood and other fluid related Ag-Ab interaction concept.
3. The students understand the role of immunology in case of various diseases related to allergy, bacteria, virus, AIDS, Arthritis, skin allergens etc.
4. The students will be able to Performed all bioactive molecule and compound separation related to plant cells.
5. The students will be able to perform estimation of essential beneficial pigments.
6. Student understands the process of disease diagnosis related to plants parts and products.
7. Students understand the concept of estimation of plant proteins, Chloroplast etc.

M.Sc. BIOCHEMISTRY
Semester-IV
Paper-I
BCH-401: Pharmaceutical Biochemistry

COURSE OBJECTIVES

- To study the drug development process, absorption and metabolism
- To develop a concept of drug action, receptor interaction, roll of enzyme in stimulation or inhibition of drug activity
- To understand the lethal and effective dose of drug; Mechanism of drug delivery systems.
- To study the different guidelines for manufacturing of drugs.
- In-depth study of intellectual property rights.

UNIT-I
Pharmacokinetics
Source and nature of drugs, classification, nomenclature. principles of drug action, absorption, distribution and elimination of drugs, routes of drug administration. Drug–protein interactions. dose response curve - ED50 and LD50, Origin of drug from plants and animals, Uses of Pharmacokinetics In Drug Development Process, Concept of Prodrug and Soft Drug. Synergism and Antagonism, Acute and chronic exposures, factors influencing toxicity.

UNIT-II
Pharmacodynamics and drug target
Introduction, Concept of Receptor Agonists and Antagonists, Drug Receptors receptors, Enzymes, carrier proteins Interactions, Theories of Drug Activity Relationship, Forces involved in drug - receptor interaction, Receptor theories. Cholinergic and anticholinergic drugs, adrenergic and adrenergic blockers, General anesthetics, Local anesthetics. Adverse reactions to drugs and common drug receptor interactions,.Treatment of Diseases by Enzyme Stimulation, Elementary treatment of drug Receptor Interaction, Ld50, Ed50, Mic and Mec, Membrane Active Drugs,. Mechanisms of drug effects, Drug delivery Systems, Liposomes.

UNIT-III
Regulatory Affairs and Pharmacovigilance
Pharmaceutical Products-their Manufacturing, Analytical Aspect, Product Registration and their Requirement looking to WHO-GMP, European DMF, US-FDA Regulations, ICH Guidelines, pharmacopael and extra pharmacopaeal Entry.

Definition and aims of pharmacovigilance, Adverse drug reactions, Classification, mechanism, predisposing factors and causality assessment. Role of clinical pharmacist in reporting, evaluation, monitoring, prevention and management of ADR, drug induced diseases. Pharmaco epidemiology, Epidemiological approach, measurements epidemiology, (rates, ratios, and proportions), measurement of mortality, morbidity. Descriptive, analytical and experimental epidemiology.

UNIT-IV
Intellectual Property Rights
Documentation Required for Filing Patent, Chemical, Physical and Biological (Clinical) Data Documentation, Patent Writing Art and Introduction of Concept of Non-infringing Patent Ability, Looking to GATT-WTO Scenario, Computer Based Data Mining in Drug Research, Pharmaceutical Product Management Aspect.

UNIT-V

Pharmaceutical associated toxicity

Xenobiotics metabolism, Phase-I reactions, Oxidation, reduction, hydrolysis & hydration. Phase-II reactions\conjugation, Methylation, glutathione & amino acid conjuctions, detoxifications. Metabolism of CCl_4 & Paracetamol & their effect in liver & kidney.

Book Suggested

1. Environmental Biology and Toxicology, P. D. Sharma, Rastogi.
2. Textbook of Toxicology, BalramPani, IK.
3. Casarett&Doull's Essentials of Toxicology, Klaassen, MGH.
4. Toxicology: Principles and Applications, Niesink, CRC.
5. Clinical Toxicology, FACMT, Saunders.
6. Environmental Pollution and Toxicology, Johi, APH.

COURSE OUTCOMES

- Gain detail understanding of how drug act inside the body after absorption from intestine in to blood.
- Understanding of factors that affect drug absorption, interaction with target receptors and inhibition of enzymes.
- Understanding of process of product registration and different guidelines which control the manufacturer to follow correct strategy for manufacturing of drug.
- Learn how to write and file the patent; how to document clinical data of the concern drug research.

M.Sc. BIOCHEMISTRY
Semester-IV
Paper-II
BCH-402: Biochemical Toxicology and Clinical Research

COURSE OBJECTIVES

- To study the ICMR and Ethical Guidelines as per standardized toxicological values.
- To understand the in vitro-in vivo performed experimentation.
- To study the Biological testing and bioassays during Clinical trials observation.
- To study about the Single dose and repeat dose toxicity studies.
- To study the Nutrition toxicology and Immunotoxicology.

UNIT-I

Nutrition toxicology and Immunotoxicology: Determination of metal content in samples, Neurotoxicology, Occupational toxicology. toxicology of environmental, Risk assessment and chemical safety evaluation, Legislation and International regulation, Toxic metals in environment, toxicity of Petroleum, Pesticide types and toxicity, Environmental consequences of pesticide toxicity.

Pesticide, ionizing radiations and gaseous pollutants. Toxicokinetics, Biotransformation and degradation of toxicants.

UNIT-II

Pre clinical toxicology: Basic Concepts, toxicants of public health hazards and toxic compounds, Epidemiology and biostatistics in Toxicology, Absorption, translocation and excretion of toxicants. Systemic toxicology (Single dose and repeat dose toxicity studies), Carcinogenicity, Mutagenicity,

Teratogenicity, Reproductive toxicity, Local toxicity, Genotoxicity, animal toxicity requirements. Exposure assessment and analytical methods in toxicology, toxicological pathology.

UNIT-III

Clinical research: Types of clinical trials, single blinding, double blinding, open access, randomized trials and their examples, interventional study, ethics committee and its members, cross over design, Institution Ethics Committee/Independent Ethics Committee. Clinical research data management. Organ, genetic and reproductive toxicology, Toxic genomics.

UNIT-IV

Biological testing and bioassays during Clinical trials: Testing drugs in vitro and in vivo, New drug discovery process- purpose, main steps involve in new drug discovery, timelines in steps, advantage and purposes of steps, clinical research ethics, unethical trials, thalidomide tragedy, Clinical trials phases, Safety monitoring in clinical trials. Regulatory requirements in clinical trials, Schedule Y, ICMR guidelines, documentation in clinical study. Indian GCP guidelines (CDCSO guidelines) ICMR Guidelines, Ethical Guidelines for Biomedical Research on Human Subjects Schedule.

UNIT-V

Bioavailability and Bioequivalence studies: Factors affecting bioavailability, types: absolute v/s relative, single v/s multiple dose studies, healthy volunteers vs patient studies, measurement of bioavailability, drug dissolution rate and Bioavailability, in vitro-in vivo correlation, methods for enhancement of bioavailability. Bases for Determining Bioequivalence, Design and Evaluation of Bioequivalence Studies Analytical Methods, Reference Standard, Extended Release Formulations, Combination Drug Products, Study Designs.

Book Suggested

1. Pharmacology and Pharmacotherapeutics, 23 rd Edition, Popular Prakasham, Bombay.
2. Modern Pharmacology with clinical correlations, 6th Edn., Charles R. Creig, and Robert E. Stitzel, Lippincott Williams & Wilkins.
3. Foye's Principles of Medicinal Chemistry, Williams, D.A. 6th Edn. Lippincott Williams & Wilkins (2008).
4. Fundamentals of Experimental Pharmacology, Ghosh, M.N. 2nd Edn, Scientific Book Agency, Kolkatta (1984).
5. Wilson and Walker's Principles and Techniques in Biochemistry and Molecular biology; 8th Edn., Andreas Hofmann and Samuel Clokie; Eds. Cambridge University Press, New Delhi.
6. Applied Biopharmaceutics and Pharmacokinetics, Shar gel, L. 2012. McGraw- Hill Medical.
7. Text Book of Receptor Pharmacology, Foreman, J.C. & Johansen, T. J. 2nd Edn., CRC Press (1996).
8. Drug discovery and Development 2nd Ed. Reymond G Hill, Humphry P Rang, Churchill Livingsten, Lange (2012).
9. Applied Biopharmaceutics & Pharmacokinetics, 5th Edn. Leon Shargel, Susanna WuPong, Andrew B.C. Yu.
10. Basic and Clinical Pharmacology, Prentice hall, International, Katzung, B.G.
11. Clinical Pharmacology, Scientific book agency, Laurence, DR and Bennet PN.
12. Remington Pharmaceutical Sciences, Lippincott, Williams and Wilkins.
13. Text Book of Therapeutics Drug and Disease Management Hardbound. Richard A Helms.
14. IPR, Biosafety and Bioethics, Deepa Goel and Shomini Pearson (2013).

COURSE OUTCOMES

- Gain detail understanding of how drug and toxicant act inside the body an after absorption from intestine in to blood it affect the body.
- Understanding of factors that affect drug absorption, Bioavailability and Bioequivalence concept.

- Understanding of process of product registration and different guidelines which control the manufacturer to follow correct strategy for manufacturing of drug and Pre clinical toxicology studies.
- Learn how to write and file the patent; how to document clinical data of the concern to clinical research.
- Understanding of process Biological testing and bioassays during Clinical trials of drug and toxicant**.**

M.Sc. BIOCHEMISTRY
Semester-IV
Discipline Elective
Paper-III
BCH-403: Food and Nutritional Biochemistry

COURSE OBJECTIVES

- To study the classification and functional properties of blood components.
- To understand the coagulation, anti-coagulation mechanism of blood and its disorders.
- To study the biochemical, clinical, pathological and diagnostic aspects of diseases.
- To study dietary types, requirements, utilization and functions of different class of diet.
- To study the nutrition deficiency disorders and balance diet.

UNIT -I

Direct and indirect calorimetry, energy value of the foods, thermal equivalent of oxygen, respiratory quotient, calorigenic action of the foods, basal metabolic rate- definition and its measurement, factors affecting BMR, energy requirements of the human beings.

UNIT-II

Nutritional aspects of the carbohydrate-Different dietary types, available and unavailable carbohydrates, requirements, utilization and functions. Special role of non-starch polysaccharides.
Nutritional aspects of the lipids- Different dietary types, requirements, utilization and functions. Essential fatty acids.

UNIT-III

Nutritional aspects of the proteins- Quality of proteins, digestibility coefficient, net protein utilization, biological value and amino acid score, protein requirements and functions. Nutritional diet support of infant. Pre-operation and post operational condition. Importance of food for existence of life. Modes of nutrition in life forms Comparable and contrasting features

UNIT -IV

Nutritional aspects of the vitamins and minerals. WHO and ICMR recommendation of Vitamins and Minerals. Disease and Minerals diagnosis.

Human Health and Disease: Nutrition (Health), definition, classification, food and non food sources.Nutraceuticals; use of nutraceuticals in traditional health sciences. Role of omega-3 fatty acids,carotenoids, dietary fiber, phytoestrogens; glucosinolates; organosulphur compounds in health and disease (prevention and control).

UNIT -V

Balanced diet- Recommended dietary allowances for different categories of human beings. Food processing and loss of nutrients during processing and cooking. Naturally occurring anti-nutrients. Disorders related to the nutrition - Protein energy malnutrition, Starvation, Obesity.

Functional foods: Definition, development of functional foods, benefits and sources of functional foods in Indian diet. Effects of processing conditions and storage.

Book Suggested

1. Vitamins, Their Role in the Human Body by Ball.
2. The Vitamins by Gerald F. Combs .
3. Human Nutrition by Geissler Powers.
4. Human Nutrition and Dietetics by Ashok Kumar Sharma.
5. Nutritional Biochemistry by Tom Brody.
6. Human Nutrition and Dietetics by Davidson & Passmore.

COURSE OUTCOMES

- Gain detail understanding of Nutraceuticals; use of nutraceuticals in traditional health sciences from intestine in to blood it affect the body.
- Understanding of factors that affect food digestion and absorption, Bioavailability and Bioequivalence concept.
- Understanding of importance of food for existence of life.
- Learn how to processing and loss of nutrients take place during processing and cooking.
- Recommended dietary allowances for different categories of human beings.

M.Sc. BIOCHEMISTRY
Semester-IV
Generic Elective
Paper-IV
BCH-404: Industrial Biochemistry

COURSE OBJECTIVES

- To study the classification and functional properties of fermentation technique and products.
- To understand the standard process and SOP for industrial setup and product development.
- To study the biochemical aspects of industrial protocols and standardization regarding product development.
- To study dietary types, requirements, utilization of fermented industrial antibiotics etc.
- To study the Commercial enzyme in beverages development and production.

UNIT-I

Techniques of fermentation systems, Role of Fermentation, Biochemistry of Fermentation: Fermentation of Carbohydrates, Protein. Lipid Metabolism, Formation of flavour. Advanced continuous fermentation for anaerobic microorganisms, Fermentation process development of carbohydrate based therapeutics. Commercial production of plant proteins in microorganisms. Benefits of fermented products.

Bioprocess development for detoxification and decolonization, Fermentation process validation. Genetic manipulation of industrially important microorganisms.

UNIT-II

Food processing and fortification: Principles, objectives and rationale, selection and basis of fortificants. Technology of fortifying cereal products. Characteristics of nutrients used in cereal fortification. Fortification methods. Fortification premixes, Design and composition of premixes and quality control. Fortification of bread, pasta, noodles, biscuits, and breakfast cereals.

UNIT-III

Development of nutraceutical and functional foods, Standards for health claims.

Development of Prebiotics and probiotics: Mechanics and usefulness of probiotics and prebiotics in gastro intestinal health and other benefits. Beneficiary microbes; prebiotic ingredients in foods; types of prebiotics and their effects on gut microbes, probiotic allergy,

Industrial production of Antibiotics: Penicillin, Streptomycin, Tetracyclines Organic acids, Citric acid, Lactic acid, Acetic acid, Enzymes: Amylases, Proteases, lipases Amino acids - Lysine, Glutamic acid.

UNIT-IV

Food additives: Definitions, functions and uses in processed food products. Chemical, technological and toxicological aspects of acid, base buffer systems, salts and chelating/sequestering agents, leavening agents, antioxidants, emulsifying and stabilizing agents,

anti-caking agents, thickeners, firming agents, flour bleaching agents and bread improvers.

Sweetening agents: Artificial sweeteners, composition, uses. Natural and synthetic colors**,** food Flavors, Spices and flavoring constituents, flavors in food industries.

UNIT-V

Beverages Technology: Beverages; importance of beverage fortification, Health benefits of fortification, Selection of nutrients for fortification, Levels to be added, Characteristics of fortificants and method of fortification, Bioavailability, Organic Vs inorganic salts. Health foods; selection of nutrients,Technology of incorporation of fortificants, bioavailability.

Commercial enzyme in beverages: fruit juices, beer, wine, and distilleries; dairy, baking, oils and fats, plantation products, animal products. Malting and germination of grains process, characteristics, nutritional benefits and uses. Domestic use products like detergents. Textiles, Denim processing, Leather industry.

Book Suggested

1. Biochemistry Ed. Donald Voet & Judith G. Voet, John Wiley & Sons, Inc.(2010).
2. Lehninger- Principles of Biochemistry; D.L.Nelson and M.M. Cox, 6th Edn. MacMillan Publications (2012).
3. Nutrition: Science and Applications, 3rd Edn. Lori A. Smolin, Mary B. Grosvenor, Wiley (2013).
4. Introduction to Human Nutrition, 2nd Edn. Michael J. Gibney, Susan A. Lanham-New, Aedin Cassidy, Hester H. Vorster, Wiley-Blackwell (2009).
5. Nutrition: Everyday Choices, 1st Edition; Mary B. Grosvenor, Lori A. Smolin Wiley (2006).
6. Bioactive Food as Dietary Interventions for Liver and Gastrointestinal Disease; Watson Elseveir (2012).
7. Food, Nutrition and Health. Tapsell L. Oxford University Press (2010).

COURSE OUTCOMES

- Gain detail understanding of Techniques of fermentation systems, Role of Fermentation, Biochemistry of Fermentation for industrial product development.
- Understanding of commercial enzyme in beverages and their associated biochemical process.

- Understanding of importance of food, Food additives, artificial food additives and their biochemistry.
- Learn how to processing are involve in prebiotics and probiotics production in industry.
- Learning in the development and production of different bioactive product for human welfare.

SEMESTER –IV
PRACTICAL
(Duration: 6hrs.)

Note- Practical examination of Inorganic Pharmaceutical Biochemistry/Biochemical Toxicology and Clinical Research, Nutrition Biochemistry /Industrial Biochemistry will be conducted at the end of each semester during examination. Students will be given two exercises in the practical examination.

Lab I: Pharmaceutical Biochemistry and Industrial Biochemistry

Experiment - 1	15
Experiment -2	15
Viva Voce	10
Record	10
Total	**50**

Pharmaceutical Biochemistry and Industrial Biochemistry

1. Qualitative analysis of lipids.
2. Pharmacokinetics studies by the linearity estimation.
3. Saponification value of fats.
4. Iodine number of oil.
5. Peroxide value of fats.
6. Artificial sweeteners stability analysis.
7. Drug stability, solubility analysis.
8. Preservative stability analysis.
9. Antibiotics sensitivity test for Amphicillin.
10. Pharmaceutical associated toxicity determination: Xenobiotics.
11. Qualitative and quantitative determination of nutritive value of food ingredients.
12. Qualitative and quantitative determination of plant proteins.
13. Qualitative and quantitative determination of fermented product.
14. Quality validation of process.
15. Neurotoxicology, Occupational toxicology testing.
16. Commercial enzyme estimation concern to beverages industries.
17. Standard Operating Procedure updating and review.

Book Suggested

1. Tietz Text book of Clinical Chemistry.
2. Clinical Chemistry by DF Calbreath.
3. Clinical Biochemistry by Varley.
4. Practical Biochemistry By S. P. Singh.
5. Practical Biochemistry by A.C. Dev.
6. Pharmacology by Rang and Dele.

COURSE OUTCOMES

- Estimate the pharmacokinetics of the pharmaceutical compounds in pure and combined form.
- Estimate and validate the Quality of process and developed product.
- Quality validation process for raw material and product.
- Quality validation for Standard operating procedure (SOPs) use for the product formulation and development.
- Students understanding the process of product registration and different guidelines which control the manufacturer to follow correct strategy for manufacturing of drug.
- Students learn how to write and file the patent; how to document clinical data of the concern drug research.

Lab II: Biochemical Toxicology & Clinical Research and Nutrition Biochemistry

Experiment - 1	15
Experiment -2	15
Viva Voce	10
Record	10
Total	**50**

Biochemical Toxicology and Clinical Research

1. Determination of LD50 /LC50
2. Determination of metal content in samples
3. Determination of Biological Oxygen Demand
4. Determination of Chemical Oxygen Demand
5. Biomarkers of neurotoxicity of organophosphate compounds.
6. Quality validation of process associated with toxicology.
7. Food processing and fortification test.
8. Enzymes related toxicity testing.
9. Metal toxicity determination in dietary dairy products.
10. Artificial additives based toxicity testing from dietary substance.
11. Microorganism base testing of dietary products.
12. Fungus base testing of dietary products.
13. Secondary metabolites base testing of dietary products.
14. Neurotoxicology, Occupational toxicology.
15. Biomarkers of neurotoxicity of organophosphate compounds.

Nutrition Biochemistry

1. Nutritional value determination for dietary products and substances.
2. Qualitative/ quantitative estimation of carbohydrate, protein, fatty acid and vitamins etc.
3. Identification of Vitamins according to source based identification.
4. Identification of Minerals according to source based identification.
5. Minerals quantitative estimation test.
6. Caloric metric measurement for dietary substances.
7. BMR calculation.

8. Electrolyte measurement.

Books Suggested

1. Tietz Text book of Clinical Chemistry.
2. Clinical Chemistry by DF Calbreath.
3. Clinical Biochemistry by Varley.
4. Practical Biochemistry By S. P. Singh.
5. Practical Biochemistry by A.C. Dev.
6. Pharmacology by Rang and Dele.
7. Biochemistry and Molecular Biology of Antimicrobial Drug Action by Franklin, T. & Snow J. A.
8. Pharmacology by S. D. Seth.
9. Pharmacology by Tara V Shahbhag.
10. Pathology by Edward.
11. Pharmacology by M C Prabhakar.
12. Pharmacology by Arvind Arora.

COURSE OUTCOMES

1. The students will be able to learn about the classification and functional properties of blood components.
2. Students understand the coagulation, anti-coagulation mechanism of blood and its disorders.
3. Students understand the biochemical, clinical, pathological and diagnostic aspects of diseases.
4. Students understand about the dietary types, requirements, utilization and functions of different class of diet.
5. Students getting the knowledge about the nutrition deficiency related disorders and balance diet.

SYLLABUS

M. Sc. Biotechnology

2020-21

IV Semester Course

School of Environmental Biology

Awadhesh Pratap Singh University Rewa M. P.

M. Sc. Biotechnology (Choice base credit system)
A. P. S. University Rewa M. P.
Syllabus for Session 2020-21
The Scheme of Examination
First Semester

Paper Code	Paper Name	Course Type	E. A.	I. A.	Total Marks	Total Credits.
101	Cell Biology	Core	80	20	100	4
102	Biochemistry	Core	80	20	100	4
103	Molecular Biology	Core	80	20	100	4
104	*Applied Microbiology	Generic Elective	80	20	100	4
105	Practical	-	100	-	100	4
106	Comprehensive viva-voce	-	50	-	50	2
Semester Total					**550**	**22**

Second Semester

Paper Code	Paper Name	Course Type	E. A.	I. A.	Total Marks	Total Credits.
201	Bioinformatics and Biostatistics	Core	80	20	100	4
202	Immunotechnology	Core	80	20	100	4
203	Plant Biotechnology	Core	80	20	100	4
204	*Biophysical and Molecular Techniques	Generic Elective	80	20	100	4
205	Practical	-	100	-	-	4
206	Comprehensive viva-voce	-	50	-	-	2
Semester Total					**550**	**22**

Third Semester

Paper Code	Paper Name	Course Type	E. A.	I. A.	Total Marks	Total Credits.
301	Genetic Engineering	Core	80	20	100	4
302	Metabolism: Basic Concept And Design	Core	80	20	100	4
303	**(A)Bioprocess Engineering And Technology **(B)Medical Biotechnology	Discipline centric elective Discipline centric elective	80	20	100	4
304	*Environmental Biotechnology	Generic Elective	80	20	100	4
305	Practical	-	-	-	100	4
306	Comprehensive viva-Voce	-	-	-	50	2
Semester Total					**550**	**22**

Fourth Semester

Paper Code	Paper Name	Course Type	E. A.	I. A.	Total Marks	Total Credits.
401	Entrepreneurship In Biotechnology &Intellectual Property Rights	Core	80	20	100	4
402	**(A)Plant Tissue culture technology ** (B) Animal Cell Culture techniques	Discipline centric elective Discipline centric elective	80	20	100	4
403	Dissertation and Presentation		-	-	150	6
404	Comprehensive viva-Voce				50	2
Semester Total					400	16
Grand Total					**2150**	**84**

M.Sc. Biotechnology
Semester-I
Paper-101
Plant Tissue Culture

101: CELL BIOLOGY

Unit I

1. Concept of Cell: Prokaryotes and Eukaryotes (Plant and Animal Cell)
2. Cell Organelles (Nucleus, Mitochondria, Golgi complex, Endoplasmic reticulam (SER and RER), Chloroplast, Peroxisome and vacuoles)
3. Cell membrane: physiochemical properties; Molecular Organization- Biogenesis and Functions
4. Biogenesis of Mitochondria and Chloroplast

Unit II

1. Protein targeting and Molecular mechanisms of Vesicular transport, . Transport of small molecules across cell membranes: types and mechanisms.
2. Intracellular digestion: ultra structure and function of lysosomes Nutrient uptake and excretion. Transport by Vesicle formation: Endocytosis and Exocytosis.
3. Active transport by ATP powered pumps: types, properties and mechanisms.
4. Transport of proteins into Mitochondria and Chloroplast.

Unit III .

1. Cell Motility and Shape I: Structure and function of microfilaments, Microtubules and Intermediate Filaments.
3. Intra cellular communication through Cell Junctions: Occluding Junctions, Anchoring junctions and Communicating Junctions
4. Inorganic ions.

Unit IV

1. Molecular Mechanisms of Cell-Cell Adhesions: Ca dependent cell-cell adhesions.
2. Molecular Mechanisms of Cell-Cell Adhesions: Ca independent cell-cell adhesions.
3. Extracellular Matrix of animals: Organization and Functions.
4. Extracellular Matrix Receptors on animal cells: Integrins.

Unit V

1. Cell Signaling: Signaling via G-Protein linked and enzyme linked cell surface receptors, MAP kinase pathways, Interaction and Regulation of signaling pathways. Bacterial chemo taxis and quorum sensing.
2. Eukaryotic Cell Division Cycle: Different Phases and Molecular Events.
3. Control of Cell Division Cycle: In yeast and mammalian cells.
4. Apoptosis: Phases and significance, Morphological and Biochemical changes associated

   With apoptotic cells, Apoptotic Pathways and regulators
5. Cancer: Molecular basis of carcinogenesis, carcinogens (Physical, Chemical and Biological)

M.Sc. Biotechnology
Semester-I
Paper-102

102. Biochemistry

UNIT-1

1. Biochemistry: The molecular logic of living organisms
2. The cell and its biochemical organization
3. Intra and inter molecular forces electrostatic interactions and Hydrogen bonding interaction.
4. Vander Waals and Hydrophobic interactions, Disulphide bridges
6. Role of water and weak interactions
7. Chemical foundations of Biology- pH, pK, acids, bases, buffers, weak bonds & Covalent bonds, Principles of thermodynamics

UNIT-2

1. Carbohydrates: classification, structure, functions; homo and hetero polysaccharides,animal, plant and microbe specific polysaccharides.
2. Lipids: Classification, nomenclature, structure and property of fatty acids,Simple lipids- Triglisrids, fates and Waxes. Compound lipids- classification, structure, distribution, and biological importance, role of prostaglandine,leukotrins and thromboxans.
3. Sterols- Cholestrol, role in biological system. Tarpenes and phenols.
4. Functions; Lipids associated with disease, diagnosis and treatment. Lipoproteins and biological membrane, micelles and liposomes.

UNIT -3

1. Nucleic acids: Structure, Properties of purines and pyrimidine bases,DNA : Structure, conformation, prokaryotic and eukaryotic DNA, nucleotides,Chromosomal and extrachromosomal DNA
2. RNA: Structure, types and function of mRNA, tRNA, Ribozymes: structure and functions.
3. Amino acids- classification, structure, property, Zwitter ion, titration curve and biologically important amino acids
4. Polypeptides- Conformational properties of polypeptides, protein sequencing methods.
5. Proteins: Classification, Primary structure, nature of peptide bond, Ramchandran plot, and secondary structure, hydrogen bonding, salt bridge, disulphide bonds, hydrophobic and hydrophilic interaction in proteine and role of these bonds in protein folding, α-helix, β- sheet, and beta turns structures etc.Tertiary and quaternary structure. Biological role of proteins. Proteins associated with diseases, diagnosis and treatment. Separation, purification and criteria of homogeneity, End group analysis Folding-unfolding equilibrium and denaturation of proteins
6. Prions- Structure role and association with disease

.

UNIT-4

1. Enzymes; General characteristics and Catalytic power of enzymes and their classification, Energy considerations, Factors affecting enzyme activity, Enzyme kinetics, Michaelis-Menten equation, Allosteric enzymes and their regulation.
2. Methods of enzyme assay: Continuous & Sampling techniques, coupled kinetic assays, Significance of enzyme turn over number, Specific activity.
3. Enzyme purification techniques, Criteria of purity and tabulation of data Characterization of purified enzymes
4. Vitamins and cofactors: Structure, distribution, interaction and biological properties
5. Hormones- structure, distribution and function.
6. Phenols – structure and biological property
7. Alkaloids – structure and biological properties

UNIT -5

1. Enzyme immobilization: Experimental procedures and effect on kinetic parameters
2. Uses of enzymes in Industries, textiles, leather and food
3. Use of purified enzymes in Biosensors
4. Development of enzyme sensor for clinical diagnosis with specific examples

M.Sc. Biotechnology
Semester-I
Paper-104 (*__Generic Elective__)

APPLIED MICROBIOLOGY

Unit I

1 History and Scope of Microbiology, Microscopy (light microscopy, resolving power of different microscopes, ESR, ETR)
2. Classification of Microorganisms: Bacterial & Fungal Classification.
3. Morphology and fine structure of eubacteria, archebacterial cell wall and fungal cell Wall.
4. Cyanobacteria : General account and their economic importance
5. Mycoplasma and diseases caused by them

Unit II

1. Sterilization: Physical and chemical methods
2. Preparation of culture media, pure culture techniques and microbial staining
3. Microbial growth: Bacterial growth curve, Mathematical expression, measurement of growth and factors affecting growth.
3. Microbial Nutrition: Nutritional classification of Microorganisms, Different carbon and Nitrogen sources, mode of nutrition, transport of nutrition across the bacterial membrane.
4. Oxygen toxicity: Study of catalase, peroxidase, superoxide dismutase, mechanism of oxygen toxicity
5. Taxonomic classification of microbes using molecular markers- 16 rRNA typing.

Unit III

1. Virus organization, Types, Isolation, cultivation, identification and viral replication.
2. Structure and morphology of bacteriophages, lytic and lysogenic cycle.
3. Life cycle of DNA viruses: SV 40, RNA viruses: Retroviruses.
4. Plant viruses: TMV, Gemini, CMV, Human Viruses: Influenza (SARS), Herpes Simplex virus, Rubella.

Unit IV

1. Infection and disease, types of infection, Mechanism of pathogenesis of bacterial and Viral disease and its diagnosis
2. Staphylococcal and Clostridial food Poisoning, Bacterial Diseases: Salmonellosis and Shigellosis.
3. Fungal Diseases: Histoplasmosis, Aspergillosis and Candidiasis, diagnosis and treatment
4. Viral diseases: diagnosis and treatment of Chicken Pox, Hepatitis B and Poliomyelitis.

Unit V

1. Host microbe interaction, Symbiosis, Antibiosis, Commensalisms, Competition, Mycorrhiza and its importance, Role of microbes in N, P and C cycle.
2. Aerobic and anaerobic respiration, fermentation and bioprocess engineering
3. Chemotherapeutic agents: Classification of Antibiotics, Broad and narrow spectrum antibiotics; Antibiotics from prokaryotes.
4. Anti-fungal and antiviral antibiotics, mode of action of antibiotics and mechanism of drug resistance, origin of drug resistance.

M.Sc. Biotechnology
Semester-I

103- MOLECULAR BIOLOGY

Unit I

1. Mendelian Genetics-Principles
2. Human genetics (pedigree analysis, karyotypes and genetic disorder).
3. Nature of Gene Concept, Chemical Nature of Gene, Gene cistron relationship in Prokaryotes and Eukaryotes
4. DNA Replication: General features of Chromosomal Replication: and its Enzymology
5. Regulation of DNA replication

Unit II

1. Transcription in prokaryotes: Initiation, elongation and termination
2. Structure and Function of prokaryotic promoter
3. Control of transcriptional initiation in prokaryotes: Structure and function of RNA Polymerase: Sigma factors- Types and functions
4. Control of transcriptional termination: Attenuation and antitermination

Unit III

1. Regulation of gene expression in prokaryotes: Operon concept, induction and Repression, Structure and regulation of lactose, arabinose and tryptophan operons
2. Initiation of transcription in Eukaryotes: RNA Polymerases Types and properties
3. Transcription factors- Types and properties; Enhancers- Structure and properties; Response Elements
4. Post-transcriptional Modification Eukaryotes- 5' and 3' modification of mRNA
5. Molecular recombination

Unit IV

1. Post- transcriptional Processing of pre mRNA, pre rRNA and pre tRNA transcripts
2. Genetic Code: Evidence and properties; Wobble hypothesis; Transcriptional adaptors and amino acyl tRNA synthases.
3. Translation: Successive stages of protein synthesis in prokaryotes and its comparison with eukaryotes
4. Post-translational Modification: Types and Significance

Unit V

1. Regulation of Gene Expression in Eukaryotes: cis- acting DNA elements; Chromatin Organization and regulation of gene expression; regulation at the level of processing of Transcripts, RNA editing; Gene Alteration; DNA methylation and gene regulation; Regulation of gene expression by hormones, regulation of gene expression at translational level.
2. Transposable elements in Prokaryotes and Eukaryotes: Types and Significance
3. Oncogenes and Tumor Suppressor Genes: Properties and Significance
4. Mutation and DNA repair chromosomal aberration.

M.Sc. Biotechnology
Semester-II

201- BIOSTATISTICS AND COMPUTER APPLICATIONS

Unit I

1. Introduction to Biostatistics, Common terms, notions and Applications
2. Statistical population and Sampling Methods
3. Classification and tabulation of Data
4. Diagrammatic and graphical presentation
5. Frequency Distribution, Measures of central value
6. Measures of variability; Standard deviation, standard Error, Range, Mean Deviation, Coefficient of variation, Analysis of variance

Unit II

1. Basic tests, Test of significance; t-test, chi-square test.
2. Correlation and Regression; Basic of regression, regression analysis, Estimation, Testing, prediction, Checking and residual analysis.
3. Multivariate Analysis.
4. Design of Experiments, randomization, replication, local control, complimentary Randomized, randomized block design
5. Statistical Packages: SPSS, Graph pad etc

Unit III

1. Introduction to Information technology and computer
2. Office applications: MS- Office, MS- Word, MS- Excel and MS- PowerPoint
3. Introduction to data mining
4. Internet- introduction and application

Unit IV

1 . Over view of Bioinformatics: Merger of life sciences with computers.
2. Search engines: Google, Pub Med, NCBI, EMBL,
3. Protein and DNA databases: Swiss port, PIR, OMIM, Embank, ENTREZ, DDJB, MIPS,.
4. Sequence 4Databases: Contents, Structure, and annotation for Human Genome

Unit V

1. Databases, Plant Genome Databases, Retrieving and installing a programme (Tree Tool), Multiple sequence alignment programme - Clustal W , X. Genome analysis programs; BLAST, FASTA, CGC, Motif and profile Sequence search.
2. Phylogenetic analysis: Phylogenetic reconstruction, distance matrices, Parsimony, Philip.
3. Methods of prediction of Proteins, DNA, RNA, fold recognition, structure prediction
4. Computer aided drug designing: Basic principles, docking, ADME/TOX
5. Genome mapping applications: EST and Functional genomics
6. Use of genome analysis programs, primer designing tools.

M.Sc. Biotechnology
Semester-II

202--IMMUNOTECHNOLOGY

UNIT I

1. Immune response: Innate immune mechanisms and characteristics of adaptive immune responses, Hematopoiesis.
2. Anatomical organization of Immune System: Primary Lymphoid Organs, Secondary Lymphoid Organs, Ontogeny and Phylogeny of lymphocytes, Lymphocyte traffic.
3. Cell of immune system: Mononuclear cells and granulocyte, Antigen presenting cells, lymphocytes and their subsets. Antigens, Heptanes: Factor affecting immunogenecity, Super antigen.
4. Inflammation: its mediator and the process, cell-adhesion molecules

UNIT II

1. Major histocompatibility systems: Structure of MHC I and II molecules, polymorphism, distribution variation and function. Organization of MHC complex in mouse and humans. Association MHC with disease.
2. Recognition of antigens by T and B cells: Antigen processing, Role of MHC molecules in Antigen presentation and co stimulatory signals.
3. T-Cell receptor complex, T- Cell accessory membrane molecules, activation of T –cells, organization and arrangement of T-receptor genes.
4. B-cell receptor complex, activation of B-cells, Immunoglobulins: molecular structures, types and function. Antigenic determinants on immunoglobulins.

UNIT III

1. Molecular mechanism of antibody diversity: Organization of genes coding for constant and variable regions of heavy chain and light chain. Mechanism of antibody diversity, Class Switching.
2. Antigen-Antibody interaction avidity and affinity measurement.
3. Monoclonal antibodies: production, characterization and application in diagnosis, therapy and basic research.
4. Compliment System, components, Activation pathway and regulation of activation pathway, complement deficiency, role of complement system in immune responses.

UNIT IV

1. Cytokines: Structure and functions, cytokine receptors, signal transductions mediated by cytokine receptors, cytokine regulation of immune responses, cytokine related diseases and therapeutic applications of cytokines.
2. Cytotoxic T-cell and their mechanism of action, NK cell and mechanism of target cell destruction. Antibody dependent cell mediated cytotoxicity, delayed type hypersensitivity. Techniques of Cell-mediated immunity.
3. Immunoregulation by Antigens, Antibodies, immune complexes, MHC and cytokines.
4. Hypersensitivity: definition, IgE mediated hypersensitivity, mechanism of mast cell degranulation, mediators of type I reactions and consequences. Type II reactions, immune complex mediated hypersensitivity and delayed type hypersensitivity.

UNIT V

1. Autoimmunity: Organ specific diseases, systemic disease, mechanism of autoimmunity.
2. Immunodeficiency Syndrome: Primary Immunodeficiencies and Secondary Immunodeficiencies and their diagnosis and therapeutic approaches.
3. Vaccines: Active and passive immunization, whole organism vaccines, macromolecules as vaccines, Recombinant vector Vaccines, DNA Vaccines, synthetic peptide Vaccines and sub-unit Vaccines.
4. Immunodiagnostics: development of Immunodiagnostic Kits for infectious and non-Infectious disease with examples. Precipitation techniques, Agglutination, Fluorescence Techniques, ELISA, RIA, Western Blotting and immuno-histochemical techniques.

M.Sc. Biotechnology
Semester-II

203- Environmental Biotechnology

UNIT I

1. Environment: basic concepts, Environment pollution: types, methods for measurement of pollution
2. Population ecology(R & K selection)
3. Community ecology,
4. Waste treatment & Utilization: solid waste management, Waste water management
5. Biomedical waste and its management

UNIT II

1. Xenobiotics and its degradation
2. biosurfactants and biofilms
3. Integrated pest management- An ecological approach
4. Bioremediation: In -situ and ex -situ techniques, advantages of bioremediation, Applications of genetically engineered microbes (GEM) in bioremediation.
5. Phytoremediation: Types and its applications

UNIT III

1. Environmental monitoring: Bioindicators
2. Biogeography
3. Global environmental problems (Global warming, ozone depletion and kyoto protocol) and their management
4. Petroleum biotechnology

UNIT IV

1. Biotransformation: Steroids
2. Mushroom Cultivation
3. Biofertilizers and its applications
4. Immobilization of microbial cells (Biofilms) and their applications
5. Biopesticide and its applications.

UNIT V

1. Conservation biology (principle of conservation, Indian case studies on conservation, project tiger and biosphere reserve, National Parks and sanctuaries)
2. Microbial production of SCP
3. Bioleaching, Concept of Green Energy
4. Environmental Protection act: legal issues and current scenario

M.Sc. Biotechnology
Semester-II
(***Generic Elective**)

204- Biophysical Chemistry – Techniques

Unit-1

1. Concept of free energy of molecules. Introduction to various force fields and their relative merits and demerits. Techniques for Molecular energy minimization, Monte Carlo and Molecular Dynamics simulation.
2. Water, PH, Buffer, Handerson and Hasselblach equation.
3. Titration of weak acid and weak bases
4. Basic calculation of concentration of deferent unit
5. Mass Spectrometry

Unit-2

1. Micro calorimetry (DSC and ITC) and its application
2. Circular Dichroism spectroscopy
3. UV, visible and Fluorescence spectroscopy, IR and Raman Spectroscopy
4. X-Ray Diffraction
5. Nuclear Magnetic Resonance (NMR)
6. ESR
7. Mass Spectroscopy

Unit-3

1. Ion exchange chromatography
2. Affinity Chromatography,
3. Paper chromatography
4. Thin layer chromatography
5. Gas liquid chromatography
6. Gas chromatography
7. Column chromatography
8. HPLC
9. Exclusion chromatography
10. Isoelectrofocusing

Unit - 4

1. Analytical Ultracentrifugation: Sedimentation velocity and equilibrium, determination of molecular weights
2. Electrophoresis of DNA, proteins and enzymes.
3. Southern, northern and western blotting
4. DNA Fingerprinting
5. Tracer Techniques – Nature and types, Decay units and preparation of labeled biological compounds.

Unit-5

1. DNA sequencing
2. Gene mapping techniques
3. Functional genomics (expression profiling, transcriptome, DNA array, gene function determination , protein interaction)
4. EMSA and FACS and Flow cytometry
5. PCR and its different variations, Analysis of molecular markers(SSLP , RFLP, AFLP, RAPD, ISSR, STS)

M.Sc. Biotechnology

Semester-III

301- GENETIC ENGINEERING

Unit I

1. The recombinant DNA Technology : General concept and principle of cloning
2. Enzymes: Nucleases and restriction endonucleases- properties and types; phosphomonoesterases; polymerase; terminal deoxynucleotidyl transferase; poly A polymerase, Linkers, adaptors and homopolymer tailing.
3. prokaryotic host- vector system: Characteristics of E.coli as host; vectors for cloning in E.coli (plasmid, bacteriophage- EMBL, DASH, gt10/11, ZAP etc and plasmid-phage)
4. Other Prokaryotic host vector systems: BAC, Characteristics of Gram positive and Gram negative organism as host and suitable vectors for cloning; Shuttle Vectors

Unit II

1. Design and characteristics of expression vectors for cloning in prokaryotes and factors that affect expression.
2. Cloning in Yeast: Properties of yeast as host for cloning and different types of vectors designed for cloning in yeast
3. Cloning in animal system: Animal system as a model host, Methods of introduction of foreign DNA in animal system; Vectors for cloning in animal system- SV-40, vaccinia virus, baculovirus and retrovirus vectors ,pMal, GST, pET based vectors, Pichia based vectors.
4. Plant transformation technology: Features of Ti and Ri plasmids, mechanism of DNA transfer.

Unit III

1. Methods for Constructing rDNA and cloning: Inserts; vector insert ligation; infection, transferring and cloning
2. Methods for screening and selection of recombinant clones
3. DNA Libraries: types, advantages and disadvantages of different types of libraries; Different methods for constructing genomic and full length cDNA libraries
4. Gross anatomy of cloned insert- size, restriction mapping and location

Unit IV

1. Fine anatomy of DNA segment- General principle of chemical and enzymatic methods of nucleotide sequence analysis and advantages of automatic gene sequencers.
2. Localization of cloned segments in genomes- molecular and chromosomal location
3. Methods for determination of copy number of a cloned gene in genome
4. Mutant construction: Introduction, deletion, insertion and point mutation

Unit V

1. Principles and applications of Blotting techniques- Southern, Northern, Western and Eastern blotting; Polymerase Chain reaction and types (multiplex, nested, RT, real time, touch down PCR, hot start PCR, colony PCR), Oligonucleotide
2. Principle and applications of gel mobility shift assay, DNA fingerprinting and DNA Foot printing, restriction fragment length polymorphism, Chromosome mapping and chromosome painting
3. Application of Recombinant DNA technology in Medicine & Industry
4. Si RNA technology: Micro RNA Construction of Si RNA vectors: Gene silencing and its applications in agro industry.

M.Sc. Biotechnology
Semester-III

302- Metabolism: Basic Concept and Design

Unit-1

1. Basic concept, laws of thermodynamics, ATP role in metabolism, oyher high energy phosphate molecule.
2. Mechanism of Enzyme catalysis and action, Enzyme inhibition, activation of enzymes
   Immobilized enzymes
3. Different mechanisms of enzyme catalysis acidbase and covalent catalysis
4. Molecular mechanism of action of chymotrypsin, Lysozyme and carboxy peptidase
5. Structure-function relationship of enzymes

Unit-2

1. Glycolysis: Key structure and reactions, formation of1,6 bisphosphate, formation of glyceraldehyde 3-phosphate, formation of pyruvate and generation of second ATP, entryof fructose and galactose into glycolysis, phosphofructokinase as key enzyme in glycolysis,hoxokinase and pyruvate kinase as regulatory enzymes, conversion of pyruvate into ethanol lactate or acetyl CoA.
2. Gluconeogenesis: Synthesis of carbohydrates by noncarbohydrate precursors, gluconeogenes is nota reversal of glycolysis, activation of pyruvatecarboxylase by acetyl CoA, oxaloacetate shuttle,energy consumption in the synthesis of glucose from pyruvate, reciprocal regulation of gluconeogenesis and glycolysis, conversion of lactate and alanine into glucose
3. Pentose phosphate pathway : Generation of NADPH and interconnection of glycolysis and pentose phosphate pathway, control of rate of pentose phosphate pathway by NADPH+, regulation of flow of glucose 6 phosphate by the need of NADPH, ribose 5 phosphate and ATP, glucose 6 phosphate dehydrogenase defficiency.

Unit-3

1. Electron transport and oxidative phospherylation, energetics of oxidative phosphorylation, enrgy yield by complete oxidation of glucose.
2. Citric acid cycle: Formation of acetyl CoA from pyruvate, condensation of oxaloacetate with acetyl CoA to form citrate, isomerization of citrate intoisocitrate, oxidative decarboxylation of succinyl CoA, generation of high energy phosphate from succinylCoA, regeneration of oxalate, sloichiometry of citricacid cycle, pyruvate dehydrogenase complex, citricacid cycle as a source of biosynthetic precursors, control of pyruvate dehydrogenase complex, controlof citric acid cycle, citric acid cycle and its high energy yield. Carbohydrate Metabolism: Photosynthesis, C_3, C_4 & CAM plants. **Unit-4**

1. Fatty acid oxidation
2. Digestion, mobilization and transport of fatty acids, Mobilization of stored triglycerides by hormones, activation of fatty acids and their transport tomitochondria, oxidation of saturated fatty acids, Oxidation of unsaturated fatty acids, and oxidation of odd chain fatty acids. Ketone bodies, over production of kelone bodies.
3. Biosynthesis of fatty acids

4. Formation of malony CoA, fattyacid synthase complex, fattyacid synthase multifunctional proteins, shuttling of acitate out of mitochondria as citrate, Reactions of fatty acidsynthase, regulation of fatty acid biosynthesis, Biosynthesis of triglycerols, membrane phospholipids and prostaglandins.

Unit-5

1. Amino acid degradation oxidative deemination, conversion of NH_4 into urea, linkage between ureacycle and citirc acid cycle, conversion of alanineserine and cystein into pyruvate, conversion of aspartate and asparagine into oxalocetate, conversion of several amino acid into alpha ketoglutarate through glutamate, succinyl CoA as a point of entry for some amino acids, leucine degradation to acetylCoA and acetoacetyl CoA, phenyl alanine degradation to acetoacetate and fumarate.
2. Biosynthesis of amino acids : Conversion of nitrogen to NH_4 by micro-organisms, conversion of amonia into amino acids by way of glutamata and glutamine,conversion of citric acid Intermediates to amino acids,glutamate as precursor of glutamine, proline and arginine, conversion of 3-phosphoglycerate to serine, synthesis of cystein from serine and homocysteine,feed back regulation of amino acid biosynthesis.
3. Biosynthesis and degradation of Nucleotides:
   Purine biosynthesis : formation of PRPP, Biosynthesis of IMP, Purine nucleotide interconversions, regulation of purine biosynthesis.
   Pyrimidine Biosynthesis : Assembly of the pyrimidinenucleus, synthesis of di & tri phosphates, formation of deoxyribonucleotides, thymine biosynthesis salvage pathway for purine and pyrimidine nucleotides, Degradation of purines and pyrimidines to uric acid and urea.

M.Sc. Biotechnology
Semester-III
(**Discipline centric elective)
Paper-303(A)

303 A : BIOPROCESS ENGINEERING AND TECHNOLOGY

UNIT I

1. Introduction to bioprocess engineering
2. Isolation, preservation and Maintenance of Industrial microorganisms.
3. Kinetics of microbial growth and death,
4. Media for industrial fermentation. Air and media sterilization

UNIT II

1. Aeration and Agitation systems for bioreactor
2. Safety in fermentation laboratory
3. Strain improvement of industrially important microorganism.
4. Bioreactors: Principle, Kinetics, types, design, and application.

UNIT III

1. Flow behaviour of fermentation fluids
2. Gas-Liquid mass transfer, significance of Ka, and Heat transfer.
3. Automation for monitoring and control.

UNIT IV

1. Downstream processing: Introduction, removal of microbial cells and solid matter, foam reparation, precipitation, centrifugation, cell disruption, chromatography
2. Extraction:-solvent, two phase, liquid extraction
3. Product recovery processes
4. Crystallization, packaging and quality assurance.
5. Classification of product formation
6. Product synthesis kinetics

UNIT V

1. Microbial Production of antibiotics: Penicillin;
2. Microbial Production of Vitamins & amino acids (Vit B12 & Glutamic acid)
3. Microbial production of enzymes: Amylase,
4. Microbial production of alcoholic beverages: Distilled alcoholic beverages-Beer, microbial production of Vinegar.
5. Microbial production of Organic acids: Citric acid & Acetic acid
6. Microbial production of solvents: Ethanol and acetone
7 Microbial production of food –SCP

M.Sc. Biotechnology
Semester-III
Paper-303(B)
(**Discipline centric elective)
Medical Biotechnology

UNIT I

Biotechnology in medicine: History, scope & importance of Biotechnology in medicine Disease Diagnosis (DNA, RNA probes), Detection and Treatment of genetic Diseases.

Genetic Counseling and Forensic Medicine: Fertility control, Genetic counseling, (Chance of having child with congenital defects, choice of Baby sex)

DNA Fingerprinting in Forensic Medicines.

UNIT 1I

Gene therapy: Definition and types of Gene therapy, Initial success and future of Gene therapy, Vectors and other delivery system of gene therapy, Target tissue for gene therapy system, Gene therapy of genetic diseases(Neurological Disorders, Cystic Fibrosis),Gene therapy of Acquire diseases(Infectious Diseases, Cardiovascular diseases, cancer), Nanobiotechnology for drug targeting and gene therapy.

UNIT III

Pharmaceutical Biotechnology: Drug development, drug manufacturing processes, manufacturing processes of antiviral drugs, drug designing, Novel drug delivery systems, Antimicrobial drugs.

Pharmacogenetics: Pharmacogenetics and personalized medicine, genetics and genomics in medical practice, use of SNPs in pharmocogenomics.

UNIT IV

Genetic Engineering: Genetic and recombinant vaccines; Edible vaccines production of therapeutic proteins; Genetic engineering for production of Factor VIII, tissue plasminogen activator, Interferon.

Tissue Engineering: Tissue engineering of skin and cartilage and their applications, properties and types of stem cells, culture and applications of stem cells, Transplant rejection, Intellectual property issues in using human embryonic stem cells.

UNIT V

UNIT IV

Drug Discovery and Designing: History and molecular aspects of drug discovery, drug discovery in cancer, microbial genomics for new antibiotics, drug designing.

Metabolic engineering: Cloning and expression of heterologous genes, molecular breeding of Bio synthetic pathways, metabolomics and metabolic engineering, limitations in metabolic engineering.

Monoclonal Antibodies auto Antibodies

M.Sc. Biotechnology
Semester-III
(*Generic Elective)

304 PLANT BIOTECHNOLOGY

Unit I

1. Objectives, roles, landmark and new challenges in plant breeding.
2. Plant breeding techniques: Mutational breeding and distant hybridization.
3. Generation of genetically modified crops for resistance against biotic and abiotic stresses and nutritional quality.
4. Seed production techniques: release of new varieties.

UNIT II

1. Germplasm Conservation and maintenance
2. Plant Pathology overview and future perspectives
3. Organic farming: Methods and management
4. Hydroponics and aeroponics

UNIT III

1. Somaclonal variation and its application for plant improvement
2. Protoplast isolation and fusion, selection of hybrid cell and cybrids
3. Cryopreservation techniques and application
4. GM crops (development and future aspects.)

UNIT IV

1. Plant cloning vectors: ti Plasmid and viral vectors (CaMV based vectors, Gemini viruses,
2. TMV based vectors, Antisense RNA and ribosome technology
3. Transgenics in crop improvement: Methods for gene transfer field, Chloroplast transformation, testing and commercialization.
4. Plant physiology, plant hormones, stress physiology, secondary metabolites, photoperiodism and vernalization,solute transport and translocation.

UNIT V

1. Plant Genome mapping: Physical and molecular maps , Gene tagging
2. Insect resistance, Bt genes, Non-Bt like protease inhibitors, alpha amylase inhibitor, green House technology
3. Seed production techniques, release of new varieties and plant breeders' right: UPOV 369, 370,372.
4. Intellectual property right (IPR) and protection (IPP, Patenting of Biological material .

M.Sc. Biotechnology
Semester-IV

401: ENTREPRENEURSHIP IN BIOTECHNOLOGY &INTELLECTUAL PROPERTY RIGHTS

Unit 1

1. Creativity & Entrepreneurial personality and Entrepreneurship in Biotechnology Organizational structure & Management, Capital Management, Product innovation and management Government schemes for commercialization of technology (e.g. Biotech Consortium)

Unit 2

1. Basics of production management: Methods of manufacturing-Project/Jobbing, Batch Production, Flow/Continuous production, process production-Characteristics of each Method. Plant location-Importance-Factors affecting location-factory Building-Plant Layout- Installation of Facilities.
2. Operational Research: Linear Programming, PERT and CPM; Production Planning & Control-Scheduling-Gantt Charts-Documentation-Production Work Order.
3. Basics of material management
4. Personnel management E.g., Communication skills; Managerial and personal, training ,etc.

Unit 3

1. Kaizen (Continuous improvement in product & management)
2. Six Sigma
3. Biotech enterprises: Small, Medium & Large
4. Quality control in Biotech industries

Unit 4

1. Govt. regulations for biotech products
2. Public policy, regulatory and ethical challenges facing the biotechnology Entrepreneurship
3. Business development for medical products
4. Business development for consumable products

Unit 5

1. Patenting System: WTO, Paris Convention, Indian Legislations
2. Intellectual Property: A. Copy Right & Industrial Properties, Trademarks, Designs, Geographical Indications
3. IPR & Technology transfer, Role of patentee & Licensor
4. Patent process & Patent laws & e-filing

M.Sc. Biotechnology
Semester-IV
Paper-402-A
(**Discipline centric elective)
Animal Cell culture

UNIT I

Animal cell and tissue culture: History and scope of animal biotechnology and genomics, advantage and Laboratory Facilities

Introduction and organization of animal cell and tissue culture laboratory for Cell and Tissue Culture, Substrate, Culture Media and Procedures for Cell and Tissue Culture, Primary cell Culture and Cell Lines,

Stem Cells: Introduction, Origin, Types and functions of Stem Cells, Therapeutics, cloning for embryonic stem cells, Stem Cell Therapy.

UNIT II

1. Primary and established cell line cultures
2. Serum and protein free defined media and their applications
3. Introduction to balanced salt solutions and simple growth medium: rationale of composition of medium, role of CO2 and supplements

4.Organ/Embryo Culture: Primary Tissue Explanation Techniques, Organ Culture, Embryo Culture.

5.Cell and Tissue engineering: Approaches and Bio-Materials for tissue engineering, Tissue engineering of skin (Skin Graft), Engineering of Bone Crafts and Artificial Nerve Crafts, Future Limitations and Possibilities of Tissue Engineering.

UNIT III

In Vitro Fertilization and Embryo Transfer: In Vitro Fertilization in Human, Embryo Transfer (ET) in Humans, Super Ovulation and Embryo Transfer in Farm Animals (e.g. Cow).

Cloning of Animals: Method, Types and utility of cloning animals, Cloning for Production of Transgenic Animals, Human Cloning and Ethical issues and Risk.

UNIT IV

Transgenic Animals: Gene Transfer or Transfection (Transfection of embryo, unfertilized eggs, culture of mammalian cells), Transgenic Animals, Cryopreservation. Measurement of parameters of growth, Scaling up of animal cell culture, Cell synchronization, 3-D animal cell culture, 4. FISH and applications of animal cell culture

UNIT V

Molecular Maps: Genetic Maps Using Molecular Markers, Cytogenetic Maps Using Molecular Markers, Physical Maps Using Molecular Markers.

Genomics and Proteomics: Human Genome project, Progressing Genomic Research (Drosophila, Mouse, Rat, Chimpanzee), Integrated Genomic Maps and Linkage Disequilibrium, Maps of the Future, Introduction types and application of proteomics.

M.Sc. Biotechnology
Semester-IV
Paper-402 (B)
(**Discipline centric elective)
Plant Tissue Culture

UNIT I

Plant Tissue Culture: Basic aspects of plant biotechnology (History, application, scope and importance), laboratory

Sterlization techniques

Culture media for plant tissue culture, cell Culture and its applications.

Clonal Propagation and Protoplast Culture: Micro propagation

UNIT II

Somaclonal Variation, Protoplast isolation, Regeneration of plant, Somatic Hybridization Gene Transfer in Plants: Vectors of gene transfer (Plasmids, Agrobacterium and Virus vector) Transformation technique (Agrobacterium mediated gene transfer, DNA mediated gene transfer (DMGT) Removal of selected Marker Genes from Transgenic Plants, Regulatory sequences of induced genes.

Transgenic Plant resistance against Stress: Development of herbicide resistant transgenic plant, Development of insect resistant transgenic plant, Transgenic plant resistance against virus, bacterial and fungal pathogens, transgenic plant resistance against abiotic stress.

UNIT III

Production of virus free plants

Haploid production: ovary and anther culture

Genetically Modified Crops and Floricultural Plants: Transgenic plants with improved crop productivity, Transgenic plants with improved nutritional quality, Transgenic plants for Floriculture. Molecular Farming:

Transgenic Plants for Value Added Specialty Crops, Transgenic Plants for Edible Vaccines, Transgenic Plants for Antibodies and Transgenic Plants for Biopharmaceuticals

UNIT IV

Transgenic Plants for Biosafety: Biosafety regulations of Transgenic Crops, Commercialization of Transgenic plants, quality modifications of plants (Modification of starch quality, modification and future of oil quality and modification of seed protein quality).

Choloroplast Engineering: plants Engineering of Chloroplast Genome, Transformation of choloroplast genome in higher plants, Transplastomic Plants and its applications (in Tabacco, Patato, Rice, Tomato etc.)

UNIT V

Protoplasm fusion

Construction of Molecular Maps: Preparation of Genetic Maps, (cereals, millets, sugarcane, cotton, Soyabean, Pea, Sunflower, etc.), Molecular genetics maps of high density plants, Uses of molecular genetics maps.

Genomics: Microcllinearity in DNA Sequences of Small Genomic Regions, Thale cress genome, Rice (Oryza Sativa)

Syllabus

M. Sc. Microbiology

2020-21

Four Semester Course

School of Environmental Biology

Awadhesh Pratap Singh University Rewa M. P.

Scheme of Examination

M.Sc. I[st] Semester

M.Sc. Ist Semester No. of papers.	Name of papers	Course type	**Theory**	**I. A.**	Total	Total Credit.
MB:101	Introduction to Microbiology and General Bacteriology	Core	80	20	100	4
MB:102	Virology and Mycology	Core	80	20	100	4
MB:103	Cell Biology and Biochemistry	Core	80	20	100	4
MB:104	Microbial Genetics and Molecular Biology.	Generic elective	80	20	100	4
MB:105	practical		100		100	4
	Comprehensive viva voce		50		50	2
			Total		**550**	**22**

M.Sc. IInd Semester

M.Sc. IInd Semester No.of papers.	Name of papers	**Course type**	**Theory**	**I. A.**	Total	**Total Credits**
MB:201	Bioinstrumentation	Core	80	20	100	4
MB:202	Immunology	Core	80	20	100	4
MB:203	Microbial Technology	Core	80	20	100	4
MB:204	Biostatistics , Computer Fundamentals and Bioinformatics.	Generic elective	80	20	100	4
MB:205	practical		100		100	4
MB:206	Comprehensive viva voce		50		50	2
			Total		**550**	**22**

M.Sc. IIIrd Semeter

M.Sc. IIIrd Semeter No.of papers.	Name of papers	**Course type**	**Theory.**	**I. A.**	Total	**Total Credits.**
MB:301	Medical Microbiology	Core	80	20	100	4
MB:302	Recombinant DNA Technology	Core	80	20	100	4
MB:303	Environmental Microbiology Or Microbial diagnosis in health clinics	Discipline centric elective	80	20	100	4
MB:304	Microbial Physiology and Metabolism	Generic elective	80	20	100	4
MB:305	practical		100		100	4
MB:306	Comprehensive viva voce		50		50	2
			Total		**550**	**22**

M.Sc. IVth Semester

M.Sc. IVth Semester No.of papers.	Name of papers	**Course type**	**Theory**	**I. A.**	Total	**Total Credit.**
MB:401	Agriculture microbiology	Core	80	20	100	4
MB:402	Food microbiology Or Enzyme technology	Discipline centric elective	80	20	100	4
MB:403	Project work of 3-4 months duration		150		150	6
MB:404	Comprehensive viva voce		50		50	2
			Total		400	16
					2150	**82**

M.Sc. Ist Semester

MB: 101 INTRODUCTIONS TO MICROBIOLOGY AND GENERAL BACTERIOLOGY

UNIT-I

1. Introduction and history of Microbiology and scope of Microbiology.
2. Microorganism: their general characteristics and composition of microbial world; Prokaryotes and Eukaryotes.
3. Classification of Microorganisms: Haekel's three kingdom concept, Whittaker's five kingdom concept, three domain concept of Carl Woese , classification and salient features of bacteria according to Berger's Manual of Determinative Bacteriology.
4. Nomenclature and modern method of Bacterial taxonomy.

UNIT-II

1. Morphology and ultra structure of bacteria : size, shape, and arrangement of bacteria, ultra structure of bacterial cell wall of eubacteria and archeobacteria , relation of Gram staining to bacterial cell wall. Protoplast and spheroplast formation and L-form.
2. Structure and function of flagella, fimbriae and pilli, capsule- type, composition and function , slime layers, S-layers.
3. Cell membrane- structure and function of bacteria and archeobacteria , mesosomes , ribosomes, nucleoid , cytoplasmic inclusion bodies- polyhydroxy butyrate, polyphosphate granules, oil droplets, cynophycin granules.
4. Endospore: structure, formation and germination of bacterial endospore . Chemotaxis and phototaxis.

UNIT-III

1. Bactrial nutrition: Basic nutritional requirements, growth factors, nutritional categories, physical requirements of bacterial growth.
2. Bacteriological media: types (complex, synthetic, differential and selective media) and their uses, culture characteristics of bacteria on different media.
3. Cultivation of bacteria: aerobic and anaerobic culture, shaker and still culture, maintenance and preservation of microbial culture.
4. Bacterial growth: growth kinetics, growth curve. Batch, continuous and synchronous culture. Measurement of growth and influence of environmental factors affecting growth.

UNIT-IV

1. General concept of Prokaryotic and Eukaryotic genome. E.coli chromosome.
2. Genetic recombination and transformation.
3. Transduction : generalized and specialized transduction, phage conversion.
4. Plasmid: types and their significance. Conjugation and chromosomal mobilization. E.coli as a model prokaryotes.

UNIT-V

1. Control of microorganisms: Microbial death curve, concept of bioburden, thermal death time and decimal reduction time. Factors influencing the effectiveness of antimicrobial agents.
2. Control of microorganisms by physical agents: heat , filtration and radiation.
3. Chemical control of microorganisms : Halogens, phenol and other phenolic compounds, heavy metals, alcohols, ethylene oxide and aldehydes.
4. Antibiotics: properties and mode of action, drug resistance and its significance. Antimicrobial sensitivity test.

M.Sc. Ist Semester

MB: 102 : VIROLOGY AND MYCOLOGY

UNIT-I

1. Brief outline on discovery and origin of viruses.
2. General properties of viruses, morphology and ultra structure of viruses, capsid and their arrangements, types of envelopes and their composition, measurement of viruses.
3. Viral genome; their types and structure, viral related agents-viroids and prions.
4. Classification and general properties of major families of viruses including detail account of their mode of replication.

UNIT-II

1. Cultivation of viruses- in embryonated eggs, experimental animals and cell lines; primary and secondary cell lines, diploid cell culture.
2. Assay of viruses: physical and chemical methods (protein , nucleic acid, radioactivity tracers, electron microscopy, plaque method, pock counting and end point method.)
3. Serological methods: hemagglutination, hemagglutination inhibition, neutralization test, complement fixation, ELISA, RIA and immunoflourescence assay (IFA).
4. Purification of viruses: gradient centrifuge, electrophoresis, and chromatography.

UNIT-III

1. Plant viruses: recent advance in classification of plant viruses. Structure and pathgenicity of TMV.
2. Transmission of plant viruses with vector (insect, nematodes and fungi) and without vector (contact, seed and pollens). Biochemical changes induced by virus in plant cell.
3. Animal viruses: nomenclature and classification of animal viruses. Host responses to viral infection.
4. General idea about Cyanophage, Actinophage, and Mycophage.

UNIT-IV

1. Bacteriophage: classification, morphology and ultra structure.
2. One step growth curve (latent period, eclipse period, and burst of size.)
3. Life cycle : lytic and lysogenic life cycle of bacteriophages.
4. Brief account of M13, Mu, T3, T4, f x 174 and lamda phage.

UNIT-V

1. Structure, reproduction and classification of fungi, general characteristics of Zygomycetes, Ascomycetes, Basidiomycetes, and Duteromycetes.
2. Cultivation of fungi, culture media for fungal growth, effects of environment on growth, isolation, identification and preservation of fungi.
3. Dimorphic fungi, yeast morphology, general characteristics and reproduction. Lichens, Micorrhiza, and Actinomycetes.
4. Ecology of fungi: concept of fungistatis, fungicidal, antagonism, symbiosis and Synergism.

M.Sc. Ist Semester

MB: 103- CELL BIOLOGY AND BIOCHEMISTRY

UNIT-I

1. Cell: size, shape, types & chemical composition of the cell.
2. Structural organization and function of intracellular organelles of eukaryotic cell: nucleus, mitochondria, golgi body, lysosomes, endoplasmic reticulum, peroxisomes, plastids, chloroplast, vacuole, cytoskeleton.
3. Membrane structure and function: molecular organization of cell membrane, membrane models, mechanisms of intracellular transport.
4. Cellular interaction: differentiation of cell membrane and intracellular communication and Gap junction.

UNIT-II

1. Cell differentiation: general characteristics of cell differentiation and cytoplasmic factors, differential gene action.
2. Cell signaling: cell surface receptors, G-protein, signal transduction pathways.
3. Cell cycle: mitosis and meiosis and their regulation. Programmed cell death and appoptosis.
4. Cancer biology: characteristics of cancer cell, types of cancer, oncogene and Tumor markers.

UNIT-III

1. Carbohydrates: structure of sugars, classification, properties, chemical reactions, stereoisomerism and optical isomers of sugars.
2. Structure, properties and function of disaccharides, oligosaccharides, and polysaccharides, carbohydrate derivatives; peptidoglycan, glycoproteins, glycolipids.
3. Lipids : classification, structure, properties and functions of fatty acids, triacylglycerols, phospholipids, sterols and terpenes.
4. Lipids with specific biological functions, micelles and liposomes.

UNIT-IV

1. Amino acids: structure, classification, properties and functions.
2. Proteins : structural and functional proteins, synthesis of peptide bonds. Primary, secondary, tertiary and quaternary structure of proteins.
3. Nucleic acids: structure and properties of purines and pyrimidine bases, nucleosides and nucleotides.
4. Basic structure and types of DNA and RNA.

UNIT-V

1. Enzymes: basic concept as a biocatalyst, specificity, active sites, activity unit and isoenzymes, enzyme classification.
2. Enzyme kinetics- Michaelis-Menton equation for simple enzymes, determination of kinetic parameters.
3. Enzyme inhibition: competitive, noncompetitive and uncompetitive inhibition, allosteric enzymes.
4. Vitamins and cofactors: structure, distribution and biological properties.

M.Sc. I[st] Semester

MB : 104 MICROBIAL GENETICS AND MOLECULAR BIOLOGY
(Generic Elective)

UNIT-I

1. Organization of genetic material in prokaryotes and eukaryotes.
2. Concept of gene, genome, genome size, C-value, and C-value paradox.
3. Nucleic acid as a genetic information carriers; experimental evidence. DNA denaturation and renaturation.
4. Gene is a unit of mutation and recombination; molecular basis of mutations, physical and chemical mutagens, spontaneous and induced mutation, selection of mutant.

UNIT-II

1. DNA damage and repair: types of DNA damage (deamination, oxidative damage, alkylation and pyrimidine diamers.), repair mechanism; mismatch repair, nucleotide excision repair, recombination repair, SOS repair.
2. Structure of DNA, super helicity of DNA, linking number, topological properties and role of topoisomerase.
3. DNA replication: general principle, various mode of replication, unwinding of DNA Helix, continuous and discontinuous synthesis of leading and lagging strands.
4. Enzymes of DNA replication in prokaryotes and eukaryotes; DNA polimerases, DNA ligase, primase.

UNIT-III

1. Structural features of RNA (rRNA, tRNA, mRNA) and polycistronic and monocistronic RNA.
2. Transcription: general principle and processes of transcription; initiation, elongation and termination, types of RNA polymerases, inhibitors of RNA synthesis.
3. Control of Transcription by interaction between RNA polymerases and promoter region, use of alternate sigma factors, controlled termination; attenuation and antitermination.
4. Post transcriptional modification, maturation and splicing of RNA transcripts, catalytic RNA.

UNIT-IV

1. Genetic code: nature of genetic code, codon, anticodon, wobble hypothesis.
2. Protein synthesis: steps, details of initiation, elongation and termination.
3. Inhibitors of protein synthesis: signal hypothesis.
4. Post translational modification: covalent modification, phosphorylation, glycosylation, methylation.Protein targeting.

UNIT-V

1. Regulation of gene expression: operon concept; regulatory and structural gene, operator, promoter, represser , induction and repression, positive and negative control.
2. Lac-operon, ara-BAD operon, trp operon, attenuation, mechanism of regulation of transcription.
3. Regulation of gene expression in eukaryotes: Britton and Davidson's model of regulation involve HCP and NHCP and hormones.
4. Transposable elements.

M.Sc.II[Ind] Semester
MB : 201 BOINSTUMENTATION

UNIT-I

1. Microscopy: history and principles of microscopy, magnification power, Resolution limit, resolving power, numerical aperture.
2. Principles and application of light microscopy, properties of light, bright field, dark field, phase contrast and fluorescent microscopy. Determination of size of microorganisms by micrometery.
3. Principles and application of electron microscopy- transmission and scanning electron microscopy.
4. Newer techniques in microscopy- confocal microscopy, scanning probe microscopy (scanning tunneling microscope and atomic force microscope).

UNIT-II

1. Concepts of acids and bases, pH, measurement of pH by uses of indicator and electronic meter, buffersystem.
2. Chromatography: principles, types and applications of partition, adsorption, gel filtration, paper and thin layer chromatography.
3. Affinity, ion exchange, and gas chromatography.
4. High performance liquid chromatography and FPLC.

UNIT-III

1. Electrophoresis: principle, types and applications, frontal and zonal electrophoresis, paper, starch gel, Polyacrylamide and agarose gel electrophoresis.
2. Isoelectric focussing and Isotachophoresis.
3. Two dimentional gel electrophoresis and pulse field gel electrophoresis.
4. Immunological techniques: immunoelectrophoresis , immunodiffusion, immuno fluoroscence.

UNIT-IV

1. Spectroscopy: basic principles, low of absorption and radiation, principles and application of visible,ultraviolet, infrared and mass spectroscopy.
2. Principles and application of NMR and ESR.
3. Principles and application of colorimetry, fluorscence flame photometry.
4. Fluorimetry , polarimetry and turbidometry.

UNIT-V

1. Centrifugation: basic principles of analytical and preparative centrifuge, differential and density gradient, zonal and isopycinic centrifuge. Sedimentation coefficient, factors affecting sedimentation coefficient and application.
2. Radioisotope techniques: half life, radioactive decay, radioactive assay methods based on ionization and excitation of gases.
3. Geiger Muller counter, liquid scintillation counter and gamma counter.
4. Quenching and use of radioisotopes in biological systems. Autoradiography- principles and applications.

M.Sc.II[Ind] Semester
MB: 202 IMMUNOLOGY

UNIT-I

1. Infection: types of infection, sources of infection, reservoirs and vehicles of infection, predisposing factors.
2. History of immunology, development of immunology as disciples.
3. Immune response: mechanism of innate and adaptive immune response.
4. Hematopoiesis: development of immune cells, regulation of hematopoiesis and stem cell technology.

UNIT-II

1. Structure, composition and types of cells involve in immune response: mononuclear cells, granulocytes,antigen presenting cells , lymphoid cells.
2. Anatomical organization of immune system: primary and secondary lymphoid organs: structure and function.
3. Antigens- structure and properties, factors affecting the immunogenicity , properties of B and T-cell epitopes, haptens, mitogens, superantigen.
4. Antibody : stucture, properties, types and function of antibodies, antigenic determinants on immunoglobulin; isotypes, allotypes, and idiotypes.

UNIT-III

1. Hybridoma technology and monoclonal antibody production and characterization.
2. Application of monoclonal antibodies in diagnosis, therapy and basis research, antibody engineering.
3. Antigen- antibody interaction : avidity and affinity measurements, detection of antigen- antibody interaction by precipitation, agglutination, RIA, ELISA, immunodiffusion.
4. Major histocompatibility complex: organization of MHC genes, types and function of MHC molecules, MHC polymorphism, MHC related diseases.

UNIT-IV

1. Complement system: components, activation pathways, regulation of activation pathways, role of complement system in immune response.
2. Cytokines: types, structure and functions, cytokines receptors, cytokine regulation of immune receptors.
3. Immune response to infectious diseases: viral infection, bacterial infection, protozoan diseases, helminthes related diseases.
4. Vaccines: Active and passive immunization, whole organ vaccine, purified macromolecule as a vaccine, DNA vaccine, recombinant vaccine.

UNIT-V

1. Hypersensitivity: type I, II, III and types IV hypersensitivity. Immunodeficiency diseases: primary and secondary immunodeficiency.
2. Autoimmunity: organ specific autoimmune diseases, mechanism of autoimmune diseases and therapeutic approaches.
3. Transplantation immunology: immunologic basis of graft rejection, clinical manifestation of graft rejection and clinical transplantation.
4. Cancer immunology: tumor antigen, immune response to tumor, oncogene and induction, cancer immunotherapy.

M.Sc.II[Ind] Semester
MB: 203 MICROBIAL TECHNOLGOY

UNIT-I

1. Industrial important strains of bacteria, fungi, and actinomycetes .Novel microbes for future industry.
2. Isolation and screening of the industrially important strain from diverse ecosystem.
3. Method of strain improvement, mutagenesis, strain breeding by protoplast fusion, sexual and para sexual recombination.
4. Fermentation technology: principles of fermentation. Fermenter and bioreactors: monitoring and control of parameters, designing, operation and application.

UNIT-II

1. Downstream processing: filtration of fermentation broths recovery of biological products by distillation, superficial fluid extraction.
2. Detection, analysis and quality control of fermentation products and raw materials.
3. Industrial production of alcohols: vinegar, wine and alcohol.
4. Industrial production of solvents-glycerol, acetone, and Butanol.

UNIT-III

1. Industrial production of citric acid and glutamic acid.
2. Microbial production of enzyme of industrial important: amylase and proteases.
3. Methods of whole cell immobilization, enzyme immobilization and application.
4. Industrial production of antibiotics, penicillin and streptomycin.

UNIT-IV

1. Hygiene and safety in fermentation industries.
2. Microbial production of Vitamin B and $B_{12.}$
3. Microbial production of Interferon, Insulin, flavours and fragrances.
4. Bioelectronics : Biochips and biosensors.

UNIT-V

1. Microbial production of vaccines.
2. Microbial production of polymers : Dextran and xanthan.
3. Microbial transformations : Steroid biotransformation
4. Intellectual property rights (IPR) and protection (IPP)

M.Sc.II[Ind] Semester

MB: 204 Biostatistics, Computer Fundamentals and Bioinformatics
(Generic Elective)

Unit I

1. Introduction to Biostatistics, Common terms, notions and Applications
2. Statistical population and Sampling Methods
3. Classification and tabulation of Data
4. Diagrammatic and graphical presentation
5. Frequency Distribution, Measures of central value
6. Measures of variability; Standard deviation, standard Error, Range, Mean Deviation, Coefficient of variation, Analysis of variance

Unit II

1. Basic tests, Test of significance; t-test, chi-square test.
2. Regression; Basic of regression, regression analysis, Estimation, Testing, prediction, checking and residual analysis.
3. Multivariate Analysis.
4. Design of Experiments, randomization, replication, local control, complimentary Randomized, randomized block design

Unit III

1. Factor Analysis.
2. Path analysis
3. Introduction to data mining
4. Virtuous Cycle.

Unit IV

1. Classification and Discriminant Analysis Tools: CART, Random forests,
2. Fisher's discriminant functions.
3. Neural networks.
4. Multilayer perception, predictive ANN model building using back propagation algorithm, exploratory data analysis.

Unit V

1. Introduction to computer basics, concept of hardware windows XP and LINUX
2. Concept of file, folders, directories and their management by windows XP and LINUX
3. Office applications : MS- Office, MS- Word, MS- Excel and MS- PowerPoint
4. Open Office on Linux: Word Processor, spread sheets, Impress
5. Statistical Packages: Sigma plot etc.
6. Introduction to bioinformatics
7. Internet- introduction and application
8. Statistical analysis software

M.Sc.IIIrd Semester
MB : 301 MEDICAL MICROBIOLOGY

UNIT-I

1. Early discovery of pathogenic microorganisms, development of bacteriology as scientific discipline, contribution made by eminent scientists.
2. Host-parasite relationship governing the infection and establishment of disease, factors affecting virulence.
3. Normal microflora of human body; normal flora of skin, respiratory, gastrointestinal, genital tract, role of resident flora
4. Mode of spread of infection; Respiratory, skin, wound & burn infection, venereal infections, alimentary tract infection, blood born infection.

UNIT-II

1. Source of infection, Pathogenicity, Epidemiology & Lab diagnosis of Pneumococcus, Neisseria ,Corynebacterium, & Clostridium.
2. Source of infection, Pathogenicity, & Epidemiology & Lab diagnosis of members of the family Enterobacteriaceae, Coliform; Proteus, Shigella, Salmonella .
3. Vibrio, Mycobacterium, Staphylococcus, Pseudomonas, Pasteurella, Yersenia, Brucella.
4. Actinomycetes, Rickettsiaceae , Clamydiae, Spirocheates.

UNIT-III

Morphology , pathogenesis, immune response, diagnosis and prevention of

1. Pox viruses , Herpes Simplex type I and type II, Picorna viruses.
2. Paramyxo viruses, Measles & Mumps viruses & Rhabdo viruses.
3. Hepatitis viruses, Arboviruses, Orthomyxoviruses.
4. Oncogenic viruses & HIV viruse & Prions.

UNIT-IV

Pathogenesis, Life Cycles, Immunity, Disease produced, Diagnosis & Prophylaxis of

1. Plasmodium vivax, falciparum, malariae.
2. Entamoeba histolytica & Coli
3. Toxoplasmosis , Trypanosomiasis & Leishmaniasis.
4. Roundworm & Tapeworm; Taenia solium & segineta.

UNIT-V

1. Fungal infection: description & classification of pathogenic fungi
2. Infection caused by dermatophytes (Microsporum, Trichophyton & Epidermatophyton)
3. Definition, Causative agent, Source of infection, Epidemiology, Symptomatology & Diagnosis of Aspergillosis & Candidiasis
4. Source of infection, Epidemiology, Symptomatology, & Diagnosis of Blastomycosis, Histoplasmosis

M.Sc.IIIrd Semester

MB: 302 RECOMBINANT DNA TECHNOLOGIES

UNIT-I

1. Enzymes used in DNA technology: Restriction and modification enzymes, nucleases, polymerases, ligase, kinases and phosphatases .
2. Cloning vectors: Plasmids , Phagmids, Cosmids, Artificial chromosomes, Shuttle vectors , Expression vectors
3. Cloning Techniques: Isolation & purification of genomic & plasmid DNA & RNA ,Gel electrophoresis of nucleic acids (RNA & DNA); Pulse field gel electrophoresis.
4. Construction of genomic and cDNA libraries.

UNIT-II

1. Screening of clones from libraries :Expression based screening , Interaction based screening ,Preparation of probes , Restriction mapping.
2. Principles of hybridizations and hybridization based techniques: Colony, plaque, Southern, Northern and in situ hybridizations.
3. Western and southwestern blotting ,Microarray based detections and RNA interferon.
4. Characterization of clones : DNA sequencing , S1 nuclease and RNase mapping.

UNIT-III

1. Oligonucleotide synthesis.
2. Principles & applications of Polymerase Chain Reaction (Types).
3. DNA fingerprinting.
4. Mutagenesis : Site directed mutagenesis, Transposon mutagenesis.

Unit IV

1. Gene transfer techniques: Electroporation and microinjection, Transfection of cells: Principles and methods.
2. Germ line transformation in Drosophila and transgenic mice: Strategies and methods.
3. Construction of knockout mutants.
4. Promoter characterization: promoter analysis through reporter genes, electrophoretic mobility, shift assay, DNA foot-printing.

UNIT-V

1. Applications of Recombinant DNA Technology : Monitoring of gene expression in live cells, Crop and livestock improvement .
2. Molecular diagnostics, Biosafety & ethical considerations.
3. Gene therapy: somatic and germ line gene therapy; DNA drugs and vaccines.
4. Transgenic technologies and there use in microbial technology.

M.Sc.IIIrd Semester

MB: 304 M ICROBIAL PHYSIOLOGY AND METABOLISM

(Generic elective)

UNIT-I

1. Basic concept of bioenergetics and metabolism.
2. First and second law of thermodynamics, concept of free energy, entropy and enthalpy.
3. High energy phosphate compounds, role of ATP, ATP cycle, structural basis of free energy change during hydrolysis of ATP.
4. Biological oxidation and reduction reaction, role of reducing power.

UNIT-II

1. Carbohydrate metabolism: glycolysis and its regulation, Feeder pathway of glycolysis and carbohydrate –homo and heterolactic fermentation. Glycogenesis, Glycogenolysis. Gluconeogenesis ; pathways and regulation.
2. Pentose phosphate pathway, kreb's cycle and glyoxalate pathway.
3. Substrate level phosphorylation and oxidative phosphorylation, electron transfer reaction in mitochondria,electron carriers and multienzyme complex I to IV.
4. ATP synthesis: chemiosmotic theory, shuttle system, regulation of oxidative phosphorylation and uncouplers, inhibitors of oxidative phosphorylation.

UNIT-III

1. Photosynthesis: structure of chloroplast, light reaction and dark reaction; Kelvin cycle, C3 and C4 pathway.
2. Mechanism of energy generation in cyanobacteria, green bacteria and purple sulphur bacteria and chemolithotrops.
3. Lipid metabolism digestion absorption; oxidation of unsaturated fatty acid and odd chain fatty acid, ketone bodies.
4. Lipid biosynthesis: biosynthesis of fatty acids, triacylglycerol and phospholipids and regulation of fatty acid metabolism.

UNIT-IV

1. Amino acid metabolism: biosynthetic families of amino acids.
2. Breakdown of amino acids into six common intermediates and urea cycle and regulation of amino acid metabolism.
3. Nucleotide metabolism; biosynthesis of purines and pyrimidines nucleotide by de novo and salvage pathways.
4. Degradation of purines and pyrimidines nucleotides.

UNIT-V

1. Nitrification, denitrification and pathways of nitrate and ammonia assimilation. Nitrogen cycle.
2. Assimilation of nitrogen: denitrogen fixation- free living and symbiotic, diazotrophic organisms.
3. Biochemistry of nitrogen fixation: nitrogenase complex, function of nitrogenase, regulation of nitrogenaseby oxygen and combined nitrogen sources.
4. Genetics of nitrogen fixation; nif genes and their regulation.

M.Sc.IIIrd Semester

MB: 303 (A) ENVIRONMENTAL MICROBIOLOGY.

(Discipline Centric Elective)

UNIT-I

1. Microbial ecology: basic concepts, types and microbial habitats, factors affecting microbial population.

2. Microbial interactions: competition, amensalism, parasitism, mutualism, commensalisms, synergism.

3. Biogeochemical cycles: carbon, nitrogen, phosphorus and sulphur cycle.

4. Conservation and management of microbial diversity: biodeterioration and biodegradation.

UNIT-II

1. Microbiology of air: microorganism of air, enumeration of air micro flora.
2. Significance of air micro flora.
3. Brief account of air borne transmission of bacteria, fungi , pollens and viruses.
4. Air borne diseases and their prevention.

UNIT-III

1. Soil microbiology: microflora of soil: soil microorganisms associated with plants: rhizosphere, mycorrhizae.
2. Role of microorganisms in organic matter decomposition (cellulose, hemi cellulose, lignin).
3. Bioleaching; introduction, application of bacterial leaching leaching techniques, properties of bioleaching.
4. Microbial degradation of xenobiotics , petroleum and oil spilles in environmental decay behaviours and degradative plasmid.

UNIT-IV

1. Water microbiology: aquatic microorganisms; fresh water and sea water microflora. Microorganisms and water quality, water pollution.
2. Water purity test and indicator organisms, method used in environmental studies –BOD, COD, DO.
3. Common water born disease and their control measure.
4. Water purification: flocculation, chlorination and purification.

UNIT-V

1. Microbiology of waste water and effluent treatments, aerobic process : primary , secondary and tertiary treatment : trickle filter ,oxidation ponds and stabilization ponds , principle of aerobic digestion.
2. Bioremediation of contaminations.
3. Extremophiles –acidophilic, alkalophilic, thermophilic microbes with adaptation and application in ecosystem.
4. Microbial biofilms : physiology ,morphology, biochemisty of microbial biofilms, mechanism of microbial Adherence , beneficial and harmful role of biofilms.

M.Sc. IIIrd Semester

MB 303: (B) MICROBIAL DIAGNOSIS IN HEALTH CLINICS

(Discipline Centric Elective)

UNIT-1

Importance of Diagnosis of Diseases

Bacterial, Viral, Fungal and Protozoan Diseases of various human body systems.
Disease associated clinical samples for diagnosis.

UNIT-2

Collection of Clinical Samples

How to collect clinical samples(oral cavity,throat,skin,blood,CSF,urine and faeces) and precautions required. Method of transport of clinical samples to laboratory and storage.

UNIT-3

Direct Microscopic Examination and Culture

Examination of sample by staining-Gram's stain, AFB stain, Giemsa stained thin blood film for Malaria. Preparation and use of Culture media- Blood agar, Chocolate agar, Lowenstein-Jensen medium, MacConkey agar, Cooked meat media for anaerobic culture. Distinct colony properties of various bacterial pathogens.

UNIT-4

Serological and Molecular Methods

Serological Methods- Agglutination, ELISA, Immuno fluorescence
Nucleic acid based methods-PCR, Nucleic acid probes, Western blotting

UNIT-5

Kits for Rapid detection of Pathogens

Typhoid, Dengue, Malaria and Blood groups.
Importance, Determination of resistance/sensitivity of bacteria using Disc diffusion method.
Determination of Minimal Inhibitory Concentration(MIC)of an antibiotic by serial double dilution method.

M.Sc.IV Semester

MB: 401 AGRICULTURAL MICROBIOLOGY

UNIT I

1. Microorganisms of soil
2. Rhizosphere and phyllosphere microflora
3. Brief account of Microbial interactions: antagonism, symbiosis, mutualism, commensalisms, synergism and parasitism.
4. Nutrient cycle : Carbon cycle , nitrogen cycle, phosphorous cycle and sulphur cycle.

UNIT II

1. Role of enzymes and toxins in pathogenesis.
2. Fungal diseases of plants: Rusts of wheat, linseeds; late blight of potato; red rot of sugarcane.
3. Bacterial diseases of plats : Citrus canker, blight of rice
4. Viral diseases of plants : Leaf curl of Papaya, vein clearing of lady's finger

UNIT III

1. Physical and chemical control of plant diseases.
2. Bacterial control of insect pests : Bacillus thuringiensis as bacterial insecticide
3. Viral control of insect pests : Nuclear polyhedrosis visuses (NPV) and cytoplasmic polyhedrosis viruses (CPV)
4. Fungal control of insect pests : Entomopathogenic fungi : Metarhinium anisopliae, Beauveria bassiana, Verticillium lecani, Hirsutella thompsoni

UNIT IV

1. Storage fungi : Categories of storage fungi, conditions during storage in relation to damage of seeds, harmful effects
2. Mycotoxins and their effect on human being.
3. General idea about quarantine
4. Production of biogas and alcohol from agricultural wastes

UNIT V

1. Biofertilizers : Types, production and application
2. Mycorryzae : Types and their application in agriculture and forestry.
3. Vermicomposting
4. Reclamation of waste agricultural land by microorganisms.

M.Sc.: IV Semester
MB: 402: FOOD MICROBIOLOGY
(Discipline Centric Elective)

UNIT I

1. Microorganisms important in food microbiology: molds, yeast and bacteria –general characteristics, classification and importance.
2. Principles of food preservation, preservation by use of high temperature, low temperature, drying and dessication.
3. Chemical preservatives and additives.
4. Preservation by radiation.

UNIT II

1. Factors influencing microbial growth in food: Extrinsic and intrinsic factors.
2. Microbial spoilage of food. Chemical changes caused by the microorganisms during spoilage.
3. Spoilage of fish, meat, poultry, eggs, fruits and vegetables.
4. Detection of spoilage and characterization.

UNIT III

1. Classification of food borne diseases.
2. Food borne infections : Brucella, Bacilllus, Clostridium perfringens, vibrio, yersinia Escherichia, Salmonella, Shigella.
3. Food intoxication: Staphylococcal intoxication, Clostridial poisoning.
4. Food adulteration and prevailing food standards in India .

UNIT IV

1. Microbiology of Milk : Sources of microorganisms in milk and types of microorganisms in milk.
2. Microbiological examination of milk (standard plate count, direct microscopic count, reductase, and phosphatase test).
3. Dehydration and pasteurization of milk.
4. Dairy products from microorganisms : Butter , yoghurt and cheese .

UNIT V

1. Microorganisms as source of food : Single Cell Protein (SCP)
2. Mushrooms and food value of mushrooms
3. Food conversions : Lactic acid conversions, soyabean conversions and Bakery
4. Microbiological estimation of food : Sample collection,

M.Sc. IV Semester

MB: 402 (B) Enzyme Technologies

(Discipline Centric Elective)

UNIT-1

Introduction to enzymes -Enzyme classification and nomenclature, Characteristics of enzymes production . Mode of action and kinetics of enzyme catalyzed reactions (K_{min} V_{max}) .Types of mechanism of enzyme inhibition ,Biotechnological importance of enzymes.

UNIT-2

Microbial sources of enzymes- Primary and Secondary screening of Microorganisms for enzyme production .Qualitative and Quantitative assay of enzyme activity. Enzymes units Amylases , Cellulases , Hemicellulases ,Proteases . Natural and Synthetic substrates for enzyme assay .

UNIT-3

Microbial enzyme production ; submerged and solid state fermentation (SSF). Important parameters in enzyme production . Enzyme purification Techniques – Precipitation chromatographic separation –gel filtration ,anion and cation exchange ,zymography.

UNIT-4

Techniques used in characterization of enzymes- determination of molecular weight (SDS PAGE ,Gel filtration) . Isolelectric point,pH & temperature optima and stability . Inhibition pattern , Product analysis of enzyme action using TLC HPLC and MALDI – TOF

UNIT -5

Molecular Biology of enzymes- aminoacid sequencing ,structure and function relationship. Protein engineering and directed evolution . Cloning and over expression of microbial enzymes in heterologous host.

SYLLABUS

M. Sc. Environmental Biology (Choice Based Credit System)

Schemes of Examination (Session- 2020-21)

Semester-I

S.No.	Course Name & Code	Course Type	Theory	Internal Assessment	Total Marks	Credit
1.	Ecological Principles	Core	80	20	100	4
2.	*Basic Methods in Ecology	Generic Elective	80	20	100	4
3.	Populations and Biotic Community	Core	80	20	100	4
4.	Earth Environment and Climatology		80	20	100	4
5.	Practical	-	-	-	100	4
6.	Comprehensive Viva Voce	-	-	-	50	2
Semester Total					**550**	**22**

Semester-II

S.No.	Course Name & Code	Course Type	Theory	Internal Assessment	Total Marks	Credit
1.	Biodiversity Conservation	Core	80	20	100	4
2.	Ecological Statistics	Core	80	20	100	4
3.	Environmental Pollution	Core	80	20	100	4
4.	*Global Environmental Issues	Generic Elective	80	20	100	4
5.	Practical	-	-	-	100	4
6.	Comprehensive Viva Voce	-	-	-	50	2
Semester Total					**550**	**22**

Semester-III

S.No	Course Name & Code	Course Type	Theory	Internal Assessment	Total Marks	Credit
1.	Environmental Microbiology	Core	80	20	100	4
2.	Conservative & Management of Natural Resources	Core	80	20	100	4
3.	**(A). Pollution Control and Waste Management	Discipline Centric Elective	80	20	100	4
	**(B). Air Pollution Management	Discipline Centric Elective				
4.	*Environmental Law's and Policies	Generic Elective	80	20	100	4
5.	Practical	-	-	-	100	4
6.	Comprehensive Viva Voce	-	-	-	50	2
Semester Total					**550**	**22**

Semester-IV

S.No	Course Name & Code	Course Type	Theory	Internal Assessment	Total Marks	Credit
1.	Ecotoxicology	Core	80	20	100	4
2.	Environmental Biotechnology	Core	80	20	100	4
3.	**(A). Forest Ecology	Discipline Centric Elective	80	20	100	4
	**(B). Water Pollution Management	Discipline Centric Elective				
4.	Environmental Impact Assessment	Generic Elective	80	20	100	4
5.	Practical	-	-	-	100	4
6.	Comprehensive Viva Voce	-	-	-	50	2
Semester Total					**550**	**22**
Grand Total					**2200**	**88**

* Students may choose this course as a Generic Elective or may choose a Generic Elective offered by other UTDs or may choose a course offered by MOOCs through SWAYAM.

** The department offers Two- Discipline Centric Elective Courses in III and IV semester with internal choices as A or B. Students of this program will have a choice to select one course from the available internal choice in each Discipline Centric Elective course in III and IV semester.

Generic Elective Courses of this program are also available to students of other discipline/ programs of the University Teaching Departments.

M.Sc. ENVIRONMENTAL BIOLOGY
SEMESTER- I
PAPER- I (Core course)
ECOLOGICAL PRINCIPLES

Preamble: This course aims to introduce the basics of ecological principles, ecosystem's structure and functions, and the ecosystem's services provided to society.

1. Ecosystem: Concept, trophic structure, structure and functions, food chains, food webs, ecological pyramids.

2. Energy flow through food chains, productivity; primary productivity of different ecosystems, secondary productivity.

3. Biogeochemical cycling: Concept, gaseous and sedimentary cycles, recycles pathways, Ecological factors; Leibigs and shelford laws of limiting factors.

4. Ecological characteristics of forest ecosystems, grassland ecosystems, desert ecosystems, aquatic ecosystems, urban ecosystems, agricultural ecosystems, natural and managed ecosystems.

5. Ecosystems services to the Society: maintenance of gaseous composition of the atmosphere, climate control by forests and ocean systems, natural pest control, pollination of plants by insect, birds and mammals, formation and protection of soil, conservation and purification of water.

M.Sc. ENVIRONMENTAL BIOLOGY

SEMESTER- I
PAPER- II (Core Course)
BASIC METHODS IN ECOLOGY

Preamble: This paper deals with various methods of sampling of plants, animals, air, water, and analysis of ecological materials.

1. Terrestrial vegetation sampling techniques: Sampling of plants, determination of minimum size and minimum number of quadrates, community analysis; density, frequency, abundance, Importance Value Index (IVI), indices of species diversity, richness, and similarity index.

2. Aquatic sampling techniques: Sampling of macrophytes, phytoplanktons and zooplanktons and aquatic insects. Animal Sampling: Sampling techniques of animal population

3. Estimation of productivity: Primary productivity (chlorophyll estimation, biomass, light and dark bottle methods) and secondary productivity.

4. Analytical methods: Air pollution monitoring techniques, Gaseous and particulate matters sampling, Air samplers, water sampling techniques, water quality analysis (DO, BOD, COD, Hardness).

5. Microbial Techniques: Microbial culture sterilization techniques, culture media preparation, colony counting techniques, determination of MPN.

M.Sc. ENVIRONMENTAL BIOLOGY
SEMESTER- I
PAPER- III (Core Course)
POPULATIONS AND BIOTIC COMMUNITY

Preamble: This course introduces major themes and ecological processes of biotic communities.

1. Concept of Population: Population attributes, population growth; population fluctuation, 'r' and 'k' selection, concept of density dependent and density independent action of population regulation, Ecade and Ecotypes.

2. Concept of Biotic Community: Attributes, structure and composition, stratification, Ecotone and Edge effect, keystone species induced community changes.

3. Interspecific Interactions : Positive and negative interspecific interactions (commensalism, mutualism, predation, competition, parasitism, antibiosis), co-evolution, cooperation and complexity, allelopathy.

4. Ecological Succession : Stages and mechanism of succession, Trends and stages of community development, concept of climax, climax theories.

5. Concept of Habitat and Ecological Niche, niche types, niche width and overlap, ecological equivalent, competition and niche, niche segregation.

M.Sc. ENVIRONMENTAL BIOLOGY
SEMESTER- I
PAPER- IV (Generic Elective Course)
EARTH ENVIRONMENT AND CLIMATOLOGY

Preamble: This course deals with dimensions of earth, atmosphere, soil, climate and major catastrophic climatic conditions confronting our present day from scientific perspective.

1. Lithosphere: Earth structure, Rocks- Sedimentary, Igneous and metamorphic rocks, weathering of rocks.

2. Soil : Soil characteristics (mineral matter, organic matters, soil air and water),soil classification, soil distribution in India, Climate and soil profile, soil formation soil forming processes, factors affecting soil formation, ecological characteristics of soils of different ecosystems.

3. Hydrosphere: Global water balance, ice sheets and fluctuation of sea levels, factors influencing the surface water, freshwater shortage and associated problems, hydrological cycle.

4. Atmosphere : Compositions and divisions of atmosphere, atmospheric pressure, atmospheric winds, clouds and precipitation, atmospheric humidity, temperature and light, Carioles' effects, Solar radiation, Solar pond.

5. Climate : Weather and climate, air circulation and climate, ocean current and climate, Seasonal winds and monsoon, climate of India; Indian monsoon, EL Nino, Tropical cyclones, Western disturbance, Weather modification.

M.Sc. ENVIRONMENTAL BIOLOGY

SEMESTER- II
PAPER- I (Core Course)
BIODIVERSITY CONSERVATON

Preamble: This course introduces the biodiversity at different levels of biological organization and the essential ecological and biological processes to ensure long term stability of ecosystems, and also scientific approaches of conservation of biodiversity.

1. Introduction to biodiversity: The global perspective, biogeographically regions of India, values of biodiversity, biodiversity as a sources of food and improved variety, sources of drugs and medicines, aesthetic and cultural benefits.

2. Levels of biodiversity: Community diversity (alpha, beta, and gamma diversity, genetic diversity, pattern diversity), Gradients of biodiversity (altitudinal, insular), Ecosystems diversity (biomes, mangroves, coral reefs, wetlands, and terrestrial diversity), factors related to tropical and temperate species diversity.

3. Regions of Biodiversity: Mega diversity regions of India, Hot spots of biodiversity, diversity trends of different ecosystems, diversity and distribution of wild life in India, habitat specific endemic plants and animals of India.

4. Threats to biodiversity: Human interventions and biodiversity loss, global environmental changes and biodiversity, introduction of exotic species and biodiversity, natural calamities and biodiversity, extinction of species, threatened plants and animals of India.

5. Conservation of biodiversity: Importance of biodiversity conservation, methods of biodiversity conservation; in-situ and ex-situ modes of biodiversity conservation, In-vitro conservation; germplasm and gene bank, pollen and spore bank, DNA bank.

M.Sc. ENVIRONMENTAL BIOLOGY

SEMESTER- II

PAPER- II (Core Course)

ECOLOGICAL STATISTICS

Preamble: Environmental studies require statistical approach for data analysis. This paper introduces the students about various statistical methods used in the collection of ecological data and analysis for environmental studies.

1. Collection and Representation of Data: Collection of Data; Classification of Data; Tabulation of Data; Graphical Representation of Data Histogram, Frequency polygon, Frequency curve, Relative frequency map, cumulative frequency curve and dot (Scatter) diagram. Diagrammatic Representation of Data-Line diagram, Bar diagrams and Pie diagrams.

2. Measuring of Central Tendency: Mean, Median, Mode.

3. Measuring dispersion: Range, Standard Deviation, Mean deviation, Coefficient of variation, Normal Distribution; Measuring Standard deviation for grouped Data.

4. Standard Error, Standard Deviation, confidence limits, Correlation, Coefficient of Correlation.

5. Null hypothesis, Gaia Hypothesis, Test of Significance: Student's' t ' test, Chi-square test and F-test, Analysis of variance.

M.Sc. ENVIRONMENTAL BIOLOGY
SEMESTER- II
PAPER- III (Core Course)
ENVIRONMENTAL POLLUTION

Preamble: The course deals with air, water, and soil pollution, solid wastes disposal techniques, pesticide pollution, and their impacts on environment, ecosystems and human health and other living organisms.

1. Environmental pollution and pollutants: Concept, definition and characteristics.

2 Air pollution : Natural and anthropogenic sources and types of air pollutants, photochemical reactions, acid rains, PAN, concept of Fog and Smog, effect of air pollution on human beings, plants and animals. Air quality standards, vehicular pollution.

3. Water pollution : Sources and types of water pollutants, Effect of water pollutants on living organisms, water pollution linked human diseases, ground water pollution, heavy metals and their effects on biota, thermal pollution, characteristics of industrial effluents.

4. Solid wastes: Source and generation of solid wastes; composition , classification and disposal techniques of solid wastes, municipal and industrial wastes, biomedical wastes, Electronic wastes, and their environmental effects.

5. Pesticides: Classification, properties, effects on living organisms.

M.Sc. ENVIRONMENTAL BIOLOGY
SEMESTER- II
PAPER- IV (Generic Elective Course)
GLOBAL ENVIRONMENTAL ISSUES

Preamble: This paper introduces various global as well as national environmental issues and problems, and their dimensions, causes and effects.

1. Current environmental issues in India: Air pollution in Indian cities, soil quality deterioration in Indian crop fields, pollution in major rivers of India, Namami Gange project, surface water crisis in India, forest fire, Threats to Indian forests by exotic plant species.

2. Global environmental problems: Ozone depletion, Deforestation, Green house gases and their increasing trends. Global warming, Global warming and climate change, recent records of climate change, Extreme weather events, Impact of climate change on ecological systems, Measures to cope with climate change.

3. Environmental Hazards: Geological hazards - volcanoes, Earthquakes, Tsunami, Hydrological hazards -Floods, Droughts, Hurricanes, Cyclones.

4. Disaster and Hazard management : Human and ecological impacts, risk assessment and vulnerability, analysis, National preparedness and adaptation strategies, Hazards policies and agencies, Role of GIS and remote sensing in surveillance, monitoring, risk assessment.

5. Recent international conventions on environmental problems.

M.Sc. ENVIRONMENTAL BIOLOGY
SEMESTER- III
PAPER- I (Core Course)
ENVIRONMENTAL MICROBIOLOGY

Preamble: The course is aimed at providing comprehensive information on microbial habitats and applicability of microbes in various fields of ecosystems and human well beings.

1. Introduction to Microbiology: Characterization and Classification of Micro-organisms, environmental factors affecting microbial growth and microbial adaptations to extreme environments (like arctic and hot springs).

2. Soil Microbiology: Microbes in soil, role of microbes in nitrogen fixation, Microbes of waste water treatment and solid waste management, microbial biogeochemical process of nutrient cycling and biodegradation.

3. Food Microbiology: Microbial flora of foods, Microbial Spoilage and examination, preservation of foods, Fermented foods, Microorganisms as food (SCP), Micro-organism in Milk and Milk products, Pasteurization of Milk, examination of milk micro-organisms

4. Industrial Microbiology : Industrial use of Bacteria - Lactic Acid Production, Vinegar Production, Biogas Production, Industrial use of Molds - Penicillin Production, Industrial use of Yeast - Alcohol Production; Vaccine Production

5. Microbial habitats (air, freshwater, marine and deep sea), natural microbial communities with emphasis on biofilms, plants and animals as microbial habitats and human microbiohome.

M.Sc. ENVIRONMENTAL BIOLOGY
SEMESTER- III
PAPER- II (Core Course)
CONSERVATION AND MANAGEMENT OF NATURAL RESOURCES

Preamble: This course deals with dimension and issues of natural resources and environment. It also aims to provide adequate insight on management and conservation of natural resources.

1. Resources: Renewable and non-renewable energy resources, major resources - Surface/subsurface water in India, forest, wildlife. Bio-energy (biomass, biogas), clean energy.

2. Identification and description of various threats to different ecosystems with particular reference to Fresh water, Forest, Grassland, Estuary, and Wetlands.

3. Principles of environmental conservation and management, ecological accounting. Sustainable development: environment and development, concept of sustainability, dimension of sustainable development, framework for achieving sustainability and assessment of sustainable development.

4. Conservation and management of natural resources - Wild life; In-situ (national parks, sanctuaries) and Ex-situ conservation, energy conservation, biodiversity conservation (Biospheres Reserves), biological control and integrated pest management, aquaculture, rainwater harvesting, wild life habitat conservation.

5. Environmental Administration: Role of government and non-government organizations, environmental education and awareness.

M.Sc. ENVIRONMENTAL BIOLOGY
SEMESTER- III
PAPER- III (Discipline Centric Elective Course - A)
POLLUTION CONTROL AND WASTE MANAGEMENT

Preamble: This course aims to provide the students an orientation to technologies that are applied to monitor and mitigate environmental pollution and solid waste.

1. Air Pollution management and control technology: Air pollution sampling and measurement, air pollution control methods, control of particulates and gaseous air pollutants, disaster management.

2. Water pollution management and control technology: Waste water sampling and analysis, waste water treatment, primary, secondary and advanced waste water treatment.

3. Marine pollution management and control technology: Sampling and measurement of marine pollution control of marine pollution, technologies to minimize and combat climate change, carbon credits and carbon trading, carbon sequestration, conventions of climate change

.

4. Solid Waste Management: Municipal waste management, Hazardous waste management, recycling, characterization of hospital wastes and their management, Methane production, landfill, microbes and soil waste management, concept of 5 'R'.

5. Concept and types of bioremediation, Bio-augmentation, bioremediation of sludge, biodegradation of toxic substances by microbes, Phytoremediation of air and water pollution, Phytoextraction and Biofilteration techniques for- waste management.

M.Sc. ENVIRONMENTAL BIOLOGY
SEMESTER- III
PAPER- III (Discipline Centric Elective - B)
AIR POLLUTION MANAGEMENT

Preamble: This course aims to introduce the students about techniques of sampling and analysis of air pollutants, and management and control of air pollution.

1. Sources of air pollution, principles of air pollution management, effect of meteorological parameters on transport and diffusion of air pollutants, wind roses, and ambient concentrations of air pollutants.

2. Strategies of sampling and analysis of air pollutants; sampling of particulate matters (TSPM, PM10, and PM2.5) and gaseous pollutants, ambient air quality monitoring, stack monitoring, bio-monitoring, indices in air quality monitoring.

3. Measurement of air pollutants; dust fall measurement, measurement of particulate matters, SO_2, NOx, oxidants, ozone, carbon monoxide, hydrocarbons and smoke density.

4. Air pollution control; control at source, control of particulate matters (Settling chambers, Cyclones, Settling towers, Scrubbers, Electrostatic precipitator), control of gaseous air pollutants (Absorption, Adsorption, Combustion, Collection and Recovery system), control of vehicular emission (catalytic recovery devices).

5. Air quality management; identification of specific problems, source-emission inventory, air quality criteria, air quality standards, legislation in India, environmental criteria for sitting industries and green belts.

M.Sc. ENVIRONMENTAL BIOLOGY
SEMESTER- III
PAPER- IV (Generic Elective Course)
ENVIRONMENTAL LAWS AND POLICIES

Preamble: The aim of this course is to introduce the students about various laws to protect the environment from damage and also to explain the legal consequences of such damages.

1. Environmental protection issues and problems. international and national efforts of environmental protection, environment and constitution.
2. Environmental policy resolutions and legislation, The water (Prevention and Control of Pollution) Act 1974 as amended up to 1988 and Rules 1975, The Air (Prevention and Control of Pollution) Act 1981 as amended by 1987 and rules 1982, Motor Vehicle Act 1988.
3. The Environmental Protection Act 1986 and Rules 1986, Hazardous waste management and handling rules 1989 amendments thereof 2000, Disaster Management Act 2005.
4. Hospital waste management and Handling rules 1998, Solid Waste Management Rules 1999, Public Liability Insurance Act 1991 and Rules 1991, Electronic Waste Management Rules 2016.
5. Wildlife Protection Act 1972, Amended 1991, Forest Conservation Act 1980, Indian forest Act (revised) 1982, Biodiversity Rules 2004.

M.Sc. ENVIRONMENTAL BIOLOGY
SEMESTER- IV
PAPER- I (Core Course)
ECOTOXICOLOGY

Preamble: The course introduces the students on natural and anthropogenic toxic chemicals, their transport and toxicity to the constituents of ecosystems, and their fate in ecosystems.

1. Principles and mechanisms of toxicity, Basic problems of toxicology, factors affecting concentration of Toxicants in environment, Toxicity test, Dose-effect and dose response.

2. General aspects of fate and effects: Media and compartments, entry pathways, environmental fate, sinks, surface water compartment, soil compartment, bioavailability, effects, uptake, types of effects; Acute and chronic.

3. Cellular response profile to chemical stress: Interaction with membrane process, Intracellular fate of chemicals, Intracellular receptors, reaction with nuclear structures and functions, protective molecules and processes, Cell injury and death.

4. Fate of pollutants in Ecosystems : Biotransformation, bioaccumulation, biomagnifications, ecotoxicology of pesticides and herbicides, toxicity of hydrocarbons, target and non-target organ toxicity, hepatotoxicity, neptrotoxicity, neurotoxicity, respirotoxicity.

5. Toxicity of heavy metals : Pb, Hg, Cd, AS, CO and Ni, carcinogens and carcinogenesis and mutagens, Immunotoxic agents.

M.Sc. ENVIRONMENTAL BIOLOGY
SEMESTER- IV
PAPER- II (Core Course)
ENVIRONMENTAL BIOTECHNOLOGY

Preamble: This course is aimed at providing comprehensive knowledge to develop potential solution for remedy of environment using microbes and molecular technologies.

1. Gene morphology and structure, concept of genetic engineering, DNA technology, application of biotechnology in environmental management.
2. Pollution control using engineered microorganisms, Role of microbes in control of air pollutants, Biomass and Biofual, biofilters for air pollution control, Biosensors.
3. Waste water Treatment : Anaerobic and aerobic process, Methanogenesis, bioreactors, cell and protein immobilization techniques, treatement scheme for waste water, dairy, distillary, tannery, sugar and antibiotic industries.
4. Biodegradation of xenobiotics, hydrocarbons, Oil spills, pesticies, varmicullare and vermi-composting, biopesticides, biofertilizers.
5. Plant and animal tissue culture, organ culture, applications of tissue culture, in vitro conservation of germplasm, gene bank, clean gene technology.

M.Sc. ENVIRONMENTAL BIOLOGY
SEMESTER- IV
PAPER- III (Discipline Centric Elective Course - A)
FOREST ECOLOGY

Preamble: This paper introduces the students about different forest types, their distribution, structure, functions and ecological characters.

1. Forest types of India, distribution of Indians forests, factor governing distribution of Indian forests.

2. Forest as an ecosystem: Structural attributes: Dominant plant species of different forests, phytosociological attributes; density and dominance relations of different forest communities, forest stratification and canopy structure, microclimate.
3. Functional Attributes:
   (a) Energy flow: process, importance of food chains, , productivity of different forests.
   (b) Material cycling: Process of nutrient cycling in forests, nutrient cycling in temperate and tropical forests, litter production and decomposition.

4. Forest Ground floor ecology: Ecology of seed placement and germination in forests, seedlings growth, seedling establishment strategies, characteristics of soils of different forests.
5. Ecological characteristics of tropical and temperate forests of India, important wild life of India, man-forest interactions.

M.Sc. ENVIRONMENTAL BIOLOGY
SEMESTER- IV
PAPER- III (Discipline Centric Elective -B)
WATER POLLUTION MANAGEMENT

Preamble: This course introduces the aspects of water pollution of aquatic ecosystems, characteristics of sewage and industrial effluents, various techniques applied for treatment of sewage and effluents, and water management strategies.

1. Classification of water bodies, physico-chemical and biological properties of fresh water, water quality standards, major sources of water pollution, physico-chemical and biological properties of sewage.

2. Quality of industrial effluent produced from textile, leather, dairy, thermal power and chemical industries, changes in water quality due to discharge of city sewage, industrial effluent from textile, leather, dairy, thermal power and chemical industries.

3. Effects of water pollutants on phytoplankton's productivity and other organisms of food chains, bio-indicators of water pollution.

4. Stages of treatment of sewage - primary treatment and secondary treatment (activated sludge, oxidation ponds, and trickling filters), advanced waste water treatment, biological treatment of waste water, treatment of industrial effluent released from textile, dairy, leather, thermal power and chemical industries.

5. Water management strategies, rain water harvesting, recharging of ground water, use of domestic waste water, recycling of ground water, recycling of effluent after treatment.

M.Sc. ENVIRONMENTAL BIOLOGY
SEMESTER- IV
PAPER- IV (Generic Elective Course)
ENVIRONMENTAL IMPACT ASSESSMENT

Preamble: This course aims to give insight on systematic process that examines the environmental consequences of development actions, in advance. This process is firmly on the agenda of all environmental agencies as a result of introduction of legislations in various countries.

1. Nature and purpose of Environmental Impact Assessment, Origin and Development, EIA Development in India, Frame work of EIA, EIA guidelines 1994 and 2006
2. Requirement for Impact Assessment, main steps of Impact Assessment, the pre study, the study period and the post study period activities.
3. Methods of Environmental Impact Assessment (I) Adhoc method, Check lists, Matrix methods, Networks , (II) Evaluation systems, modelling and computer aided assessment
4. Prediction and Assessment of Impacts on air and water environment, energy, noise, socioeconomic and biological components
5. Concept of Environmental Auditing (EA), Environmental Impact Statement (AIS) and Environmental management plan (EMO), Cost - Benefit analysis, case studies with particular reference to mining project, cement industry, and thermal power plant.

MBA Programme

[MASTER OF BUSINESS ADMINISTRATION]

FULL TIME FOUR SEMESTER PROGRAMME

APPROVED BY AICTE

CHOICE BASED CREDIT SYSTEM (CBCS)

AS PER ORDINANCE 14, APPROVED BY CO-ORDINATION COMMITTEE

PROSPECTUS

PROGRAMME STRUCTURE, SYLLABUS & SCHEME

(SESSION 2020-21 ONWARDS)

DEPARTMENT OF BUSINESS ADMINISTRATION

AWADHESH PRATAP SINGH UNIVERSITY

REWA, MADHYA PRADESH, INDIA

BOARD OF STUDIES

IN

BUSINESS ADMINISTRATION

(2020-21)

AWADHESH PRATAP SINGH UNIVERSITY

REWA, MADHYA PRADESH, INDIA

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Alumni	**Academicians**
Mr. Mahesh Chandra Dwivedi, DGM (Finance), GAIL, Jaipur (Raj) Mr. Sandeep Singh, Arbitrator, Palm Oil Association, Kualalumpur, Malasia Mr. Vinil Pant, Senoir Mgr., Planet EduExams Pvt. Ltd., New Delhi Mr. Abhijit Mishra, Key Accounts Mgr., Adani Wilmar Ltd., Ahemdabad Dr. Pushpendra K. Mishra, Vice President, Axis Bank, Lucknow (UP) Mr. Devendra Singh Chauhan, Deputy VP, Edelweiss Tokyo Life Insurance Company Ltd., Bhopal (MP) Dr. V. D. Tripathi, DGM, IDBI Bank, Satna (MP) Mr. Prashant Chaturvedi, Entrepreneur- Financial Services, Bhopal (MP) Dr. Fahimuddin Siddiqui, Chief Mgr.- Wealth Mgt. IDFC First Bank, Hyderabad Mr. Raghuvendra Mishra, Manager-BCCL Response, Times of India, Mumbai Mr. Abhay Pandey, Channel Partner, Swastika Investmart Ltd., Rewa (MP) Mr. Ashutosh Pandey, Sr. Mgr HR, Tata Cummins Ltd. Jamshedpur (JH)	Dr. Rahil Yusuf Zai, Assistant Professor, IGNTU, Amarkantak Dr. Malini Singh, Associate Professor, Institute of Innovation Technology & Management, New Delhi **Faculty Members** Dr. Deepa Saxena Dr. Amit Shrivastava Dr. Ashish Pandey Dr. Sheshpal Namdeo Dr. Nidhi Shrivastava Dr. Isha Kaur Rakhra Dr. Anand Singh Ms. Shweta Hotwani

Master of Business Administration (MBA)
Full-Time Four Semester Programme

Choice Based Credit System (CBCS)
As Per Ordinance 14, Approved by Co-ordination Committee

Programme Objectives (POs)

The **MBA Programme** Structure is divided into four semesters spread over two years. The courses are classified as Core Courses, Discipline Centric Electives and Generic Elective Courses. The programme structure has been designed systematically and divided into four semesters. **Semester I** has **Core Courses** focusing on Management Concepts, Business Environment, Accounting, Economics and Quantitative Methods being included to develop **multi-disciplinary foundation and** to build a holistic approach among the participants, while core courses of Communication Skills and ICT & E-Business Fundamentals have been offered for **skill development. Semester II** introduces the participants to the different functional areas of management viz. Finance, Human Resource Management, Marketing, Production & Operations Management. One Course each on all the basic functional areas have been designed and placed here to give an insight to the participants on the areas of **specialization** before they choose it in Semester III. A course on Business Legislation is included to acquaint them with laws related to basic business operations. One course on Research Methodology has also been placed here so that the participants could have basic knowledge of research before they go to Corporate World for their Internship during the Summer Break. A **value based course** on Indian Ethos & Ethics Management has been introduced to garnish **sustainability of success** in the long term with the learning's from **Indian values. Dual specialization** in MBA Programme is offered with an aim to develop multi skilled products and their better employability. **Semester III & IV** offers **Discipline Centric Elective Courses** on **Marketing, Finance & HRM** as elective **areas of specialization** along with Core Course on Operations Research, MIS and Strategic Management to develop critical thinking, analytical skills, effective communication and integrative approach among the students. **Generic Elective Courses** on Organisational Behaviour & Industrial Psychology, International Business Environment, Entrepreneurship and Managing Banks & Financial Institutions have been introduced to inspire the students to understand human behaviour at work, global perspectives of business, encourage them to establish their own business & start-ups and **value addition** to tap the employment opportunities in Banking & Finance Sector. Case Studies, Class Presentation, Assignment & Co-curricular activities are integral part of the programme to give **practical exposure** to the participants regarding local, regional, national & global developments in the field of business management. Dissertation and Comprehensive Viva Voce are included in the programme structure to assess students' skills to implement the learned concepts into practice and test their comprehension ability.

Programme Specific Objectives (PSOs)

Following six programme specific objectives have been identified as per AICTE Model Curriculum and will be pursued in order to develop desired knowledge, skills, values and attitudes as learning outcomes among the students attending the MBA Programme:

1. **Business Environment and Domain Knowledge (BEDK)**: Economic, legal and social environment of Indian business. Graduates are able to improve their awareness sand knowledge about functioning of local and global business environment and society. This helps in recognizing the functioning of businesses, identifying potential business opportunities, evolvement of business enterprises and exploring the entrepreneurial opportunities.

2. **Critical thinking, Business Analysis, Problem Solving and Innovative Solutions (CBPI)**: Competencies in quantitative and qualitative techniques. Graduates are expected to develop skills on analysing the business data, application of relevant analysis, and problem solving in other functional areas such as marketing, business strategy and human resources.

3. **Global Exposure and Cross-Cultural Understanding (GECCU)**: Demonstrate a global outlook with the ability to identify aspects of the global business and Cross Cultural Understanding.

4. **Social Responsiveness and Ethics (SRE)**: Developing responsiveness to contextual social issues/ problems and exploring solutions, understanding business ethics and resolving ethical dilemmas. Graduates are expected to identify the contemporary social problems, exploring the opportunities for social entrepreneurship, designing business solutions and demonstrate ethical standards in organizational decision making. Demonstrate awareness of ethical issues and can distinguish ethical and unethical behaviours.

5. **Effective Communication (EC)**: Usage of various forms of business communication, supported by effective use of appropriate technology, logical reasoning, articulation of ideas. Graduates are expected to develop effective oral and written communication especially in business applications, with the use of appropriate technology (business presentations, digital communication, social network platforms and so on).

6. **Leadership and Teamwork (LT)**: Understanding leadership roles at various levels of the organization and leading teams. Graduates are expected to collaborate and lead teams across organizational boundaries and demonstrate leadership qualities, maximize the usage of diverse skills of team members in the related context.

Programme Structure

SEMESTER – I					
Course Code & Name	**Course Type**	**Theory Paper**	**Internal Assessment**	**Maximum Marks**	**Credits**
101 Management Concepts & Practices	CC	60	40	100	4
102 Quantitative Methods	CC	60	40	100	3
103 Managerial Economics	CC	60	40	100	3
104 Business Environment	CC	60	40	100	3
105 Business Communication	CC	60	40	100	3
106 Accounting for Managers	CC	60	40	100	3
107 ICT & E- Business Fundamentals	CC	60	40	100	3
108 Organisational Behaviour & Industrial Psychology*	GE	60	40	100	4
109 Comprehensive Viva Voce	CC			100	4
SEMESTER TOTAL				**900**	**30**

SEMESTER – II					
Course Code & Name	**Course Type**	**Theory Paper**	**Internal Assessment**	**Maximum Marks**	**Credits**
201 Indian Ethos & Ethics Management	CC	60	40	100	4
202 Research Methodology	CC	60	40	100	3
203 Human Resource Management	CC	60	40	100	3
204 Financial Management	CC	60	40	100	3
205 Marketing Management	CC	60	40	100	3
206 Production & Operations Management	CC	60	40	100	3
207 Business Legislation	CC	60	40	100	3
208 International Business Environment*	GE	60	40	100	4
209 Comprehensive Viva Voce	CC			100	4
SEMESTER TOTAL				**900**	**30**

CC: Core Course GE: Generic Elective

*Students may choose this course as a **Generic Elective** or may choose a Generic Elective Course offered in other UTDs at the same level or may choose a Course offered by MOOCs through SWAYAM.

SEMESTER – III					
Course Code & Name	**Course Type**	**Theory Paper**	**Internal Assessment**	**Maximum Marks**	**Credits**
301 Operations Research	CC	60	40	100	4
302 A Consumer Behaviour**	DCE	60	40	100	4
302 B Investment Analysis & Portfolio Management**	DCE	60	40	100	4
302 C Employee Relations**					
303 A Sales & Distribution Management**	DCE	60	40	100	4
303 B International Finance**	DCE	60	40	100	4
303 C Human Resource Development**					
304 Entrepreneurship*	GE	60	40	100	4
305 Internship Dissertation & Comprehensive Viva Voce	CC			100	6
SEMESTER TOTAL				**700**	**30**

CC: Core Course GE: Generic Elective DCE: Discipline Centric Elective

*Students may choose this course as a **Generic Elective** or may choose a Generic Elective Course offered in other UTDs at the same level or may choose a Course offered by MOOCs through SWAYAM.

Students may choose any four courses as **Discipline Centric Electives from the six courses offered in three choice based specialisations: Marketing, Finance and Human Resource Management (Group A&B or A&C or B&C).

SEMESTER – IV					
Course Code & Name	**Course Type**	**Theory Paper**	**Internal Assessment**	**Maximum Marks**	**Credits**
401 Strategic Management	CC	60	40	100	3
402 Management Information System	CC	60	40	100	3
403 A Integrated Marketing Communication**	DCE	60	40	100	4
403 B Project Appraisal & Finance**	DCE	60	40	100	4
403 C Compensation & Benefits Management**					
404 A International Marketing**	DCE	60	40	100	4
404 B Taxation**	DCE	60	40	100	4
404 C Organisational Change & Development**					
405 Managing Banks & Financial Institutions*	GE	60	40	100	4
406 Comprehensive Viva Voce	CC			100	4
SEMESTER TOTAL				**800**	**30**
GRAND TOTAL				**3300**	**120**

CC: Core Course GE: Generic Elective DCE: Discipline Centric Elective

*Students may choose this course as a **Generic Elective** or may choose a Generic Elective Course offered in other UTDs at the same level or may choose a Course offered by MOOCs through SWAYAM.

Students are required to continue with two specialisations: Marketing, Finance and Human Resource Management (Group A&B or A&C or B&C) chosen by them in III Semester and take four courses as **Discipline Centric Electives.

Credit Distribution

SEMESTER	CORE COURSES	ELECTIVE COURSES		COMPREHENSIVE VIVA /DISSERTATION	TOTAL CREDITS
		GENERIC	DISCIPLINE CENTRIC		
Semester I	**22**	**04**	**00**	**04**	**30**
Semester II	**22**	**04**	**00**	**04**	**30**
Semester III	**04**	**04**	**16**	**06**	**30**
Semester IV	**06**	**04**	**16**	**04**	**30**
TOTAL	**54**	**16**	**32**	**18**	**120**

Scheme of Examination

1. Semester End Theory Paper: Each theory paper of 60 marks will have following questions.

Type of Questions	Number of Questions	Marks allotted to each Question	Total Marks
Short Answer Type	5	4	20
Long Answer Type	5	8	40

There will be two questions of each type from each unit of syllabus in all the question papers.

2. Internal Assessment: The internal assessment of 40 marks shall be based on two Written Tests of 20 marks each and one Test of 20 marks based on Assignment, Presentation & Class Participation of the student with following details. Marks will be awarded on the basis of best of the two Test Scores.

Type of Assessment	Marks	Remarks
Class Test	20 Marks	Two assessments of 20 Marks Each on the basis of evaluation of Answer scripts of the student.
Assignment	05 Marks	Assessment based on Written Assignment submitted by the student within due date on the allotted topic.
Presentation	10 Marks	Assessment based on Oral Presentation given by the student within due date on the allotted topic.
Class Participation	05 Marks	Assessment based on attendance and active participation of the student in the class debates, discussions, quiz etc.

The University Teaching Department reserves all rights to make necessary changes in the above Internal Assessment valuation system in case of any contingencies.

Computation of Letter Grade, Grade Points, Credit Points, SGPA & CGPA

1. Grade Letter & Grade Points

The grade letter and grade points will be assigned as per the following table:

Letter Grade	Grade Points	Description	Range of Marks (%)
O	10	Outstanding	90-100
A+	9	Excellent	80-89
A	8	Very good	70-79
B+	7	Good	60-69
B	6	Above Average	50-59
C	5	Average	40-49
P	4	Pass	35-39
F	0	Fail	00-35
Ab	0	Absent	Absent

2. Credit Points

The credit points will be computed by multiplying course credit with grading points in each course. Total Credit Points of the semester will be calculated by adding the credit points of all the courses of the concerned semester.

3. SGPA

Semester Grading Point Average will be calculated by dividing the total credit points of the semester by sum of credits allotted to that semester:-

SGPA (Si) = $\sum$(Cix × Gi)/$\sum$Ci **(**SGPI will be expressed up to two decimal places by rounding off).

4. CGPA

Cumulative Grading Point Average will be calculated by by taking the ratio of total credit points scored by the student and sum of total credits in all courses studied till the semester end. CGPA will be expressed up to two decimal places by rounding off.

An illustration of computing letter grade, grade points, credit points, SGPA & CGPA:

Course Code	Course Title	Credits	Grade	Grade Point	Credit Points (Credits x Grade Point)
101	Management Concepts & Practices	4	B+	7	4×7 = 28
102	Quantitative Methods	3	A	8	3×8 = 24
103	Managerial Economics	3	C	5	3×5 = 15
104	Business Environment	3	B+	7	3×9 = 27
105	Communication Skills	3	B+	7	3×7 = 21
106	Accounting for Managers	3	B	6	3×6 = 18
107	Computers for Management	3	C	5	3×5 = 15
108	Organisational Behaviour & Industrial Psychology*	4	B+	7	4×7 = 28
109	Comprehensive Viva Voce	4	B+	7	4×7 = 28
	TOTAL CREDIT POINTS	30			204
SEMESTER I		SGPA = 204/30 = 6.8			

Course Code	Course Title	Credits	Grade	Grade Point	Credit Points (Credits x Grade Point)
201	Indian Ethos & Ethics Management	4	A	8	4×8 = 32
202	Research Methodology	3	A	8	3×8 = 24
203	Human Resource Management	3	B	7	3×7 = 21
204	Financial Management	3	A+	9	3×9 = 27
205	Marketing Management	3	B+	7	3×7 = 21
206	Production & Operations Management	3	B	6	3×6 = 18
207	Business Legislation	3	B+	7	3×7 = 21
208	International Business Environment*	3	B+	7	3×7 = 21
209	Comprehensive Viva Voce	4	A	8	4×8 = 32
	TOTAL	30			217
SEMESTER II		SGPA = 217/30 = 7.23			

	Semester I	Semester II	Semester III	Semester IV
Credit Points	204	217		
Credits	30	30		
SGPA	6.8	7.23		
CGPA	6.8	7.02		

Conversion of CGPA in to Percentage:

% = CGPA×10%

Ex.

6.8×10% = 68%
7.02×10% = 70.2%

MBA Programme

[MASTER OF BUSINESS ADMINISTRATION]

FULL TIME FOUR SEMESTER PROGRAMME

APPROVED BY AICTE

CHOICE BASED CREDIT SYSTEM (CBCS)

AS PER ORDINANCE 14, APPROVED BY CO-ORDINATION COMMITTEE

SYLLABUS

(SESSION 2020-21 ONWARDS)

DEPARTMENT OF BUSINESS ADMINISTRATION

AWADHESH PRATAP SINGH UNIVERSITY

REWA, MADHYA PRADESH, INDIA

SEMESTER I
CC 101: MANAGEMENT CONCEPTS & PRACTICES

Course Credits: 04 **Max. Marks in Theory Paper: 60**

Objective:
The objective of this course is to familiarise the participants with basic management concepts and behavioural processes in the organisation.

Course Contents:

UNIT I: Introduction
Concept and significance of Management as a science or an art, Distinction between Management and Administration Functional Management, Principles of Management. Evolution of Management Thought: Classical School, Neo-Classical School & Modem School.

UNIT II: Planning and Decision Making

Planning- Nature Process, Types, Principles & Significance. Planning Vs Forecasting. Objectives: Meaning, Characteristics, Types, MBO: Process & Importance. Decision Making: Meaning & Significance, Types, Process, Rationale & Limitations.

UNIT III: Organizing
Organizing- Concept & Process, Organisational Structures & Design, Departmentation- Meaning, Needs and Consideration, Span of Management. Authority, Power and Responsibility. Delegation of Authority- Meaning. Advantages and Limitations, Centralization Decentralization of Authority.

UNIT IV: Direction, Motivation & Leadership
Direction-Meaning, Principles and Techniques. Motivation- Meaning, Significance and Theories. Leadership-Concept & Styles, Qualities of a Good Leader, Leadership Theories, Leadership & Decision Making.

UNIT V: Controlling & Co- ordination
Controlling- Meaning, Characteristics and Steps. Prerequisites of an effective control. Co-ordination-Meaning. Importance and Principles. Co-ordination as an essence of management.

Outcome:
Business Environment and Domain Knowledge
The graduates will be able learn about the basic concepts, principles and process of management. This learning will build a foundation and help them in understanding basic functioning of the organisations not only in corporate but also in other sectors such as government, NGO, Social Organisations etc.

Suggested Readings:

1.	Koontz O Donnell	:	Essentials of Management
2.	Terry and Franklin	:	Principles of Management
3.	Drucker Peter	:	Principles of Management
4.	Prasad, L.M	:	Principles of Management
5.	Narayan & Rao	:	Principles of Management

List of Cases, Recent Articles and Specific References will be announced in the Class Room at the time of launching of the course.

CC 102: QUANTITATIVE METHODS

Course Credits: 03 **Max. Marks in Theory Paper: 60**

Objective:
The objective of the course is to provide elementary knowledge of the concepts of Quantitative Techniques and their application in business decisions.

Course Contents:

UNIT I: Matrices
Elementary Introduction to Vectors & Determinants. Matrices: Meaning, Definition, Kinds, Equality, Transpose and basic operations on Matrices, Business Application of Matrices: Representation of data, Solution to the Simultaneous Equations.

UNIT II: Probability
Introduction, Basic Terminologies, Simple Problems related to Addition, Multiplication and Division of Probability, Conditional Probability.

UNIT III: Introduction to Statistics
Arithmetic Mean, Median, Mode and Weighted Average, Geometric Mean, Range, Quartile, Percentile, Deciles, Mean Deviation, Standard Deviation, and Coefficient of Variation.

UNIT IV: Statistical Analysis (a)
Co-relation and Regression Analysis, Scatter diagram and Karl Pearson's Co-efficient of Correlation. Index number: Quantity and Price Indexes, Fisher's Ideal Index Number.

UNIT V: Statistical Analysis (b)
Time Series Analysis and Forecasting: Components of Time Series, Measurement of Trend & Forecasting: Graphical, Moving Average and Least Square Methods.

Outcome:
Critical thinking, Business Analysis, Problem Solving and Innovative Solutions
The graduates of this course will be able learn about the basic mathematics and statistics applicable in business decisions. This will sharpen their critical thinking, analytical skills and problem solving ability.

Suggested Readings:

1.	Levin Rechard I	:	Statistics for Management
2.	Gupta, C.B.	:	An Introduction to Statistics.
3.	Gupta. S.C	:	Fundamentals of Statistics.
4.	Elhance, D.N	:	Fundamentals of Statistics.
5.	Ray & Sharma	:	Statistics.
6.	Raghavchari, C.	:	Business Mathematics.

CC 103: MANAGERIAL ECONOMICS

Course Credits: 03 **Max. Marks in Theory Paper: 60**

Objective: The objective of this course is to acquaint the participants with concept and techniques used in micro and macro economics and to enable them to apply this knowledge in the business decision making.

Course Contents:

UNIT I: Introduction

Managerial Economics: Meaning, Scope, Relationship with other disciplines. Demand Analysis, Elasticity of Demand. Supply: Nature, Types & Equilibrium. Indifference Curve Analysis, Price, Income and Substitution Effect. Demand Forecasting. Significance of Managerial Economics in Business Decisions.

UNIT II: Production Theory & Cost Analysis

Production Theory: Proportion (Short Run Production Analysis) and Law of returns to scale (Long Run Production Analysis) through the use of ISO QUANTS. Cost analysis: Cost Concept, Cost in Managerial Decision.

UNIT III: Theory of Firm & Market Structure

Theory of Firm- Profit Maximization & Sales Maximisation. Market Structure- Features and Price Determination of Monopoly, Oligopoly, Perfect Competition and Non- Price Competition.

UNIT IV: Employment Theory & Business Cycle

The Classical Theory of Employment, the Keynesian Theory of Employment. Circular Flow of Income in 2,3,4 Sector Economy. Business Cycle: Phases, Significance and Impact on society. Government policies related to Business Cycle, Inflation, Money supply.

UNIT V: Macro Economics Aggregates & Concepts

Concept and Measurement of National Income. Determination of National Income. Consumption & Saving Functions and their relationships. Aggregate Consumption – Gross Domestic Savings, Gross Domestic Capital Formation, GNP & GDP, WPI, CPI, HDI, Inflation. Investment Function: MEC & MEI. Balance of Payment, Fiscal Policy and Monetary Policy.

Outcome:

Business Environment and Domain Knowledge

The graduates of this course will be able learn about the role of economics in business management and prospects of the business in a span of time.

Suggested Readings:

1.	V.C. Sinha & Ritika Sinha	:	Managerial Economics
2.	P. L. Mehta	:	Managerial Economics
3.	Varshney & Maheshwari	:	Managerial Economics
4.	Joel Dean	:	Managerial Economics
5.	M. L. Jhingan	:	Micro Economic Theory

CC 104: BUSINESS ENVIRONMENT

Course Credits: 03 **Max. Marks in Theory Paper: 60**

Objective: The primary objective of this course is to familiarize the students with the business environment prevailing in India, its different dimensions, influencing factors and its implications to business.

Course Contents:

UNIT I: Business and Environment

Definition, Nature and Components of Business; Concept, Classification and Significance of Business Environment, Factors affecting environment of Business ; Assessing risk and opportunity in Indian and global business environment. Environment Management System (EMS), EMS Standards and Environmental Auditing.

UNIT II: Economic Environment

Components of Economic Environment of Business ; Basic Economic System ; Role of Five Year Plans to Industry ; Economic Reforms in India- Liberalisation, Globalisation and Privatisation ; New Economic Policy ; Industrial Policy ; Concept of Fiscal Policy & Monetary Policy.

UNIT III: Socio-cultural and Political Environment

Social Environment and its impact on Business; Role of culture in business, Social Responsibility of business; State Intervention in Business - Reasons, Types and Problems ; Concept of Private and Public Sector in India; Co-operative Organizations, MNCs and FDI in India.

UNIT IV: Technological Environment

Technological factors affecting business; Technology Policy of India; Prospects and Challenges to adopt technology; Role of Patents and Intellectual Property Rights in Business; Quality Standards and introduction of Six Sigma & Kaizen.

UNIT V: Environmental Management

Concept, Scope and Determinants of Environmental Management System; Introduction of Sustainable Development; Role and Trade of Forest Products in India ; Bio-Diversity & Waste Management ; Air, Water and Land Pollution-Causes and Laws ; Measures of Energy Conservation. Overview of Environment Protection Act.

Outcome:

Business Environment and Domain Knowledge

The participants of this course will be able learn about the macro factor affecting business environment and will be well acquainted with the latest changes in the different components of business environment.

Suggested Readings:

1.	Principles of Business Management	:	Kumar & Sharma
2.	Business Environment	:	F. Cherunilum
3.	Economic environment of Business	:	Biswnath Ghosh
4.	Business Environment for Strategic Management	:	K. Aswathappa
5.	Indian Economy	:	Mishra and Puri

List of Cases, Recent Articles and Specific References will be announced in the Class Room at the time of launching of the course.

CC 105 CP: BUSINESS COMMUNICATION

Course Credits: 03 **Max. Marks in Theory Paper: 60**

Objective: This Course is aimed at equipping the students with the necessary techniques and soft skills of communicating individually and in a group. Oral, written and non-verbal communication skills are considered important in accomplishing the organisational goals and maintaining harmony.

Course Contents:

UNIT I: Introduction
Definition and Process of Communication, Essentials of Effective Communication, Barriers to Communication, Communication Networks, Role of communication in organizational effectiveness, Use of Grapevine.

UNIT II: Oral Communication
Public Speech & Presentation Skills: Composition, Principles, Speech Delivering Skills, Overcoming Glossophobia, Just-A-Minute Presentation. Interview: Pre Planning for the Interview, Facing the Interview Board. Communication in Group Discussion, Do's and Don'ts in GD's. Communication in Committees, Seminars and Conferences.

UNIT III: Non-Verbal Communication
Non- Verbal communication: Meaning and its Importance. Facial Expressions, Postures, Gestures, Eye Contact & Gazing, Hepatics, etc. Listening: Process, Types and Principles.

UNIT IV: Writing Skills
Writing different types of Job Application Letters. Preparing Bios & Resumes. Writing different types of Reports, Proposals, E-mails and Summaries. Drafting Notices, Advertisements etc.

UNIT V: Business Correspondence
Essentials of Effective Business Correspondence. Structure of Business Letter, Forms of Letter layout. Types of Business Letters- Enquiries and replies, orders and their execution, complaint letter, sale letter, Response Letter, Thanks Letter.

Outcome:
Effective Communication
The participants of this course will be able learn about the various aspects of verbal and non-verbal communication which will be extremely useful to them at the entry level in any professional organisation in the initial years of their career.

Suggested Readings:

1.	Nageshwar Rao & R. P. Das	:	Communication Skills
2.	M. V. Rodrigues	:	Effective Business Communication
3.	R. C. Sharma & Krishna Mohan	:	Business Correspondence & Report Writing
4.	E. H. McGrath, S. J.	:	Basic Managerial Skills for All
5.	P. D. Chaturvedi & Mukesh Chaturvedi	:	Business Communication

List of Cases, Recent Articles and Specific References will be announced in the Class Room at the time of launching of the course.

CC 106: ACCOUNTING FOR MANAGERS

Course Credits: 03 **Max. Marks in Theory Paper: 60**

Objective:
The basic purpose of this course is to develop an insight of postulates, principles and techniques of accounting and utilisation of financial and accounting information for planning, decision making and control.

Course Contents:

UNIT I: Basic Accounting Concepts
Financial Accounting: Concept, Importance and Scope. Generally accepted accounting principles, Preparation of Financial Statement with special reference to analysis of Balance Sheet and measurement of Business Income.

UNIT II: Financial Statements
Financial Statements analysis, Cash Flow Statement, Fund Flow Statement , Ratio Analysis – Meaning, Importance and Limitations. Preparation of various types of statements.

UNIT III: Management Accounting
Management Accounting - Concept, Need, Importance and Scope. Cost Accounting- Records & Process, Cost Ledger & Control Accounting, Job and Process Costing. Reconciliation & Integration between Financial Accounting and Cost Accounting.

UNIT IV: Budgeting
Various types of budget and their preparation, Master Budget, Flexible Budget, Performance Budgeting, Zero Budgeting and Budgetary Control.

UNIT V: Costing
Costing for Decision Making: Standard Costing, Variance Analysis, Marginal Costing and Absorption Costing. Overview of GST.

Outcome:
Business Environment and Domain Knowledge
This course will acquaint the participants with the basics of accountancy regarding financial transactions of an organisation.

Suggested Readings:

1. S. M. Shukla	:	Advanced Accounting
2. Sharma & Gupta	:	Management Accounting
3. Jain & Narang	:	Accountancy
4. I. M. Pandey	:	Advanced Accounting
5. Shukla & Grewal	:	Advanced Accountancy

CC 107: ICT & E-BUSINESS FUNDAMENTALS

Course Credits: 03 **Max. Marks in Theory Paper: 60**

Objective:

The objective of this course is to give an exposure to the participants regarding the usage of computers software, ICT, E-Business Fundamentals and emerging technologies in the business organisation with the specific reference to the commercial data processing systems.

Course Contents:

UNIT l: Introduction

Computers: An Introduction, Development of Computer, Components of Computer, System: - CPU, Input and Output Devices, Storage Media, Computer Hardware/Software Generations, Classification of Computer Programming Languages. Overview of Number System, Information Technologies, Internet Communication Technologies. Applications of Computer in Business.

UNIT II: PC Software Package

Operating System: Introduction to Operating System (DOS & Windows). Basics of Word Processing Insert, Page Layout, References and Mailings. Basics of Excel/Spreadsheet: Data Formatting, Data Representation & Data Visualization. Power Point: Creating a PowerPoint Presentation on PC. Do's and Don'ts of Power Point Presentation.

UNIT III: E-Business:

E-Business framework, E-Business application, Technology Infrastructure for E-Business. Mobile and Wireless computing fundamentals: Mobile computing, framework, wireless technology and switching method, mobile information access device, mobile computing application.

UNIT IV: E-Business Models:

Elements of Business models, B2B, B2C models Payment Systems: Type of E-payment, digital token-based e-payment, smart card, credit card payment systems, risk on e-payment, designing e-payment.

UNIT V: Emerging Technologies

Communication Technologies: 2G, 3G, 4G and 5G, Artificial Intelligence (AI), Internet of Things (IoT), Machine Language, Big Data, Coding, Cloud Computing, Cyber Security etc.

Outcome:

Critical Thinking, Business Analysis, Problem Solving and Innovative Solutions

This course will hone the skills of participants with basics of computers, ICT, office automation, E-Business and emerging technologies. It will also improve the critical thinking, analytical ability and problem solving skills of the participants.

Suggested Readings:

1. Sinha and Sinha, "Computer Fundamentals", BPR Publications , Latest Edition
2. Niranjan Shrivastava, Computer Applications in Management
3. R.K. Taxali,, "PC Software for Windows Made Simple", Tata McGraw Hills, New Delhi,
4. R Kalakoita & M Robinson. "E-Business. Roadmap for Success", Pearson Education.
5. Rayudu C. S. ,"e-Business", Himalaya Publishing House, Latest Edition
6. Elaine Rich and Kevin Knight, "Artificial Intelligence", Tata McGraw Hill
7. V. Madisetti & A. Bahga, "Internet of Things, A Hands on Approach", University Press.
8. Gupta Sarika, "Information and Cyber Security", Khanna Publishing House, Delhi.
9. Jain V.K., "Big Data and Hadoop", Khanna Publishing House, Delhi.
10. Aurélien Géron, "Hands-On Machine Learning with Scikit-Learn and Tensor Flow: Concepts, Tools, and Techniques to Build Intelligent Systems", 1st Edition, O'Reilly Media

GE 108: ORGANISATIONAL BEHAVIOUR & INDUSTRIAL PSYCHOLOGY

Course Credits: 04 **Max. Marks in Theory Paper: 60**

Objective:

The objective of this course is to develop an understanding of organisational and individual variants of human behaviour which affect the functioning of an organisation.

Course Contents:

UNIT I: Introduction

Concept of Organisational Behaviour, Contributing Disciplines to Organisational Behaviour, Background/ Historical Perspective and Framework of OB, Organisational Behaviour in a Learning Organisation.

UNIT II: Individual Behaviour & Group Dynamics

Perception and Impression Management, Personality- Concept and Determinants, Attitudes and Values. Group Formation, Nature of Groups, Group norms, Reasons for joining Groups, Individual Roles in Groups., Functions of Groups within an Organisation.

UNIT IV : Global Leadership

Cultural Dimensions & its impact on Business Practices. Leadership Across Culture, Challenging role of a Global Manager as a Global Business Leader. Challenge of Managing Cross-Cultural Workgroups and International Teams. Cross-Cultural Communication & Negotiations. Cultural differences & Ethical dilemmas.

UNIT IV: Industrial Psychology

Evolution of Industrial Psychology, Psychological Conflicts: Causes, Effects and Remedies. Role Clarity & Role Conflict, Work Life Balance, Causes of Monotony, Fatigue, Accidents and Alcoholism in Employees, Employee Retention Strategies.

UNIT V: Other Issues

Emotional Intelligence: EI Framework, Role of EI on individual and organisational effectiveness. Stress Management- Meaning, Causes, Effects and Coping Strategies for Stress and Interpersonal Behaviour. Creating High Performance Culture. Mentoring & Talent Management. Team Building & Team Work, Time Management.

Outcome:

Leadership, Teamwork, Global Exposure and Cross Cultural Understanding

The participants of this course will be able to learn about behavioural aspects of different individuals and groups in an organisation. Graduates are expected to collaborate and lead teams across organisational boundaries and demonstrate leadership qualities. The participants will be able to learn about the various aspects of trans-national culture and global leadership.

Suggested Readings:

1. Stephens P. Robbins	:	Organisational Behaviour
2. Keith Davis	:	Organisational Behaviour
3. Uma Shekaran	:	Organisational Behaviour
4. Udai Pareek	:	Understanding Organisational Behaviour
5. A. Negi	:	Industrial Psychology

List of Cases, Recent Articles and Specific References will be announced in the Class Room at the time of launching of the course.

SEMESTER II

CC 201: INDIAN ETHOS & BUSINESS ETHICS

Course Credits: 04 **Max. Marks in Theory Paper: 60**

Objective: This is a value based course. The objective of this course is to acquaint the students with the moral values and traditional wisdom inherent in our Indian mythology and literature.

Course Contents:

UNIT I: Introduction

History and Relevance, Role of Indian Ethos in Managerial Practices, Principles Practiced by Indian Companies. Managerial Lessons from Vedas, Ramayan, Mahabharat, Bible and Quran. Kautilya's Arthshashtra.

UNIT II: Indian Values

Indian Heritage in Management. Impact of Value on Stakeholders, Trans-Cultural Human Values, Secular v/s Spiritual Values, Value System in Work Culture. Meditation, Mental Health and Yoga. Gurukul System of Learning. Gandhian Approach in Management & Trusteeship. Importance of Trusteeship Principles in Business Management.

UNIT III: Ethos & Laws

Ethics v/s Ethos, Indian v/s Western Management, Work Ethos and Values for Indian Managers. Relevance of value based management in Global Change. Nishkama Karma, Law of Karma, Law of Creation, Law of Humility, Law of Growth, Law of Responsibility, Law of Connection and Corporate Karma Leadership.

UNIT IV: Understanding Ethics

Need for Ethics, Ethical Values, Myths and Ambiguity, Ethical Codes, Ethical Principles in Business. Theories of Ethics, Absolutism v/s Relativism. Kohlberg's six stages of Moral Development (CMD).

UNIT V: Managing Ethical Dilemma

Ethical Decision Making, Ethical Reasoning, Dilemma Resolution Process. Ethical Dilemma in different business areas of Finance, HRM, Marketing and International Business. Ethics and Value Based Leadership. Traditional Indian Wisdom towards Business Ethics.

Outcome: Value based learning & Leadership

The participants of this course will be able to learn values from Indian mythology and Role Models and use them in sustainable growth of business organisations.

Suggested Readings:

K.C. R. Raja	:	Ethics, Indian Ethos & Management
Bishwanath Ghosh	:	Ethic in Management & Indian Ethos
R. Nandgopal & AjithSankar R. N.	:	Indian Ethos & Values in Management
G. D. Sharma	:	Management & Indian Ethos
S. K. Chakraborty	:	Ethics in Management :Vedantic Perspective

CC 202: RESEARCH METHODOLOGY

Course Credits: 03 **Max. Marks in Theory Paper: 60**

Objective: The aim of this course is to equip the participant with the basic understanding of the research methodology and to provide an insight into the application of modern analytical tools and techniques for the purpose of managerial decision making.

Course Contents:

UNIT I: Introduction
Meaning, Objectives, and Significance of Research; Types of Research; Concept and scope of research methodology in Management; Criteria for a good Research ; Research Organisations in India.

UNIT II: Research Process
Steps in Research Process. Need and Features of a good Research Design; Types of Research Design; Sampling Design Techniques; Characteristics of a good Sample Design; Formulation of Research Objectives and Hypothesis.

UNIT III: Methods of Data Collection
Types of Data. Sources of secondary data; Review of Literature and its importance. Methods of Collecting Primary Data; Observation, Interview & Questionnaire Method. Designing and Administration of Questionnaire. Questionnaire vs Schedule. Measurement & Scaling Techniques.

UNIT IV: Methods of Data Representation & Analysis
Use of Graphs, Charts and Maps in Data Representation. Processing of data- Editing, Coding, Classification and Tabulation of Data; Utility and Importance of Statistics in Research ; Measures of Central Tendency and Dispersion, Correlation and Regression etc. Statistical tests such as Chi - square test, t – test, and ANOVA.

UNIT V: Research Report Preparation
Preparation of Research Reports; Layout of the Research Report; Steps in Report Writing ; Applications of MS Word, Power Point and Excel in Report Preparation ; Research related Software and their application.

Outcome:
Critical thinking, Business Analysis, Problem Solving and Innovative Solutions
This course will acquaint the participants with the basics of research before they go to the corporate world for their project study. This will also cultivate critical thinking, analytical skills and problem solving skills in the participants.

Suggested Readings:

1. Research Methodology : C.R. Kothari
2. Research Methodology : R. Pannersevam
3. Research Methodology in Management : Dr. V.P. Michael
4. Business Research Methods : Naval Bajpai
5. Marketing Research : Malhotra & Dash

CC 203: HUMAN RESOURCE MANAGEMENT

Course Credits: 03 **Max. Marks in Theory Paper: 60**

Objective:

The objective of this course is to acquaint the participants about the various facts of managing manpower and to develop an insight on various policies and practices of Human Resource Management.

Course Contents:

UNIT I: Introduction

Concepts & Perspectives on Human Resource Management, HRM in Changing Environment, Corporate Objectives and Human Resource Planning, Career & Succession Planning, Job Analysis and Job Description.

UNIT II: Recruitment and Training

Recruitment and Selection of Manpower, Induction and Orientation, Training and Development, Performance Appraisal and Potential Appraisal.

UNIT III: Compensation

Job Evaluation, Wages and Salary Administration. Employee Benefit Programmes, Incentives and Fringe Benefits. Organiational Participation and Productivity Sharing.

UNIT IV: Managerial Skills

Introducing change in the organization, Discipline, Absenteeism and Employee Turnover, Conflict Management, Grievance Handling. Work from home in contingencies such as pandemic situation.

UNIT V: Industrial Relations

Employee Welfare, Industrial Relations and Trade Unions; Dispute Resolution & Grievance Management; Employee Empowerment.

Outcome:

Business Environment and Domain Knowledge

This course will ensure the basic learning of managing human resource in an organisation and participants will also gain understanding of influence of external environment forces on HRM.

Suggested Readings:

1. Gary Dessler : Fundamentals of Human Resource Management
2. K. Aswathappa : Human Resource and Personal Management
3. C.B. Memoria : Personnel Management
4.. Deeepak Kumar Bhattacharya : Human Resource Management
5. V.S. P. Rao : Human Resource Management

List of Cases, Recent Articles and Specific References will be announced in the Class Room at the time of launching of the course.

CC 204: FINANCIAL MANAGEMENT

Course Credits: 03 **Max. Marks in Theory Paper: 60**

Objective:

The basic purpose of this course is to develop an insight of postulates, principles, and techniques of financing and utilization of financial and accounting information for planning, decision making and control.

Course Contents:

UNIT I: Introduction

Financial Management – Nature, Scope & Objectives, Financial Analysis & Control, Cost Volume Profit Analysis, Valuation of a Firm, Business Forecasting.

UNIT II: Short Term Financing

Working Capital Management, Management of Cash & Receivables, Accounts and Receivables Management, Inventory Management, Debt Financing, Bank Financing.

UNIT III: Capital Structure and Dividends

Capital Structure Decision of a firm, Theories of Capital Structure, Dividend Policy of the Firm, Valuation &Dividend Decisions.

UNIT IV: Long Term Financing

Sources of Long Term funds externally: Long term Debt, Preferred & Common Stock, Convertible Securities & Warrants, Lease Financing.

UNIT V: Investment Decisions

Capital Budgeting, Methods of Capital Budgeting, Cost of Capital for Risky Investment, Multiple Risky Investment, Portfolio Management.

Outcome:

Business Environment and Domain Knowledge

Graduates will improve their knowledge on functioning of local and global business environment and will be acquainted about various aspects related to sources of funds and management of funds in an organisation.

Suggested Readings:

1. Khan & Jain : Financial Management
2. I.M. Pandey : Financial Management
3. S. K. Gupta & R. K. Sharma : Financial Management
4. Prasanna Chandra : Financial Management: Theory & Practices
5. V. K. Bhalla : Financial Management and Policy

List of Cases, Recent Articles and Specific References will be announced in the Class Room at the time of launching of the course.

CC 205: MARKETING MANAGEMENT

Course Credits: 03 **Max. Marks in Theory Paper: 60**

Objective:

The objective of the course is to introduce the students to the basic concepts and components of marketing so as to develop an understanding of different functional areas of management irrespective of the selected area of specialisation.

Course Contents:

UNIT I: Introduction

Basic Concepts and Approaches to Marketing Management, Selling vs. Marketing, Marketing System, Marketing Environment, Marketing Mix, Market Segmentation and Marketing Process. Targeting & Positioning.

UNIT II: Consumer Behaviour & Marketing Research

Concept of Consumer Behaviour, Factors affecting Consumer Behaviour. Decision Making Process in Buying. Diffusion of Innovation. Types & Levels of Decision Making in Buying. B2B Marketing and CRM. Concept and Components of Marketing Information System (M_kIS). Marketing Research: Meaning, Process, Scope and Significance.

UNIT III: Product & Brand Management

Product Mix, Product Classification, Product Life Cycle, Launching of a New Product. Branding Decisions & Strategies: Selecting a Brand Name, Brand Identity, Personality & Associations. Packaging: Functions & Types, Legal Dimensions of Packaging, Packaging as a Promotional Tool.

UNIT IV: Pricing, Promotion & Distribution Management

Pricing Objectives & Methods. Factors influencing Pricing of a Product. Promotional Decisions- Advertising, Sales Promotion, Personal Selling, Publicity and Public Relations. Promotion Mix. Channels of Distribution, Channel Planning & Channel Mix, Factors Affecting Channel Choice. Types of Middlemen. Functions of Middlemen, Utility Created by Middlemen.

UNIT V: Specific Marketing Areas

Service Marketing, Rural Marketing, Green Marketing, International Marketing, Social & Non-Profit Marketing, Social Media & Digital Marketing. Marketing to base of Pyramid Customers.

Outcome:

Business Environment and Domain Knowledge

The participants of this course will be able to learn about the foundation of marketing in different focal areas and they will also understand the impact of various factors on marketing activities.

Suggested Readings:

1. Ramaswami V. & Namkumari S., : Marketing Management.
2. Kumar Arun & Meenakshi N. : Marketing Management
3. Kotler Philip, Keller K.L., Koshy Abraham Jha M. : Marketing Management
4. Stanton W. J., : Fundamentals of Marketing
5. KujnishVashishth : A Practical Approach to Marketing Management

List of Cases, Recent Articles and Specific References will be announced in the Class Room at the time of launching of the course.

CC 206: PRODUCTION AND OPERATIONS MANAGEMENT

Course Credits: 03 **Max. Marks in Theory Paper: 60**

Objective:
This course is designed to acquaint the participants with decision making in Planning, Scheduling and control of Production and Operation function in both manufacturing and services.

Course Contents:

UNIT I: Introductory Concept to Operations
Nature and of Production and Operations Management, Facility Location, Types of Manufacturing Systems & Layouts, Layout Planning and Analysis Material Handling- Principles Equipments, Line Balancing- Problems.

UNIT II: Operational Planning
Operations decisions- Production Planning and Control – In Mass Production – In Batch/Job Manufacturing Capacity Planning – Models.

UNIT III: Process Planning
Process Planning – Aggregate Planning- Scheduling- Maintenance Management Concepts, Work Study, Method Study, Work Measurement, Work Sampling, Work Environment – Industrial Safety.

UNIT IV: Material Management
Material Management: An Overview of Material Management, Material Planning and Inventory, Control, JIT, Materials Planning Budgeting and Material Requirement planning, Purchase Management, Stores Management.

UNIT V: Quality Control
Quality Assurance: Acceptance Sampling, Statistical Process Control, TQM, ISO 9000, Maintenance, Safety Management.

Outcome:
Business Environment and Domain Knowledge
This course will expose the participants with various aspects of manufacturing sector. They will be able to improve productivity in operations through layout engineering, quality management, effective and efficient flow, replenishment and control of materials in manufacturing organisations.

Suggested Readings:

1. Buffa, E.S. : Modern Production Management
2. Chary S.N. : Production and Operations Management
3. Chunawalla & Patel : Production and Operation Management
4. Subimal Bhattacharya : Operations Management
5. K. K. Ahuja : Production Management

List of Cases, Recent Articles and Specific References will be announced in the Class Room at the time of launching of the course.

CC 207: BUSINESS LEGISLATION

Course Credits: 03 **Max. Marks in Theory Paper: 60**

Objective:
The course is designed to assist the students in understanding basic laws affecting the operations of a business enterprise.

Course Contents:

UNIT I: Contract Act.
The Indian Contract Act, 1872: Essentials of valid Contract. Void Agreements. Performance of contracts, Breach of Contract and Its remedies. Quasi-Contracts. Indemnity. Guarantee Contingency, Bailment and Agency.

UNIT II: Sales of Goods Act & Negotiable Instruments Act
The Sale of Goods Act, 1930: Formation of a Contract .Right of Unpaid Seller. The Negotiable Instruments Act, 1881: Nature and Types. Negotiation and Assignment. Holder–in-Due Courses Dishonour and Discharge of a negotiable Instrument.

UNIT III: Introduction to Company Law
The Companies Act 1956:Nature and Types of Companies. Formation. Memorandum and Articles of Association, Prospectus.

UNIT IV: Share Capital
Allotment of Shares. Shares and Share Capital. Shares vs Debentures Membership, Borrowing Powers. Management and Meeting. Accounts and Audit. Compromise Arrangements and Reconstruction.

UNIT V : Other Issues
Prevention of Oppression and Mismanagement. Winding UP: Consumer Protection Act and Cyber Laws.

Outcome:
Business Environment, Domain Knowledge, Critical Thinking & Problem Solving
The course will acquaint the participants with functioning of legal business environment and concerned potential issues and laws in managing operations of business and thereby they are expected to make judgment calls and take legit decisions in future that a business professional has to make on daily basis. This course will prepare the participants for imaginative and responsible leadership roles in the business. They are expected to critically analyze, evaluate and create solutions in the business.

Suggested Readings:

1. Anurag k. Agrwal, Business Law for Managers, Penguin.
2. Avtar Singh, Company Law, Eastern Book Company, Lucknow.
3. Garg & Chawla, Mercantile Law, Kalyani Publishers.
4. Kapoor N.D., Mercantile Law, Sultan Chand & Sons, New Delhi.
5. Kuchhal & Kuchhal, Business Legislation for Management, Vikas Pub. Ltd.

The list of cases and specific references including recent articles will be announced in the class at the time of launching of the course.

GE 208: INTERNATIONAL BUSINESS ENVIRONMENT

Course Credits: 04 **Max. Marks in Theory Paper: 60**

Objective:

The primary objective of this course is to acquaint the students to emerging global trends in business environment and enhance the knowledge about the foreign markets.

Course Contents:

UNIT I: Introduction

International Business: An overview- Types of International Business. The External Environment: Economic and Political Environment, The Human Culture Environment and its influence on Trade and Investment Patterns.

UNIT II: World Trade

Recent World Trade and Foreign Investment Trends, Balance of Payments and Balance of Trade, Theories related with International Trade. World's Economic Growth & Environment.

UNIT III: International Finance

World Financial Environment: Cross-national Cooperation and Agreements, Tariff and Non-Tariff barriers, WTO, GATT, Regional Blocks.

UNIT IV: Financial Institutions

Foreign Exchange Market Mechanism, Determinants of Exchange rates, Euro-Currency Market, Offshore Financial Centres, International Banks, Non-Banking Financial Services Firms, and Stock Markets.

UNIT: Global Issues & Perspectives

Global Competitiveness: Technology and Globalisation, Export Management, Licensing & Joint Ventures, Globalisation and Human Resource Development, Globalisation with Social Responsibility.

Outcome:

Global Exposure and Cross Cultural Understanding

The participants will be able to learn about the various aspects of global business environment. They will have basic knowledge about different mechanisms and institutions in International Business.

Suggested Readings:

1.	Leslie Hamilton & Philip Webster	:	The International Business Environment
2.	Anant Kumar	:	The International Business Environment
3.	Bhalla, V.K. and S. Shivaramu	:	International Business Environment and Business
4.	Janet Morrison	:	The International Business Environment
5.	Sukumar Nandi	:	The International Business Environment

List of Cases, Recent Articles and Specific References will be announced in the Class Room at the time of launching of the course.

SEMESTER :III

CC 301: OPERATIONS RESEARCH

Course Credits: 04 **Max. Marks in Theory Paper: 60**

Objective:
The objective of this course is to give the students a firm grasps of quantitative techniques, which are useful to them in the field of management. The emphasis is mainly laid on operational research.

Course Contents:

UNIT I: Introduction to OR
Introduction, Nature, Scope and Managerial Application, Methodology/Modelling in OR, Types of Models, Principles of Modelling in OR. Overview of various OR Models used in Business.

UNIT II: Linear Programming
Linear Programming, Introduction, Formulation, Graphical and Simplex Method for solving L.P.P Maximisation & Minimisation Type Problems, Big m and Two –Phase Methods. Sensitivity Analysis, Dual of a Linear Programming Problem.

UNIT III: Operational Models
Transportation Problems: Formulation, Basic Feasible Solution and optimality test, Assignment Problems: Minimisation types, constraints, unbalanced and maximization type, Monte Carlo's Simulation (Elementary concept).

UNIT IV: Operational Network
PERT & CPM: Basic concepts, Rules of Network Construction Determination of Critical Path, Determination of Float. Determination of Project Completion Time. Dynamic Programming. (Elementary concept).

UNIT V: Operational Theories
Game Theory: Type of Game. Two Person Zero Sum Game, Saddle Point. Dominance Rule, solution to 2x2, 2xn and mx2 games. Queuing Theory: General Structure of a Queuing System, Operating Characteristics of a Queuing System, Simple problems related to Queuing. Replacement Theory (Elementary concept).

Outcome:
Critical thinking, Business Analysis, Problem Solving and Innovative Solutions
Competency in quantitative techniques will hone the critical thinking, analytical skills and problem solving ability of the participants. They are expected to use these techniques to solve the problems under uncertainty and take appropriate decisions in the business world.

Suggested Readings:

1. Vohra N.D., Quantitative Techniques in Management, New Delhi, TMH.
2. Sharma S.D., Operations Research
3. Hira D.S. & Gupta P.K., Operations Research, S. Chand & Company Ltd.,
4. Sharma J.K., Operational Research: Theory and Applications, Trinity.
5. H. A. Taha, Operations Research – An Introduction, Pearson.

DCE 302 A: CONSUMER BEHAVIOUR

Course Credits: 04 **Max. Marks in Theory Paper: 60**

Objective:
The basic objective of this course is to develop an understanding about the consumer decision-making process and its applications in marketing function of firms.

Course Contents:

UNIT I: Introduction
Introduction to Consumer Behaviour: Consumer Behaviour and Marketing Strategy: Consumer Involvement and Decision Making: Information Search Process: Evaluation Criteria and Decision Rules.

UNIT II: Motivation & Personality
Consumer Motivation: Needs and Goals, Positive & Negative Motivation of Consumers towards products, Dynamic Nature or Consumer Motivation, Consumer Perception: Conceptual Framework, Dynamics of Perception, Consumer Imaging.

UNIT III: Attitude & Personality
Consumer Attitude and Attitude Change: Influence of Personality and Self Concept on Buying Behaviour: Psychographics and Lifestyle: AIO & VALS Classification.

UNIT IV: Influence on CB
Reference Group Influence: Diffusion of Influence: Diffusion of Innovation Process, The concept of Chasm: Profile of Consumer Involvement and Opinion Leadership, Family functions and family life style. On-line Buying Behaviour, Influence of E-marketing on Buying Behaviour.

UNIT V: CB Models & Application
Models of Consumer Behaviour: Nicosia Model: Howard Sheth Model, Engel Blackwell Julia Model, Industrial Buying Behaviour Consumer Behaviour Studies in India.

Outcome:
Business Environment, Domain Knowledge, Social Responsiveness & Ethics
This course provides a valuable insight on how consumers make buying decisions and how different factors affect their buying decisions. The graduates are expected to identify the problems and tap the opportunities in the market by formulating smart marketing strategies and filling the gap between consumers' expectations and company's products & services. The participants will gain an understanding of social issues & problems in the society and will be able to explore solutions to it within ethical boundaries which would further affect consumer judgment and buying decision positively**.**

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Suggested Readings:

1. Schiffman, LG and Kanuk, LL Consumer Behaviour New Delhi, PHI.
2. Mowen, John C. – Consumer Behaviour, New York, Mac Millan.
3. Engle JF etc, Consumer Behaviour in Marketing, Engle wood Cliffts, New Jersey, PHI.
4. Michel R. Soloman, Consumer Behaviour, Pearson.
5. Matin Khan, Consumer Behaviour, New Age International Publication.

The list of cases and specific references including recent articles will be announced in the class at the time of launching of the course.

DCE 302 B: INVESTMENT ANALYSIS & PORTFOLIO MANAGEMENT

Course Credits: 04 **Max. Marks in Theory Paper: 60**

Objective:
The objective of this course is to impart knowledge to students regarding the theory and practice of Investment Analysis and practices of Portfolio Management.

Course Contents:

UNIT I: Investment Management
Investment – Return and Risk: Operation of Indian Stock Market; New Issue Market; Listing of Securities: cost of Investing in Securities: Mechanics of Investing Markets and Brokers: Investment Companies , Market Indices and Return .

UNIT II: Security Analysis
Security Credit Ratings; Objective of Security Analysis; Investment Alternatives; Valuation Theories of fixed and variable income Securities; The Return to Risk and the Investment Decision; Government Securities; Non Security Form of investment.

UNIT III: Stock Market
Market: Stock Market Analysis- Fundamental and Technical Approach, Efficient Market Theory; Recent Development in Indian Stock Market; Investment Instruments of the Money. Derivatives-Contract, Future market & Hedging, Swap, Option pricing, Commodity & Derivative Markets in India.

UNIT IV: Portfolio Management
Introduction to Portfolio Management – An optimum portfolio – Selection Problem, Markowitz Portfolio Theory, The Nature of Investment Risk, MVC and Portfolio Selection, Portfolios of two Risky Securities, A Three Security Portfolio, the Efficient Frontier.

UNIT V: Managed Portfolios and Performance Measurements
Sharpe: Single Index Model; Application of Market Model in Portfolio Construction Capital Assets Pricing Model, Constructing the Optimum Portfolio, Portfolio Investment Process: Bond Portfolio Management Strategies : Investment timing and Portfolio Performance Evaluation : Corporate Portfolio Management in India .

Outcome:
Critical Thinking, Business Analysis, Problem Solving and Innovative Solutions
The participants will acquire knowledge on techniques and strategies used to manage funds and assets of the organization. This will refine their analytical skills, problem solving and they will be able to plan and execute investment decisions by gauging the risk patterns effectively thereby managing the portfolio of the organization effectively.

Suggested Readings:

1. Yogesh Maheshwari, Investment Management, PHI, New Delhi.
2. Bhalla, V.K., Investment Management: Security Analysis & Portfolio Management, S Chand, New Delhi.
3. Fisher Donald E and Jordan, Ronald J. Security Analysis and Portfolio Management, PHI, New Delhi.
4. Sharpe, Willam F., Investment. PHI, New Delhi.
5. S. S. Kaptan, Investment Management, Sarup & Sons, New Delhi.

The list of cases and specific references including recent articles will be announced in the class at the time of launching of the course.

DCE 302 C: EMPLOYEE RELATIONS

Course Credits: 04 **Max. Marks in Theory Paper: 60**

Objective:
Organisational efficiency and performance are intricately interlinked with industrial relations. This course is an attempt to appreciate the conceptual and practical aspect of employee relations at the micro and macro levels.

Course Contents:

UNIT I: Introduction
Industrial Relations Perspectives: Industrial Relations and The Emerging Socio-economic Scenario: Industrial Relations and the State : Legal framework of industrial Relations.

UNIT III: Employee Grievance & Participation
Discipline and Grievance Management: Negotiation and Collective Settlements: Participative Management and co-ownership: Productive Bargaining.

UNIT III: ILO & IR
Industrial Unrest in India, ILO, India and ILO, Dunlop's Industrial Relations Model. Employee Empowerment, Quality Management.

UNITI V: Industrial Relation Code 2020
Preliminary, Bi Parity Forum, Trade Unions, Standing Orders, Notice of Change, Voluntary Reference of Dispute and Arbitration. Mechanism for Resolution of Industrial Dispute, Strikes & Lock-outs, Special Provisions Related to Lay Offs, Retrenchment & Closure in Certain Establishment. Factories Act 1948.

UNIT V: Occupational Safety, Health & Working Condition Code 2020
Preliminary, Registration, Duties of Employer & Employees, Occupational Safety & Health, Health Safety & Working Conditions, Welfare Provisions, Hours of Work & Annual Leave with Wages, Maintenance of Registers, Records & Returns, Inspector cum Facilitator and Other Authority. Special Provisions related to employment of Women, Special Provisions for Contract Labour, Offences & Penalties, Social Security Fund.

Outcome:
Business Environment and Domain Knowledge
The participants will learn social and political influences of labour relations on business and thereby it will help them to deal with the realities of managing a business in the complex world.

Suggested Readings:

1. Das R.P., Management of Industrial Relations, Varanasi , K Krishna Trading Corp.
2. Agrawal S.N., Labour Relations Law in India.
3. Taxman Labour Laws.
4. Menal Arora, Industrial Relations, Excel Books.
5. The Gazette of India (Extraordinary 8 Aug 2019, 29 Sept 2019)

The list of cases and specific references including recent articles will be announced in the class at the time of launching of the course.

DCE 303A: SALES AND DISTRIBUTION MANAGEMENT

Course Credits: 04 **Max. Marks in Theory Paper: 60**

Objective:
The purpose of this course is to acquaint the students with the concepts which are helpful in developing a sound sales and distribution policy and in organizing and managing sales force and marketing channel.

Course Contents:

UNIT I: Selling Process & Concepts
Nature and Scope of Sales Management: Setting and Formulating Personal Selling Objectives, Sales Theories, Steps in Selling Process, Pre- requisite of a Good Sales Personnel.

UNIT II: Management of Sales Force
Recruiting and Selecting Sales Personnel: Developing and Conducting Sales Training Programme, Designing and Administrating Compensation Plans: Supervision of Salesman: Motivating Sales Personnel: Sales Meeting and Sales Contest.

UNIT III: Sales Planning & Evaluation
Process of Sales Planning, Designing Territories and Allocating Sales Efforts: Size and Type of Sales Force. Objectives and Quotas for Sales Personnel: Developing and Managing Sales Evaluation Programme.

UNIT IV: Channel Management
Structure and Types of Marketing Channels. B2B Marketing. Functions of Intermediaries, Wholesaling, Nature, Important & Classification. Channel Planning: Channel Integration, Intensity of Market Coverage, Selection of Distribution Channels and Channel Associates, Behaviour of Channel Member, Legal Issues in Channel Management. Power & Conflicts in Channel Management.

UNIT V: Retail Management
Understanding Shoppers, Delivering Value through Retail Format, Store Layout and Design, Supply Chain Management (SCM), Technology in Retailing and E-retailing, In-store Technologies, Technology-Human Interface. POP Displays & Retail Marketing, Strategic Issues and Recent Trends in Retailing.

Outcome:
Business Environment and Domain Knowledge
This course gives an understanding of sales, distribution & retailing in Indian business. The graduates are expected to develop responsiveness towards challenges of increasing competition in the business world by resorting to improved methods of sales & distribution aimed at reducing cost, increasing profits and fulfilling the customers' expectations.

Suggested Readings:

1. Stanton, William J. Management of Sales Force, Chicago, Irwin.
2. Johnson, E M etc. Sales Management: Concept Practices and Cases. New York, John Wiley.
3. Anderson, R. Professional Sales Management: Englewood Cliffs, New Jersey, PHI.
4. Panda & Sachdev, Sales & Distribution Management, Oxford
5. U.C. Mathur, Sales & Distribution Management, New Age International Pub. Ltd.

The list of cases and specific references including recent articles will be announced in the class at the time of launching of the course.

DCE 303 B: INTERNATIONAL FINANCE

Course Credits: 04 **Max. Marks in Theory Paper: 60**

Objective:
The objective of this course is to give students an overview of the International Financial System and how multinational corporations operate.

Course Contents:

UNIT I: Introduction
Meaning and Scope of International Finance. The Emerging Challenges, Recent Changes in Global Finance Markets. Risk Management and Wealth Maximization. Foreign Exchange Exposure & Risk.

UNIT II: International Monetary System
Introduction, Exchange Rate Regimes, International Monetary Fund (MF), The Problem of Adjustment, The European Monetary System (EMS). Economic and Monetary Union (EMU).

UNIT III: Balance of Payment
Introduction , Accounting, Principles in BOP, Valuation and Timing, Components of BOP, Detail & Surplus in BOP, Exchange Rates, Interest Rates & Inflation Rates.

UNIT IV: Foreign Exchange Market
Structure , Mechanic of Currency Trading, Types of Transactions and Settlement Data , Exchange Rates , Quotation & Arbitrage , Pricing of short Data Broken Data Contracts Foreign Exchange Market in India .

UNIT V: Short Term & Long Term Borrowing
Short Term Borrowing: Introduction, Investment Pattern & Cash Management. Long Term Borrowing : Cost & Risk of Long Term Foreign Borrowing . Syndicated Loans, International Bonds, Risk and Return rom Foreign Equity Investment, Project Finance. Leasing, Hire Purchase and Factoring.

Outcome:
Global Exposure and Cross Cultural Understanding
This course demonstrates a global outlook with the ability to identify global businesses and cross cultural understanding. It will increase the knowledge of participants' imperative for long term financial decisions corresponding to global operations.

Suggested Readings:

1. Bhalla, V.K., International Financial Management, Anmol, New Delhi.
2. Shapiro, Alari C. Multinational Financial Management, PHI, New Delhi.
3. Abdullah, F.A. Financial Management for Multinational Firm, Englewood Fliffs, PHI.
4. G. Shailaja, International Finance, Universities Press.
5. V.S. Somnath, International Financial Management, I. K. International Pub. House Ltd.

The list of cases and specific references including recent articles will be announced in the class at the time of launching of the course.

DCE 303 C: HUMAN RESOURCE DEVELOPMENT

Course Credits: 04 **Max. Marks in Theory Paper: 60**

Objective:
The purpose of this course is to facilitate an understanding of the concepts, methods are strategies for HRD.

Course Contents:

UNIT I: Introduction
Fields of HRD-Concept, Goals, HRD department and its functions, HRD Climate and Practices in India. Staffing HRD Function, Developing HR Strategies and their execution in India.

UNIT II: Enriching Employees
Tanning & Development Needs, Designing and administration of Training & Development Programmes, Training effectiveness and its evaluation method, Importance of feedback to Trainee and Trainer. Performance Appraisal, Nature and Method of Appraisal, Potential Appraisal-Utilization and Implementation, Bench Making, Career Planning, Job Change, Career Management, New trends in Career Management, Counselling and Mentoring.

UNIT III: HR with Cross Culture
Human and Cultural variables in Global Organization, Cross Cultural differences and Managerial Implication, HRM factor in Global Organization – Leadership, Decision Making, Communication and Negotiation, Selection and Compensation Management. Emerging Trends in Global Business and consideration by HR-BPO, Off-shoring.

UNIT IV: Organisation for HRD
HRD System: Design & Administration of HRD Systems: HRD for workers: HRD Interventions, HRD Approaches for coping with Organizational Changes: Case Studies of HRD in Indian Organisations.

UNIT V: Human Resource Information System, Auditing & Accounting
HR Information System – Introduction, Job Information and families, Job competency. HR Audit, HR Report and research keeping mode, HR Accounting – Nature and Objective Models of HR Accounting and its prospects, Emerging Issues.

Outcome:
Business Environment and Domain Knowledge & Social Responsiveness and Ethics
This course creates an understanding of HR environment in which business operates and how economic, competitive and legislative factors affect staffing requirements. The course promotes understanding of various human and cultural variables in local and global organization. This will enable the graduates to adapt methods, techniques and strategies that are used to improve the productivity of human capital. They are expected to learn skills of planning, designing and administering various developmental activities aimed at up scaling the performance of the employees.

Suggested Readings:

1. Rao T.V., "Alternative approaches & Strategies of Human Resources Development", Rawat, Jaipur.
2. Pareek U., Managing Transitions the HRD Response, Tata Mc Graw Hill, New Delhi.
3. Dayal Ishwar, Successful Applications of HRD, New Concepts, New Delhi.
4. Tripathi PC, Personnel Management & IR.

The list of cases and specific references including recent articles will be announced in the class at the time of launching of the course.

GE 304: ENTREPRENEURSHIP

Course Credits: 04 **Max. Marks in Theory Paper: 60**

Objective:
The objective of this course is to acquaint the participants with the basic concepts of entrepreneurship and recent trends in start-up revolution in India.

Course Contents:

UNIT I: **Introduction**
Overview of Entrepreneurship and Qualities of a Good Entrepreneur. Managerial Skills required for Entrepreneurship. India's start up revolution-Trends, Imperatives, benefits; the players involved in the ecosystem, Business Incubators-Rural entrepreneurship, social entrepreneurship, Cases of large and small entrepreneurs of India. Success Stories of regional and local entrepreneurs.

UNIT II: Functional Management
Business Model Designing- Business Plan Designing-Financial Planning-Venture Valuation techniques-Financial management for entrepreneurs-Accounting principles-Management accounting for entrepreneurs. Entrepreneurial positioning, targeting, and segmenting, Prototype Development, Test Marketing & Commercial Launch. Pricing decisions and Sales & Distribution Management, HRM in Entrepreneurship: recruitment, selection, compensation, training and development.

UNIT III: Technology based Entrepreneurship
Technology overview-IPR protection for these technology industries-Patents, trademarks, designs, copyrights, and integrated circuit. Issues in the management of innovation and technology. Success stories of technology and App based entrepreneurs/start-ups in India.

UNIT IV: Non-profit & Social Ventures
Social Entrepreneurship; Addressing persistent social problems-Financing Social ventures, Venture Capital, Corporate Entrepreneurship and Micro Financing. Venture Valuation-Angel funds-Venture Capital-In-house corporate funding mechanism.

UNIT V: Women Entrepreneurship
Women Entrepreneurship in India- Categorisation of Women Entrepreneurs, Reasons for growth of Women Entrepreneurship, Problems faced by Women Entrepreneurs, Steps taken by the Government to develop women Entrepreneurs in India. Success stories of Women Entrepreneurs in India.

Outcome:
Developing Social Responsiveness and Leadership- This course will encourage the youngsters to respond to the requirements of the society and the economy by becoming job providers instead of job seekers. It will give them motivation and confidence to become business leaders.

Suggested Readings:

1. Peter Drucker: Innovation & Entrepreneurship.
2. Rashmi Bansal: Stay Hungry Stay Foolish
3. Shukla M.B: Entrepreneurship and Small Business Management.
4. H. S. Krishna, High-tech Internet Start-ups in India.
5. Susan Coleman & Dafna Kariv: Creating the Social Venture.
6. Priyanka Sharma Gurnani: Women Entrepreneurship: Emerging Dimensions of Entrepreneurship in India.

CC 305: INTERSHIP DISSERTATION & COMPREHENSIVE VIVA VOCE

Course Credits: 06 **Max. Marks: 100**

Objective:
The objective of this course is to give a practical exposure to the participants regarding the functioning of the business organisations by taking up a project during the tenure of the Internship and going through a practical problem of that organisation.

Course Contents:
The participants will be required to undergo a vocational training of 6-8 weeks in any business/commercial organisation of national/international repute. They will be required to have an orientation of the enterprise and/or identify one of the practical problems, study the variables through primary/secondary data, report the research findings & conclusion on the basis of data analysis and give certain suggestions for future.

The Dissertation submitted by the participants will be evaluated by at least one external and one internal examiner as per the rules. The candidate will have to make an oral presentation on his practical work with or without help of PPT and will appear in a Viva-voce conducted in the department/institute or on-line as decided by the university.

Outcome:
Critical Thinking, Business Analysis, Problem Solving and Innovative Solutions
The graduates are expected to develop skills on analysing the business data, application of relevant analysis and problem solving and reporting in functional area of management such as Marketing, Finance or Human Resource Management.

SEMESTER IV

CC 401: STRATEGIC MANAGEMENT

Course Credits: 03 **Max. Marks in Theory Paper: 60**

Objective:
The objective of this course is to impart an understanding of the comprehensive process of top management of a business enterprise so as to develop the ability to analyse business problems and provide an opportunity to experience the process of decision making.

Course Contents:

UNIT I: Introduction
Business Policy: Nature, Importance, Purpose & Objective. Concept of Strategy, Mission Policy, Purpose Objective, Goal & Tactics, Strategic Management an Overview.

UNIT II: Strategy Formulation
Environmental Appraisal: Mega, Micro & Relevant, Organisational Appraisal, SWOT Analysis, ETOP, OCP, & SAP Profiles, Environment Scanning & Sources of Information. VUCA Environment.

UNIT III: Strategic Alternative & Choice
Various Strategic Alternative, Grand Modernisation, Diversification, Integration, Merger, Takeover, Joint Venture, Turn Around, Divestment & Liquidation, Strategic Choice and Process.

UNIT IV: Strategic Implementation
Issues involved, Project & Procedural Implementation, Resources Allocation, Structural, Functional & Behavioural Implementation.

UNIT V: Strategic Evaluation & Control
An overview, nature and importance of Strategic Evaluation. Participant and Barriers in Strategic Evaluation. Requirements for Effective Evaluation. Operational Control; Premise Control, Implementation Control and Strategic Surveillance, Techniques of Strategic Control.

Outcome:
Domain Knowledge, Global Approach, Social Responsiveness and Ethics
The course gives a picture of how companies determine their long term goals and adapt course of action by appropriately allocating the resources. This will develop responsiveness to contextual social issues, problems and exploring solutions, understanding business ethics. The graduates will be able to analyze the business problems in a comprehensive way and strategize business decisions pertaining to problem across the apex level of management.

Suggested Readings:

1. Kazmi Azhar, Strategic Management, New Delhi, TMH.
2. Drucker P, Changing World of the Executive, New York.
3. Prahalad CK, Competing for Future. Boston, Harvard Business School Press.
4. John A. Pearce, Richard b. Robinson & Amita Mital: Strategic Management.
5. M. A. Carpenter, W. G. Sanders & Prashant Salwan: Strategic Management

The list of cases and specific references including recent articles will be announced in the class at the time of launching of the course.

CP 402: MANAGEMENT INFORMETION SYSTEM

Course Credits: 03 **Max. Marks in Theory Paper: 60**

Objective:
The objective of the course is to develop the basic understanding of the decision support system and importance of information system for business organizations.

Course Contents:

UNIT I: Introduction to MIS
Management Information System: Definitions: Basic Concepts & Frameworks- Major Trends in Technology, Applications of Information Technology, System & Design: System Development Initiative Different Methodologies – Life Cycle & Prototype approach, Role of MIS at various Managerial Levels, viz operational, planning and control.

UNIT II: Structure of MIS
Systems Approach to MIS, Operating Element of a MIS, MIS and Decision Making. MIS Structure on the basis of Management activity and organisastional functions, Synthesis of MIS structure evaluation.

UNIT III: Data Management & Information Handling.
Need of Information: Level of Information, Handling: Characteristics of Information at various control levels, advantage of computerization; Data flow diagram, Data dictionary, Data Base management and Word Processing; Electronic Spreadsheet and its managerial application.

UNIT IV: Decision Support System (DSS)
Characteristics, Structure and Classes of DSS, DSS as an aid to Decision Making, Support for intelligence, Design and choice, Decision trees, Approaches to development of DSS.

UNIT V: Managerial Application of Computers
Use of Computers in Management functions, viz Finance, Marketing and Operations etc. Computer based Financial System: Financial Analysis and Planning, Financial Management Software. Computer based Inventory system: computerized Inventory Management, Inventory system Design. Computer based HRM: System design, Data requirement and use of computers in HRM.

Outcome:
Critical Thinking, Business Analysis, Problem Solving and Effective Communication
Understanding the Information systems used at different levels for processing large amount of data will promote problem solving capacity, critical thinking and analytical skills and thereby innovative solutions to the problem of bulk data processing will be generated. The graduates are expected to make the best use of computer technology in handling the information at different levels of management to take decisions. Competency in MIS will help graduates to ensure better communication and connectivity throughout the organization across all levels of management.

Suggested Readings:

1. David Olson : Management Information System
2. Mudrick, Ross : Information Systems for Modern Management
3. Andrew P : Decision Support System Engineering, Sage
4. Hitesh Gupta : Management Information System
5. D. P. Goyal : Management Information System: Managerial Perspectives.

The list of cases and specific references including recent articles will be announced in the class at the time of launching of the course.

DCE 403 A: INTEGRATED MARKETING COMMUNICATIONS

Course Credits: 04 **Max. Marks in Theory Paper: 60**

Objective:
The aim of the course is to acquaint the students with concept and techniques of promoting product, services and ideas and developing an effective marketing communication strategy and its execution.

Course Contents:

UNIT I: Introduction
Process of Marketing Communication, Enhancing Brand Equity through Integrated Marketing Communication (IMC). Corporate Communication, Communication Mix, Role of Advertising & Promotions in Segmentation, Targeting & Positioning. Stimulating of Primary & Selective Demand, DAGMAR approach.

UNIT II: Advertising as a Communication
Definition, Objectives, Functions and Classification of Advertising. Advertising vs other forms of Mass Communication, Determination of Target Audience: Building of Advertising Programme-Message, Headlines, Copy, Logo, Illustration, Appeal, Layout: Campaign Planning: Copy Testing: Pre Test &Post Test, Ad Effectiveness. Ethics and Truth in Advertising.

UNIT III: Advertising Media & Ad Agency
General and Special Characteristics of different Advertising Media. Media Planning and Media Strategy, Media Tactics: Media Class, Vehicle, Option and Timing Decision, Media Buying. Traditional vs Modern Media: Online & Mobile Advertising, Social Media for Advertising & Promotion. Function of a modern agency, functions of the advertising department and advertising manager, Advertising Budget-Approaches and Procedures for determining the size of the budgets, characters of items to be charged to advertising.

UNIT IV: Digital & Social Media Marketing
Evolution of Digital Marketing, Digital Marketing Landscape, Search Engine Marketing, Social Media Marketing: Strategy & Customer Engagement, Affiliate Marketing & Strategic Partnerships, E-mail Marketing and Content Strategies. Data Analytics: Web Analytics, Social Listening & Social Media Analytics. Integrating Digital & Social Media Strategies.

UNIT V: Sales Promotion
Consumer Oriented Sales Promotion and Trade Oriented Sales Promotion. Samples, Coupons, Deals, Premiums and other emerging tools of Sales Promotion, Trade Oriented Sales Promotion, Contests, Discounts & Allowances. Integrating Sales Promotion with Integrative Marketing Communication Strategies. Word of Mouth Influence & Sponsorships, POP Communication & Signage.

Outcome:
Business Environment and Domain Knowledge
The graduates will be able to learn various advertising and promotional tools and their importance in attracting the customers. This will also hone their creativity, analytical and communication skills which they are expected to display in developing and managing effective product promotion with the use of appropriate media.

Suggested Readings:

1. Aaker David: Advertising Management, PHI, New Delhi.
2. Ogilvy, David Lgilvy on Advertising London, Lonfman.
3. Mohan M : Advertising Management, TMH.
4. Rana, Slade, Sahu, Kizgin, Singh, Dey, Gutierrez & Dwivedi : Digital & Social Media Marketing, Springer
5. K. E. Clow & D. E. Baack: Integrated Advertising, Promotion and Marketing Communication, Pearson.

The list of cases and specific references including recent articles will be announced in the class at the time of launching of the course.

DCE 403 B: PROJECT APPRAISAL & FINANCE

Course Credits: 04 **Max. Marks in Theory Paper: 60**

Objective:
The basic purpose of this course is to understand the framework for evaluating Capital expenditure Proposals, their planning & management in the review of the projects undertaken.

Coarse Contents:

UNIT I: Introduction
Generation and Screening of Project Idea; Capital Expenditure; Importance & Difficulties, Project Negotiation.

UNIT II: Project Analysis
Market demand & situational analysis; technical analysis; Managing of project risk & market risk; social cost benefit analysis.

UNIT III: Project Management
Multiple Projects & constraints; Network Techniques for Project Management: Project Review & Administrative Aspects.

UNIT IV: Project Financing
Overview and structuring of Project Financing. Project Financing in India; Problem of time & cost overrun in Public Sector Enterprises in India.

UNIT V: Project Appraisal
Assessment of tax burden of various projects, making comparative analysis; Environmental appraisal of projects-Financial & Technical Environment.

Outcome:
Critical Thinking, Business Analysis, Problem Solving and Innovative Solutions
The participants will acquire skills for setting goals within a realistic budget and time. They are expected to play a lead role in planning, executing, monitoring and controlling the projects by ensuring their completion in due time and within budget.

Suggested Readings:

1. Chandra, Prasanna, Projects: Preparation, Appraisal, Budgeting & Implementation.
2. Ahuja, G.K & Gupta, Ravi, Systematic Approach to Income Tax Allahabad Bharat Law House.
3. Bhalla V.K. Modern Working Capital Management, New Delhi, Anmol.
4. Bhalla V.K., Financial Management & Policy II Ed. New Delhi Anmol.
5. Dhankar, Raj S. Financial Management of Public Sector Undertaking, New Delhi, West Ville.

The list of cases and specific references including recent articles will be announced in the class at the time of launching of the course.

DCE 403 C: COMPENSATION & BENEFITS MANAGEMENT

Course Credits: 04 **Max. Marks in Theory Paper: 60**

Objective:
The course is designed to promote understanding of issues related to the compensation or rewarding Human Resources in the corporate sector, public services and other forms of organizations and to impart skills in designing, analyzing and restructuring reward management system, policies and strategies.

Course Contents:

UNIT I: Compensation Theories & Practices
The market forces of Demand and Supply: The concept of demand and Supply of Labour, Effectiveness of the forces of Demand and Supply, Competitive Imperatives; Perfect and Imperfect competition, Conceptual and Theoretical Understanding of Economic Theory related to the Reward Management: classical, non-classical and modern theory, Demand and supply theory, competitive theory, Productivity, Bench Marking.

UNIT II: Compensation Methods
Determination of Inter and Intra-Industry Compensation Differentials, Internal and External Equity in Compensation Systems; Understanding Tools Used in Designing, Improving and Implementing Compensation Packages.

UNIT III: Compensation Packages
Compensation Design for Specific Type of Human Resources like Compensation of Chief Executives Senior Managers, R&D Staff etc. Understanding Different Components of Compensation Packages like Fringe Benefits, Incentives and Retirement Plans.

UNIT IV: Code on Wage 2019
Preliminary, Minimum Wages, Payment of Wages, Payment of Bonus, Advisory Board, Payment of Dues, Claims & Audit, Inspector cum Facilitator, Offences & Penalties.

UNIT V: Code on Social Security 2020
Preliminary, Social Security Organisations, Employee Provident Fund, Employee State Insurance Corporation, Gratuity, Maternity Benefit, Employee Compensation, Social Security & Cess in Respect of Building & Other Construction Workers, Social Security for Unorganised Workers, Finance & Accounts, Authorities, Assessments, Compliance & Recovery, Offences & Penalties, Employment Information & Monitoring.

Outcome:
Domain Knowledge, Critical Thinking and Problem Solving
This course offers understanding of various external factors affecting the administration of wage and salary**.** The graduates will be acquainted with appropriate ways to analyze and determine the salary, incentives and benefits that employees receive in the organization. This will improve their critical thinking & problem solving skills. They are expected to design and offer fair and attractive pay packages and benefits to the employees in compliance with relevant legislations and paying capacity of the organization when they find the decisional role in the organisation.

Suggested Readings:

1. Srivastava S.C. Industrial Relations and Labour Laws. New Delhi. Vikas.
2. Malhotra OP, The Law of Industrial Disputes. Vol. I & II Bombay.
3. Seth DD, Industrial Disputes Act 1947, Vol. I & II Bombay.
4. The Gazette of India (Extraordinary 8 Aug 2019, 29 Sept 2019)

The list of cases and specific references including recent articles will be announced in the class at the time of launching of the courses.

404 A: INTERNATIONAL MARKETING

Course Credits: 04 **Max. Marks in Theory Paper: 60**

Objective:
The basic objective of this course is to acquaint the students with environmental, procedural, institutional and decisional aspects of international marketing.

Course Contents:

UNIT I: Introduction
International Marketing-Definition, Concept and Setting, Distinctions between International Trade, International Marketing and International Business: Economic Environment of International Marketing, International Institutions-World Bank, IMF, UNCTAD, WTO.

UNIT II: Trade Barriers & Blocks
Fiscal and Non-fiscal Barrier, Non-tariff Barriers, Trading Partners - Bilateral Trade Agreements, Commodity Agreements, Customs Union, Common Markets, Free Trade Zones, Economic Communities.

UNIT III: Export Management
India and World Trade, Import and Export Policy, Direction and Quantum of India's Exports; Institutional Infrastructure for Exports Promotion, Export Promotion Councils, Public Sector Trading Agencies, ECGC.

UNIT IV: Export Procedures and Documentation
Procedure and Documents – Registration of Exporters, Export Quotations, Production and Clearance of Goods for Exports, Shipping and Transportation, Insurance, Negotiation of Documents. Instruments of Payments-Open Account, Bills of Exchange: Letter of Credit, Export Finance.

UNIT V: International Marketing Mix
International Marketing Mix- Identification of Markets. Product Policy, International Product Life Cycle, Promotion Strategy, Pricing Strategy and Distribution Strategy.

Outcome:
Business Environment and Domain Knowledge and Global Exposure and Cross Cultural Understanding
This course will improve the awareness on various factors affecting the international business environment. The graduates of this course will be able to learn concepts of marketing in a global perspective which will enable them to identify, explore opportunities in the field. This course demonstrates a global outlook with the ability to identify global businesses and cross cultural understanding.

Suggested Readings:

1. Justin Paul & Rumneek Kapur, International Marketing, TMH, New Delhi.
2. Philip R. Cateora & John L. Graham, International Marketing, Erwin McGraw Hill.
3. Bhattacharya, Export Marketing: Strategies for Success, Global Business Press, New Delhi.
4. Rathore BS: Export Marketing
5. Varshney & Bhattacharya: International Marketing

The list of cases and specific references including recent articles will be announced in the class at the time of launching of the course.

DCE 404 B: TAXATION

Course Credits: 04 **Max. Marks in Theory Paper: 60**

Objective:
The objective of this course is to acquaint the participant with the implication of tax structure and corporate profit planning in operational as well as strategic term.

Course Contents:

UNIT I: Income Tax
Basic Concepts of Income Tax, Filing of Returns, Self Assessment of Tax, Tax Deduction at Source (TDS), Tax Rebates and Relief, Computation of Tax Liability.

UNIT II: GST
Provisions & Slabs, GST Network, GST Service Providers, GST: Assessment, Audit and Appeals. Electronic Way Bills and GST Return.

UNIT III: Corporate Taxation
Residential Status of a Company. Computation of Income under different heads of income, Set off and carry Forward of losses. Tax Planning and Location of undertaking, Types of activity, Ownership Pattern, Tax planning regarding Dividends Policy, Issue of Bonus Shares, Inter operate Dividends and Translate, Tax Planning Relating to Amalgamation and Merger of Companies.

UNIT IV: Tax Considerations in Respect of specific management decision
Tax considerations in respect of specific managerial decision like Make or Buy, Own or lease, Close or Continue Sale in Domestic Market or Exports. Replacement and Capital Budgeting decisions etc.

UNIT V: Taxing and Strategic Alliances
Tax Planning in respect of managerial remuneration, Foreign collaboration and joint ventures, implications of avoidance of double Taxation agreements.

Outcome:
Domain Knowledge, Critical thinking, Business Analysis and Problem Solving
This course will improve the awareness of graduates on local and global business environment related to taxation and the associated factors that affect the tax planning decisions. The graduates will elicit knowledge about tax structures and tax planning. It also promotes critical thinking, analytical thinking and problem solving.

Suggested Readings:

1. B. Balachandran & S. Thothadri, Taxation Law & Practice, PHI.
2. Ram Dutt Sharma, Taxes in India, Commercial Law Publishers India Pvt. Ltd.
3. Ahuja, GK & Gupta, Ravi Systematic Approach to Income Tax, Allahabad, Bharat Law House.
4. Singhania, VK Direct Taxes: Law and Practices, Delhi, Taxman.
5. Shrinivas, EA, Handbook of Corporate Tax Planning, New Delhi, TMH.

DCE 404 C: ORGANISATIONAL CHANGES AND DEVELOPMENT

Course Credits: 04 **Max. Marks in Theory Paper: 60**

Objective:
The objective of this course is to prepare students as organizational change facilitator using knowledge and techniques of behavioural science.

Course Contents:

UNIT I: Introduction
Organization Change- An overview, Approaches to Problem Diagnosis, some major technique of Planned Change, Steps in OD, general OD Competencies, OD skills.

UNIT II: O.D. Intervention-I
An overview of OD Intervention, Classification of OD, Team Interventions, Inter-Group and the Party Peace Making Interventions. Training Experiences; Behaviour Modelling and Life.

UNIT III: O.D. Intervention-II
Comprehensive Intervention; Confrontation Meeting, Survey Feedback, Strategic Management Activities and Grid OD, Structure Interventions- Job Design, Job Enrichment, MBO, Quality Circle, QWL, TQM, Parallel Learning Structure.

UNIT IV: Key Consideration & Issue in OD
Issue in Consultant- Client Relationship, Power and Politics in OD, System Ramification, Resistance to Change, leadership and Labour Relations.

UNIT V: Research on OD
Assessing effect of OD, Recent Development in research on OD, Future of OD, Condition for optimal success of OD.

Outcome:
Domain Knowledge and Social Responsiveness
Gaining understanding of organisational changes will allow the graduates to learn new skills, explore new opportunities and exercise creativity in ways that ultimately benefit the organization. The graduates will elicit knowledge about different types of change and ways to manage that change in the organization. They are expected to develop responsiveness towards the change by exploring the opportunities and strategizing decisions in the favour of organization.

Suggested Readings:

1. French, Bell & Vohra : Organizational Development, PHI.
2. Deepak Kumar Bhattacharya : Organisational Change & Development
3. Bennies WG : Organizational Development
4. Pareek U : Managing Organization Change.
5. Kumkum Mukherjee : Organisational Change & Development

The list of cases and specific references including recent articles will be announced in the class at the time of launching of the courses.

405: MANAGING BANKS & FINANCIAL INSTITUTIONS

Course Credits: 04 **Max. Marks in Theory Paper: 60**

Objective:

The objective of this course is to acquaint the participants with overview of products & services and recent trends in operations & working system of banks and financial institutions.

Course Structure:

Unit I: Introduction

Introduction to Banking and Finance: Banking Regulation Act, Principles of Banking, Financial System and Economic Development, Flow of Funds in Indian Economy, Difference between Financial Market and Product Market.

Unit II: Short Term and Long term Financial Market

Financial Markets: An Overview, Call Money Market, Treasury Bills Market, REPO Market, CBLO Market, Commercial Paper Market, Market for Certificate of Deposits, Bankers' Acceptance, Pricing Money Market Instruments, Bond Market, Equity Stock Market and Private Equity Market.

Unit III: Functioning of Banks and Financial Institutions

SEBI and its Regulation, Financial Market & Institution, Depository Institution, Know Your Customer (KYC) Norms, Guidelines, Documentation, Verification and Transaction Monitoring. Commercial Banks, Industrial finance & Term Lending, Bank Credit and Mortgages Market. NPA-norms and management; Documentation-types of documents, documentation procedures, stamping of documents.

Unit IV: Technology in Banking

Information Technology in finance and service delivery; Impact of Technology on Banks; Protecting the confidentiality and secrecy of customer data; Banking software-ALPM, Total Bank Mechanisation, Core Banking System, Internet Banking, Anywhere Banking, Electronic Funds Transfer, NEFT, RTGS, SWIFT.

Unit V: Investment Services

Mutual Funds: Types and its Performance Measurement, Chit funds Organization, Life, General and Health Insurance. Pension Funds, Factoring and Forfeiting.

Outcome:

Domain Knowledge & Value Addition

This course will improve the awareness of graduates on banking system and working of financial institutions. It will be value addition to their knowledge as this sector is full of employment opportunity for the fresher's. This course will make them industry ready for placement in Banks & Financial Institutions.

Suggested Readings:

1. Practice of Banking Advances by Bedi and Hardikar
2. Law and Practice of Banking by P. N. Varshney and Gopal Swaroop
3. Banking- Theory, Law and Practice by Gordon & Natarajan
4. Banks and Institutional Management by Vasant Desai
5. Fundamentals of Life Insurance by Kaninika Mishra, PHI.
6. Fundamentals of Investments by Vanita Tripathi

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MBA HUMAN RESOURCE DEVELOPMENT

FULL TIME FOUR SEMESTER PROGRAMME

CHOICE BASED CREDIT SYSTEM (CBCS)

SYLLABUS

(SESSION 2020-21 ONWARDS)

STUDY CENTRE FOR MBA (HRD)
LIFE LONG LEARNING DEPARTMENT
A.P.S. UNIVERSITY, REWA (M.P.)

MBA (HRD) PROGRAMME

MASTER OF BUSINESS ADMINISTRATION

HUMAN RESOURCE DEVELOPMENT

FULL TIME FOUR SEMESTER PROGRAMME

CHOICE BASED CREDIT SYSTEM (CBCS)

AS PER ORDINANCE 14, APPROVED BY CO-ORDINATION COMMITTEE

PROSPECTUS

PROGRAMME STRUCTURE, SYLLABUS & SCHEME

(SESSION 2020-21 ONWARDS)

DEPARTMENT OF LIFE LONG LEARNING

AWADHESH PRATAP SINGH UNIVERSITY,

REWA (M.P.)

MBA (HRD) PROGRAMME

MASTER OF BUSINESS ADMINISTRATION

HUMAN RESOURCE DEVELOPMENT

FULL TIME FOUR SEMESTER PROGRAMME

CHOICE BASED CREDIT SYSTEM (CBCS)

AS PER ORDINANCE 14, APPROVED BY CO-ORDINATION COMMITTEE

Programme Objectives:-

The MBA (HRD) Programme Structure is divided into four semesters, two years full time regular study programme run by the deptt. The courses are classified as Core Courses, Discipline Centric Electives and Generic Elective Courses. The programme structure has been designed systematically and divided into four semesters. Semester I has Core Courses focusing on Management Concepts, Business Environment, Quantitative Method , Managerial Economics, Environmental Management, Computer Application have been included to develop multi-disciplinary foundation and Human Resource Development is a Generic Elective Subject in curriculum and next is Comprehensive viva-voce in CC.

II Semesters introduces the student to the different functional areas of Human Resource, Business Environment, Functional Management, Organizational change and intervention strategies, Organizational Behaviour core subject and Quality of work life and Total Quality Management is Generic Elective Subject and Comprehensive Viva-voce in Core Courses.

In III Semesters students opt following papers as Human Resource Planning, MIS, Compensation Management in Core courses and Management Training and development, Management of comparative industrial relation in Discipline Centric Elective courses.Counselling skills for managers is generic elective and next is summer training in course curriculum.

In IV Semesters student offers Discipline Centric Elective Courses on HRD in specialized sector and Entrepreneurship. Business policy and strategic management, Business Legislation, Cross cultural and global Human Resource Management, and Industrial psychology with Comprehensive Viva-voce in Core Courses.

Summer Training Project Report:-

A candidate has to undergo a field Summer Training/Industrial Training to Industrial Organisation for Four to Six week and submit a project report in semester III of the course. Summer Training Project Report topic is decided by the Deptt. and concerned organisation.

SEMESTER-I

Course Code & Name	Course Type	Theory Paper	Internal Assessment	Maximum Marks	Credits
101 Management Concepts & Practices	CC	60	40	100	4
102 Quantitative Methods	CC	60	40	100	3
103 Managerial Economics	CC	60	40	100	4
104 Environmental Management	CC	60	40	100	3
105 Computer Application	CC	60	40	100	3
106 Managerial Skill Development	CC	60	40	100	3
107 HRD : Strategies and System*	GE	60	40	100	4
108 Comperhansive Viva-Voce	CC			100	4
SEMESTER TOTAL				**900**	**28**

SEMESTER-II

Course Code & Name	Course Type	Theory Paper	Internal Assessment	Maximum Marks	Credits
201 Legal Framework Governing Human Relation	CC	60	40	100	4
202 Human Resource Management	CC	60	40	100	3
203 Business Environment	CC	60	40	100	4
204 Function Management	CC	60	40	100	3
205 Organizational Change and Intervention Strategies.	CC	60	40	100	3
206 Organizational Behavior	CC	60	40	100	3
207 Quality of Work Life and Total Quality Management*	GE	60	40	100	4
208 Comprehensive Viva-Voce	CC			100	4
SEMESTER TOTAL				**900**	**28**

SEMESTER-III

Course Code & Name	Course Type	Theory Paper	Internal Assessment	Maximum Marks	Credits
301 Human Resource Planning	CC	60	40	100	4
302 Management Information System and Decision Support System	CC	60	40	100	4
303 Compensation Management	CC	60	40	100	4
304(A) Management Training and Development *	DCE	60	40	100	4
304(B) Management of Comparative Industrial Relation *	DCE	60	40	100	
305 Counselling Skills for Managers*	GE	60	40	100	4
306 Summer Training Report and Viva-Voce	CC			100	8
SEMESTER TOTAL				**700**	**28**

SEMESTER-IV

Course Code & Name	Course Type	Theory Paper	Internal Assessment	Maximum Marks	Credits
401 Business Policy and Strategic Management	CC	60	40	100	4
402 Business Legislation	CC	60	40	100	4
403 Cross Cultural and Global Human Resource Management	CC	60	40	100	4
404 (A) Industrial Psychology	DCE	60	40	100	4
404 (B) HRD in specialized sector	DCE	60	40	100	4
405 Entrepreneurship	CC	60	40	100	4
406 Summer Training Report and Viva-voce	CC			100	4
SEMESTER TOTAL				**700**	**28**

CC: Core Course **GE: Generic Elective** **DCE: Discipline Centric Elective**

COURSE STRUCTURE

MBA (HRD) First Semester 2020-21 and in onward.

CC 101	Management Concept and Process.
CC 102	Quantitative Methods.
CC 103	Managerial Economics
CC 104	Environment Management
CC 105	Computer Application
CC 106	Managerial Skill Development
GE 107	HRD: Strategies and System.
108	Comprehensive Viva-Voce

MBA (HRD) Second Semester 2020-21 and in onward.

CC 201	Legal Framework Governing Human Relation.
CC 202	Human Resource Management.
CC 203	Business Environment
CC 204	Function Management
CC 205	Organizational Change and Intervention Strategies.
CC 206	Organizational Behavior
GE 207	Quality of Work life and Total Quality Management

208 Comprehensive Viva-Voce

MBA (HRD) Third Semester 2020-21 and in onward.

CC 301 Human Resource Planning

CC 302 Management Information System and Decision Support System

CC 303 Compensation Management

DCE 304 (A) Management Training and Development *

DCE 304 (B) Management of Comparative Industrial Relation *

GE 305 Counselling Skills for Managers*

306 Comprehensive Viva-Voce

MBA (HRD) Fourth Semester 2020-21 and in onward.

CC 401 Business Policy and Strategic Management

CC 402 Business Legislation

CC 403 Cross Cultural and Global Human Resource Management

DCE 404 (A) Industrial Psychology

DCE 404 (B) HRD in specialized sector

GE 405 Entrepreneurship

406 Comprehensive Viva-Voce

Syllabus

CC -101- MANAGEMENT CONCEPTS AND PROCESS

Objectives:

The aim of this paper is to develop the basic management skills among the disciplines,to make their foundation, as manager.

Course Contents: -

UNIT-1:

Introduction-Concept the Significance of Management, Principles of management Classical School. Neo Classical School and Modem School of Management.

UNIT -II:

Planning-Significance, Process and Types. Forecasting, Techniques, Objectives- Meaning and importance MBO (Management by Objective). Decision Making, Significance. Types and Process.

UNIT-III:

Organising-Concept and process of Organising. Organizational Structures. Departmentations-Needs and considerations. Authority, Power and Responsibility. Delegation of Authority, Span of Management.

UNIT - IV:

Directing-Direction -Meaning & Principles. Leadership-Style & Theories. Motivation-Meaning & Theories.

UNIT - V:

Controlling and Co-ordination- Controlling- Meaning and Process. Pre-requisites of an effective control. Co-ordination-Meaning, Importance and Principles.

Suggested Readings

(1). V.S.P. Rao : Management Text & Cases - Excel Books New Delhi.
(2) L.M. Prasad : Principles and practice of management
(3) J.K. Jain : Principles of management
(4)Peter Drucker: Principles of management
(5) Terry &Franklin : Principles of management
(6) Tripathi &Reddi: Principles of management
(7) Stoner &Freeman : Principles of management

CC-102. QUANTITATIVE METHODS

Objectives:

The aim of this paper is to develop the basic quantitative methods among the disciplines so as to make their foundation.

UNIT I :

Matrices and Determinants: Definition, notation, types of matrices, operations on matrices, transpose of a matrix ,symmetric and skew symmetric matrices, elementary transformation of a matrix, Invertible Matriees, Determinants, minores, properties of determinants, minores, coftactors, Ad joint and inverse of a matrix.

UNIT II:

Introduction of Statistics: Meaning, scope, advantages and Definitions of statistics, statistical methods and limitations of statistical methods. collection of dada primary data and secondary data, Interview and Questionnaire, Frequency distribution, Data presentation, Bar charts Histogram, frequency polygon and frequency arue, pie diagram.

UNIT III :

Measures of central tendency and Measures of Dispersion: Arithmetic mean, Geometric Mean, Harmonic mean, Medias Quartiles, mode, Measures of Dispersion, Range, interquartile range, mean deviations, root mean square deviation standard Deviation.

UNIT IV :

Probability, Method of least Square, correlation, Regression, and Index number: Explanation of important terms of probability, Definitions of probability, addition law and multiplication law of probability problems, based on them. Correlation and Regression: Introduction, Positive and negative correlation, Karl Pearson's coefficient of correlative Regression, Two lines of regression, Properties of Regression coefficients.Index Number: Price Index Number Laspeyre's, Pasche's and Fisher's methods of construction of price index Number.

UNIT-V

Theory of Testing of Hypothesis. Sampling (Large Samples and small samples). Concept of Population and sample, Types of sampling objective of sampling. Parameters and statistic, Null Hypothesis and Alternative Hypothesis, Tests of Significance, Level of significance, Test of Significance of large samples, Test of significance based on x (chi square), Test of independence of attributes, condition for the applicationof x. Tests of significance based on t, F and Z.

Suggested Readings :

1. A R. Vaslishtha Matrices, Krishna Prakashan Mandir Meerat.
2. R.S. Bharadwaj: Bussiness statistics, Excel Books, New Delhi
3. Ray and Sharma: Mathematical statistics, Ram prasad & Sons
4. D.N. Elhaner : Elements of statistion.
5. J.N. Kapur and H.C. Saxena :Schand and company. Ram Nagar New Delhi, 110055.

CC-103. MANAGERIAL ECONOMICS

Objectives:

The aim of this paper is to develop basic concepts of Economics among the disciplines so as to make their foundation, as a manager.

Unit I:

Introduction of managerial economics- meaning,definition, concept nature and scope of managerial economics, Relations of managerial economics with other discipline, role of managerial economist

Unit II:

Concept of demand and supply – Meaning of demand, the basis of consumer demand. The meaning of Utility, total utility, marginal utility, law of diminishing marginal utility, law of demand. Meaning and concept of market demand. Demand force casting, concept of supply, determination of price , complex changes in demand and supply.

Unit III:

Cost Analysis-meaning and concept of cost. The theory of cost,cost output function, cost in the short run, costsin the long run, application of cost analysis, forms of cost function, relevance of cost theory for managers.

Unit IV:

Market structure and pricing decisions- Introduction market and criteria for market classification, various forms of market structure price determination, price under perfect competition, characteristics of perfect competition, time elements in the theory of price.

Unit V:

National Income and Economic Growth- Concept and measurement Definition and concept of national income, measures of National Income and income- Gross natural product(GNP) Gross domestic product (GDP), Net natural product,(NNP), Measurement of national income in India-meaning of economic growth ,Determinates of economic growth, Human Resource , natural Resource, Capital formation technology .

Suggested Readings:

1. Adhikari, M: Business Economics, New Delhi Ench. Book, 2000.
2. Chopra, O.P.: Managerial Eco. Delhi, Tata McGraw Hill. 1985.
3. Atmanand : Managerial Economics Excel Books New Delhi.
4. P.L. Metha, Managerial Eco. New Delhi, Sultan Chand & Sons, 1995.

CC - 104 ENVIRONMENTAL MANAGEMENT

Objectives:

The aim of this paper is to make the students acquaint with various aspects of EnvironmentalManagement.

Course Contents:

Unit-l :

Environmental Management – Environmental Science: An inter disciplinary science, Global Environmental Problems. Sitting guidelines for industries. Energy Management: Conventional Fuels. Non-Conventional Energy, Biological Energy, and Solar Energy.

Unit-ll:

Ecosystem –Ecosystem: Basic concept and their application in business.

Unit –lll:

Environmental Management System – Environmental protection standards in the India, Environmental quality monitoring ISO 14000 and impact on developing countries, Environmental auditing. Environmentalethics.

Unit –IV:

Brief Study of Environmental Management-Brief Introduction to Environmental Laws,Environment and Greenhouse effect.

Unit-V:

Pollution and Management –Air , Water , Land , Pollution , Forest and BiodiversityManagement, Water resources .

Suggested Readings :

1. K.C. Agrawal : Environmental Biology
2. K.C. Agrawal : Environmental Pollution & Law
3. G.N. Pandey & G.C. Pandey: Environmental Engineering
4. R.K. Trivede : Introduction to Air Pollution
5. N.K. Uberai: Environmental Management Excel Books New Delhi

CC - 105 COMPLUTER APPLICATIONS IN MANAGEMENT

Objectives:

The aim of this paper is to acquaint the students with the usage of computer in data processing lo as to aid the budding managers in effective decision making.

Course Contents:

Unit-1:

Introduction- History, Characteristics, Classification & Types of Computer. Computer Generations. Components of Computers-Input, CPU& Output Units.

Unit-Il:

More About Computer-Input & Output Devices, primary &Secondary Storage Devices, Computer Software & its type, Computer Language & their Classification

Unit-III:

Flowcharts & DOS- Flowcharts Meaning, Advantages and Preparation of simple flowcharts Operating Systems Need U Meaning. Introduction to MS-DOS & Simple Internal & External Command.

Unit-IV:

Windows - Introduction Windows - Components & Windows Screen Feature of Window - Program Manager & Application File Manager & Application. Print Manager & Application, Accessories Control Panel.

Unit-V:

MS-Office - Introduction to MS-Office & Office Tools Introduction to word processor with MS word Components of MS word Screen. Loading. Creating Documents. Copying,Formatting. Printing Documents, Printing Tables, Storing &Mail merge

Suggested Readings:

1. Sinha P.K.: Computer Fundamental
2. Rajaraman V.: Fundamental of Computer
3. Taxali: Windows
4. Taxali: P.C. Software Made Easy

CC-106 MANAGERIAL SKILS DEVELOPMENT

Objectives:

The course aim at helping the students to develop skills in personal, notational and written communication so as to express the east clearly and effectively.

Course Contents

Unit-I:

Business Communication Meaning, definition, objectives scope and importance. Different Media and Modes of Communication Principles of Communication, Effectiveness of Communication inManagement

Unit-ll:

Process & Elements of Communication Types and Patterns of Communication network, Barriers Communication.

Unit-III:

Oral Communication Skills Committee, Group Discussion, Negotiation, Role Playing, Seminar, Principles of Public Speaking

Unit-IV:

Written Communication Memos. Circulars, Different types of Business letters Application, Enquiry, Response Letters, Do's and Don'ts of Business Writing Preparation of curriculum vitae

Unit-V:

Report Writing, Meetings- Notice and Agenda, Minutes Writing, drafting of representations

Suggested Readings:

1. Rai &Rai : Business Communications
2. DS. Bhende : Business Communications
3. Rogers & Shoemakers Communication and Innovation
4. David Borio The Process of Communication
5. ParagDiwan Business Communication Excel Books New Delhi.
6. Murphy Effective Business Communication

GE-107-HRD: STRATEGIES & SYSTEM

Objectives:

The aim of this paper is to develop an understanding among the students regarding development of Human Resources & executing the decision effectively.

Course Contents:

Unit-1:

Introduction – meaning, definition, concept need and objective of HRD , HRD as a total system characterizes of HRD, functions of HRD, Emerging trends of HRD , Line managers and HRD

Unit II :

HRD system –process of designing HRD system ,HRD system , HRD system and sub system its process and outcomes , HRD culture and climate , factors effecting in HRD system , HRD OD-IR linkage

Unit-III:

Planning for HRD – Meaning and concept of career planning objective and nature of career planning, Process of career planning functions and significance of career planning , succession planning meaning , concept and scope of succession planning significance of succession planning .

Unit-IV:

Development supervision – training meaning definition caret and needs of training types of training performance & potential appraisal, feedback, counseling coaching & mentoring

Unit – V:

HRD department – principals of designing HRD system organization for HRD, Providing physical and financial resources and facilities.

Suggested Readings:

1. Leonard Nadler : Corporate HR's
2. T.V. Rao : Reading in HRD
3. Udai Pareek & T.V. Rao : Designing and managing HR System
4. T.V. Rao : HARD Missionary
5. V.R.K. Reddy : Strategic approach to HRD
6. P.C. Tripathi : Human Resource Development
7. P.N. Singh : Developing & Managing LR

108 Comprehensive Viva-Voce

201. LEGAL FRAME ORK GOVERNING HUMAN RELATIONS

Objectives :

The objective of this paper is to acquaint the students with the various laws governing the manpower in the organization. The scope will be limited to objectives, definitions important provisions of the acts and administration

Course Contents:

Unit-l: Emergence and Objectives of Labour Laws and their socioeconomic environment. Employee's Compensation Act 1923 object & scope and definitions, employer's liability compensation for compensation amount of compensation.

Unit-II : Payment of Bonus Act 1965- Object, scope and definitions. Calculation of bonus set on set off deductions permissible from Bonus, Payment of Gratuity Act 1972. Objectives, scope Calculation of gratuity and mode of payment Maternity benefit Act 1961- Object, scope, and definitionsMaternity benefits.

Unit-III : Industrial Dispute Act 1947- Definitions, object, scope, authorities, concept of strike, lockout, layoff, retrenchment, prevention andsettlement of dispute. The Industrial Employment (Standing orders) Act 1946- Object, scope, definitions, procedure for submission and certification of Draft standing orders, other provisions relating to standing orders, powers, and duties of certifying officers

Unit-IV: Employees State Insurance Act 1948 Object. scope administration ofthe scheme, benefits under ESI Scheme, Offence and penalties Employees provident fund and Miscellaneous Provision Act, 1952 Object, scope, employees provident fund scheme.

Unit-V: Factories Act 1948- Definitions, object, scope, provisions of healthsafety, welfare, working hours and employment of women and youngperson

Suggested Readings:

1. Mainotra, O.P.: The law of industrial disputers, Vol and IIT, Bombay, N.M. Tripathi, 1985
2. Mall, PL Handbook of Industrial Law, Lucknow Eastern Book, 1995
3. Srivastava, S.C : Industrial Relations and Labour Law, New Delhi
4. Gharye, B.R. Law & Procedure of Departmental Enquiry in Private & Public Sector, Lucknow, Eastem
5. Lal BD Singh Labour Laws for Managers - Excel Books New Delhi

202. HUMANRESOURCE MANAGEMENT

Objectives :

The aim of this paper is to acquaint the students with the various aspects management as applied to handling of human resourcesefficiently and effectively for the organization

Course Contents:

Unit:1: Introduction - Concept, nature, scope and significance of Human Resource Management. Evolution of Human Resource Management. Role and responsibility of Human Resource Manager

Unit-Il : Manpower policy and planning-Manpower policy-Nature, scope significance and Manpower Pokicy in India organization Manpower planning-Nature, scope, types, significance and manpower planning in Indian organization.

Unit-III : Training & Development - Training- Concept. nature, scope, significance Techniques of training in. Indian organization. Development- Concept, significance, and techniques Management Development Programme in Indian organization.

Unit-IV: Performance Appraisal -Meaning, nature, significance, Launching a Performance Appraisal System. Techniques of performance Appraisal, Shortcoming of Appraisal system performance Appraisal in Indian Organization.

Unit-V: Application of Concept of Motivation - Work motivation, MotivationTheories, Reward system, Job enlargement, Job enrichment, Jobrotation, Behavioral modification.

Suggested Reading :

1. Straw & Sayles: Personnel Management
2. Yoder & Dale Personnel Management
3. VSP Rao Human Resource Management Excel Books New Delhi
4. ED Flippos Principles of Personnel Management
1. 5 CB. Manmmoria : Personnel Management
5. Manappa&Saiyadian: Personnel Management
6. R.S. Dwivedi: Personnel Human Resource Management in Indian

203. BUSINEES ENVIRONMENT

Objectives :

The objective of this paper is to acquaint the students with the various necessary research aptitude.

Course Contents:

Unit-!: Business Environment - Meaning and components, need to understand Business environment, Economic Systems Capitalist, Socialist ad Mixed, Emerging Scenario-Global and Indian

Unit II : Socio-cultural Environment - Concepts of society, Ethics, Culture, Social change, Social responsibility of business, Social audit.

Unit III : Economic Environment - Economic role of Government, Concentration of Economic Power, Planning in India, Economic and Fiscal policies, Finances of State and Union, Public and Private Sectors. Industrial Licensing. Consumerism and consumer rights. Industrial policy, industrial development strategy and growth under Indian Planning.

Unit IV : Politico-legal Environment Constitution of India and its provisions affecting business. The law framing under Indian relations. Labour welfare and social security, workers ParticipationConstitution. Brief review of the laws framed for Industrialin Management, Protection of Patents and Trademarks.

Unit V : International Environment Brief understanding of InternationalOrganization- UNO, GATT, WTO world Bank IMF RegionalGroupings. Globalization Promotion of Foreign Trade.

Suggested Readings :

1. Francis Cherunilan : Business Environment
2. K Aswathappa: Business Environment
3. Suresh Bedi: Business Environment Excel Books
4. A.N. Agrawal. Indian Economy
5. Society - Mclver and Page.

204. FUCTIONAL MANAGEMENT

Objectives:

The aim of this paper is to acquaint the students which the various functional aspects of management and to enable them in understanding their importance and interdependence.

Course Contents:

Unit- I : Introduction - Meaning and significance of various function of management, Functional areas of management. Functions of functional management.

Unit-ll: Marketing Management - Definition and concepts, Selling Vs Marketing, Marketing Process Marketing Mix, Marketing Segmentation Marketing Environment.

Unit-III : Financial Management - Scope of financial functions financial goals, raising funds, shares, debentures and loan Budgetary Control

Unit-IV: Operations Management - Scope and functions of Operations Management. Types of Production Systems. Demand Forecasting and Inventory Control.

Unit-V: Personnel Management Definition, objectives, concepts. functions and importance of Personnel Management.Prerequisites for attaining the objectives.

Suggested Readings:

1. Philip Kale Marketing Management Analysis, Planning Implementation and Control
2. Tapan Panda Marketing Management - Excel Books
3. Sudhindra Bhat - Financial Management - Excel Books

205. ORGANIZATIONAL CHANGE ANDINTERVENTION STRATEGIES

Objectives :

The paper aims at equipping the students with the skills and knowledge to be able to identify needs of modifications in organizationkeep pace with the trends of the industry.

Course Contents:

Unit-l: Introduction The Concept, objectives, characteristics andmodels of organizational development.

Unit-II : Organizational Analysis & Development Process - Diagnosis tool. Techniques and Process of Organization Development OD Action Research Process.

Unit-III : OD Interventions-l- Classification, Factor influencing choice of OD intervention, Team interventions.

Unit-IV: OD Interventions-ll- Inter-group and Third party peace making interventions, Comprehensive interventions, Structural interventions.

Unit-V: Change Management - Change in Organization, Change Approaches Change Process, Resistance to Change,Management of Change.

Suggested Readings :

1. French W.I. and C.H. Bell : Organization Development
2. J.P. Singh: Organization Development: Concept & Strategies.
3. Chattupadhyay, Somnth and Udai Pareek: Management OrganizationalChange

206 ORGANIZATIONAL BEHAVIOUR

Objectives :

The objective of this paper is o input an understanding among the student regarding the individual groups and organizational variants effecting to organization.

Course Contents:

Unit-I : Introduction Concept of OB, Contributing disciplines to Organization structures and organization theories.

Unit-II : Individual Factors Individual behavior – Perception Learning, Ability, Attitude, Personality.

Unit-III : Learning & Motivation - Group Dynamics. Concept, type,Groups, Power and Politics.

Unit-IV: Organization Development - OD Interventions, Approaches

Unit-V:OD, Management of Charge. Confect Management - Factor, Cause and Approaches toresolve conflict Collaboration in Organization. Stress Management- Causes and Remedies InternationalDimension OB

Suggested Readings:

1. S.P. Robbins Organizational Behaviour
2. Fred Luthans: Organizational Behaviour
3. K. Aswathappa Organizational Behaviour
4. LM Prasad Organizational Behaviour
5. PO. Aquinas Organizational Behaviour Excel Books
6. RS. Dwivedi: Human Relations & Organizational Behaviour

207. QUALITY OF WORK LIFE AND TOTAL QUALITY MANAGEMENT (TQM)

Objectives :

The paper aims in creating cordial work environment by balancing relationship among working non-working and family aspects of life to improve the productivity of a concern

Course Contents:

Unit 1 : Introduction - Meaning, Concept inıportance and special issues in QWL, Principles and dimension, quality of work life. Quality of worksite and productivity

Unit-ll: Quality Circles Meaning, definition, concept and historical prospective of quality circle. Organizational structure of quality Circles. Techniques of quality circles, steps of quality circles benefit of quality circles, problem of quality circles

Unit-III: Total quality Management - Meaning, definition, concept, scope and principles of TOM. Methods of TOM. HRM and TOM. TOM Tools and Technique-Benchmarking. Outsourcing.

Unit-IV: Total ability through QMS Introduction relationship with ISO9000, ISO 9004, quality management system requirement ISO 14000

Unit-V: Case study - How to implement quality management initiative (1) Howlett Packed Company (1) Allen Bardly Company (iv) Brook Tree Company.

Suggested eadings

1. Mirza SSaiyadain Human Resource Management
2. P.C. Tripathi Human Resource Management
3. K Aswathappa Human Resource Management
4. Shaleridra Nigam: Total Quanty Management Excel Books

CC301. HUMAN RESOURCE PLANNING

Objective:

The objective of this paper is to develop conceptual as well as a practical understanding of human resource planning development and development in organization.

Course Contents:

UNIT-I:

Introduction – Need, approaches, dimensions, and process of human resource planning. A brief idea about employee welfare activities and facilities.

UNIT - II:

Demand and Supply – Forecasting demand – Methods and Sources at Micro and Macro Level.

UNIT - III:

Job Evaluation – Objectives, Limitations, Process and Methods. Job Analysis, Job Description, Job Specification.

UNIT IV:

Action Area – Selection and Recruitment, Induction and Placement, Performance and Potential Appraisals, Transfer and Promotion, Human Resource Planning in Global Environment.

Unit V:

Measurement of Human Resource Planning – Human Resource Information System, Human Resource Audit, Human Resource Accounting.

Suggested Reading:

1. Vivek Paranjpey: Strategic HRP
2. P. Job Branham : Human Resource Planning 3. Arthur, M. Career Prentice Hall Inc. 1991: Theory HandbookEnglewood Cliff
3. Dale, B. : Total Quality and Human Resource : An Executive Guide, Oxford Blackwell, 1992
4. Money, C. & Salama G. : Strategic Human Resource Management, Oxford Blackwell, 1995

CC302. Management Information System and Decision Support System

Objective:

The objective of this paper is to acquaint the student with the importance of the information system and application for the management of any organization.

Course Contents:

UNIT - I:

Introduction – Meaning and Concept of MIS, Historical background, MIS and other academic disciplines, Strategic issues in Computer Aided Decision Making, Role of MIS at various levels of Management, Framework for understanding MIS.

UNIT - II:

Structure of MIS – System Approach to MIS, Operating Elements of an Information System, MIS & Decision Making, MIS Structure based on Organizational Functions, Synthesis of MIS, Structure, Some Issues of MIS Structure, Evaluation of MIS.

UNIT – III:

Data Management & Information Handling – Need of Information, Levels of Information Handling. Characteristics of Computerization, Data Flow diagram, Data Dictionary, Data Based Management and Word Processing. Electronic Spread sheet and it's Managerial Applications.

UNIT – IV:

Decision Support System (DSS) – Characteristics, Structure and Class of DSS, DSS as an Aid to decision making, Support for Intelligence, Design and Choice, Decision Trees, Approaches to Development of DSS.

UNIT- V:

Human Resource Information System (HRIS) - Definition, Essentials and need of HRIS, Use of Computer in HRIS Need, Advantages, Audit of Information.

Suggested Reading:

1. Gordon B. Davis and Margrethe H. Olson : Management Information System.
2. Jerame Canter: Management Information System.
3. Murdick, Ross and Claggett: Management Information System.
4. Prince : Information system for Planning & System

CC303 - COMPENSATION MANAGEMENT

Objective:

The course is designed to promote understanding of the issues related to the compensation or rewarding human resource in the corporate sector, public services and other forms of organizations and to impart skills in designing, analyzing and restructuring reward management systems, policies and strategies.

Course Contents:

UNIT – I:

Basic wage concepts and theories, Types of wages, differential and components of wage structure.

UNIT–II:

Statuary provisions governing wage fixation system in India and types of wage payment system. Minimum wages Act. 1948, Objective, definitions, fixation and revision of wages, payment of minimum wages Equal Remuneration Act, 1976 – Objective, Scope, Definitions, Employees entitles. Payment of wages act 1936- Objective, Definition regarding payment of wages and deductions from wages.

Unit –III:

Understanding different components of compensation packages like Fringe Benefits, Incentives and Retirement Plans, Strategic Compensation Systems.

Unit – IV:

Compensation packages designed for specific types of Human Resource like Compensation of Chief Executive, Senor Manager's R & D staff etc. Tools used in designing, improving, and implementing compensation.

Unit – V:

Conceptual and theoretical understanding of economic theory related to reward management. Wage policy in India.

Suggested Readings

1. Adams, R & J Meltz N.M. Ed. : Industrial relation theory and its nature, scope and pedagogy, LMR press, Rutgers University, 1993.
2. Bergess Lenard R:Wage and Salary Administration, London charleE.Meril, 1984.
3. CapemanGeorge : Employees Share Ownership, New York, Kogan Page, 1991 Miction, Rock : Hand Book of Wage and Salary Administration, 1984
4. Armstrong. Michel and Muris, Heln : Reward management: A Handbook of SalaryAdministration, London Kegalpaul, 1988

DCE304 (A) MANAGEMENT TRAINING & DEVELOPMENT

Objective:

The purpose of this paper is to provide and in depth understanding of the role of training in the HRD and to enable to the course participant to manage the training system and process.

Course Contents:

UNIT – I:

Training Needs – Objectives of Training identification of training & Development Needs, Process and Assessment of Training Needs.

UNIT – II:

Learning Process – Principles of Learning Curve Approaches to training, Budgeting of Training.

UNIT – III:

Training Techniques – Designing Training Programmes, Programmes for levels of Management, Elements of Training System.

UNIT – IV:

Training System – Training techniques and aids, types of training, qualities of good trainer

UNIT – V:

Implementation & Evaluation of T & D – Administration and implementation of training and Development programme, Essential of Effective training process and criteria of Evaluation methods of Training Evaluation.

Suggested Reading:

1. Beunet, Roger ed: Improving Training Effectiveness, AldershotGover 1990
2. Buckley R. and Caple Jim: The theory & practice of training London, Kogan & page 1996
3. Lynton, R pareek U: Training for Development 2nd Ed. New Delhi, Vistar, 1990
4. Pepper, Allah D : Managing the Training and Development Function, Alder Shot.Gower 1984.

DCE 304 (B) - MANAGEMENT OF COMPARATIE INDUSTRIAL RELATION

Objective:

This course aims to familiarize students in the major industrial relations systems operating in different Economic, Political and Cultural Context.

Course Contents:

UNIT – I:

Industrial Relation Environment in India – Role and future of Trade Union, Emerging trends in Industrial relation. Trade unionism, Function and advantage, obstacles in the progress, Brief study of trade union act, 1926.

UNIT – II:

Discipline- Meaning and definition, objectives, major causes, Principles & procedure of Disciplinary action, action, Types of punishments, the role of personnel manager. Grievances – Meaning and definition, Nature, Causes of Grievances, Pre-requisites of Grievance Procedure, Grievance Management in India, Industry, and model Grievance.

UNIT – III:

Collective Bargaining – Meaning, definition, objectives, and types of collective bargaining. Process of collective bargaining. The Govt. and the Collective bargaining negotiation. Nature and purpose, negotiations or collective agreement in India.

UNIT – IV:

Employee empowerment and total quality management- Worker's participation in Management in India, Need, Concept and Scope of WPM Scheme of 1975.

UNIT – V:

I.L.O. Nature and objective, structure and function. Finance and Budget of ILO. Froms and types of industrial unrest in India, Globalization.

Suggested Readings:

1. Clark Jon : Managing Innovation and change, University of Southampton, 1995
2. Clark Jon : Human Resource Management & Technological change, London, Sage 1993
3. Cambell, A and WamerM. : Managing Innovation and cha University of Southamptom, 1995
4. Rastogi P.N.: Management and Technology and Innovation, New Delhi, Sage 1995
5. Warner M: New Technology and Manufacturing management, London Wiley, 1990
6. Whittaker D.H.: Managing Innovation Cambridge, University Press 1990

GE305 COUNSELING SKILLS FOR MANAGER'S

Objective:

The aim of this paper is to develop basic skills among students to independently handle a wide range of employee counseling and performance counseling.

Course Contests:

UNIT – I:

Introduction – Meaning, Definition, Nature and Scope of Counseling, Field of Application of Counseling, Needs for Counseling.

UNIT – II:

Counseling Contents and Process – Employee Counseling by Personnel Manager, beginning stage, Developing Stage and Termination Stage. Variables affecting the Counseling Process. Emotional Reduction Person Centered Therapy.

UNIT – III:

Attitude and Skills of Counseling- Counselor Skills, Assessing Client Problems, Selecting Counseling, Strategies and Intervention, Special Problems in Counseling, Psychoanalytic Theory.

UNIT – IV:

Behaviorual Counseling – The development ofbehavioural Therapy, Criteria for counseling goals, Role of the Counselor, Counseling relationship, Portrait of an effective counselor, Counselee factors, cognitive behavior modification.

UNIT – V:

Professional Counseling for Employee – Need and significance of transactional analysis, directive and non- directive approaches, reality therapy, rational emotive therapy, gestalt counseling and electric counseling.

Suggested Readings:

1. Employee Counseling : A.K.P. Sinha, Prachi pub. And dist. Pvt. Ltd. New Delhi 1990
2. Counseling for Career development, E.L. Tolbeot, New York, Mc-Graw Hill.
3. Introduction to Counseling : E.L. Tolbert, New York Mc-Graw Hill.

306. SUMMER TRRAING REPORT & VIVA-VOCE

401. Business Policy & Strategic Management

Objective :

The objective of this course is to develop a comprehensive approach to decision making by understanding the policy framing and execution aspects.

Course Contents:

UNIT – I : Introduction – Business Policy – Nature, Importance and purpose, components of strategic management – mission, policy, purpose, objective, Goal and tactics.

UNIT- II : Strategic Formulation- Environment Appraisal – Internal and external micro and macro Environment, SWOT, SAP, & ETOP Analysis, Environment Scanning – Methods, Factors and Approaches.

UNIT – III : Strategic Alternative and Choice – Strategic Alternative – Grand, Modernization Diversification, Integration, Merger, Take Over, Joint Venture, Turn Around, Disinvestment and Liquidation Strategic Choice- Process, Corporate, Portfolio, Industry, Competitors Analysis.

UNIT – IV: Strategic Implementation – Issue involved, Project and Procedural Implementation, Structural, Functional and BehaviouralImplementioan.

UNIT – V: Strategic Evaluation and Control – An overview, Strategic and Operatin Control. Techiniques and role of organization System.

Suggested Readings :

1. AzharKazmi : Busines policy
2. P.K. Ghos : Busines policy
3. R.M. Shrivastava : Corporate planning & strategy 4. FranciesCherunilum : Business policy

402. CROSS CULTURAL & GLOBAL HUMAN RESOURCE MANAGEMENT

Objective :

The objective of this course is to develop a diagnostic and conceptual understanding of the cultural and related behavioural variables in management of global organizations.

Course Contents:

UNIT – I : Introduction- Determinants of International Trade, Reasons for International Enterprises, Competitive advantage of nation, Strategic Planning process of multinational co-operation, evaluation of global organization.

UNIT –II: Considerations for MNC's Policy Formations- Cross National approaches cultural approach societal effect approach.

UNIT – III: HRM Practices in MNC's – I – HRD & Staff flow policy, composing an international staff and selection, Training & development.

UNIT IV: HRM Practices in MNC's – II - Comensation and appraisal, Industrial relations and worker's participation and Rehabliation problem.

UNIT V: Comparative Study- Comparative Study- Comparative Study of HRM Practices in America, Japan & European Countries.

Suggested Readings :

1. Beardwell&Holden : Human Resource Management
2. Alder N.J.: International Dimensions Organization Behaviour Boston, Kent, Publishing, 1995
3. Dowling P.J. etc. : International dimensions o Human Resource
4. Hofstede, G: cultures consequence :International differences in work relatedvalues, London, sage 1984

403. HRD IN SPECIALIZED SECTOR

Objective :

The aim of this paper is to acquaint the students with the role ofHRD

Course Contents:

UnitII : HRD in Public Sector, Characteristics, Rationale & objectives ofpublic sector, appointment & functioning of Government board, Forms of organization at micro and macro level. Welfare schemes &Industrial relations in Public sector.

Unit-II: HRD in Service sector - Banks, LIC, Forest Education, Health &Family welfare, defense& police administration.

Unit-III : HRD in NGO's - Characteristics, Pre and post-independence history of NGO's difference between voluntary organization & NGO's Areas of function & strategy contribution of voluntary organization in HRD, Voluntary Organization & foreign funding. Administration ofNGO

Unit-IV :HRD in Cooperative Sector Characteristics, Significance,Principles of Cooperative sector, Development of cooperatives inIndia. General body. Constitution & functioning of Board of directors, Human Resource planning & workers, participation in managementin cooperatives

Unit-V: HRD in Rural development - HRD in rural sector, measures ofrural development, determinants of rural development, Agriculture policy and HRD important issues.

Suggested Readings:

1. Jagdish Prakash : Administration of PES's in India
2. Singh & Kumar: Humar Resource Development
3. AA. Ansari : Cooperative Management
4. T.V. Rao : Strategies & Practices in HRD

404. INDUSTRIAL PSYCHOLOGY

Objective:
The aim of this paper is to acquaint the students with the psychological aspects of industrial workers and employees for solving work related problems

Course Contents:

Unit-I : Introduction - Definition, Nature, Scope significance, Historical Evolution of Industrial Psychology,

Unit-lI : Industrial Behaviour - Ability, Attitude, Job satisfaction Morale. Unit-III : Industrial Problems - Fatigue, Monotony, Alcoholism, Accident Psychological Conflict - Causes, Effect and Remedies.

Unit-IV : Employee's Turnover - Causes, Outcome and Mechanism to retain employee Absenteeism - Causes & Remedies. Migration of Labour - Reasons & Impact.

Unit-V : Socio Psychology - Family system, Marriage dependence. Housing & Health related Problems and its effect on their working.

Suggested Readings:

1. Morronicle: Industrial Psychology
2. T.H. Harell: Industrial Psychology
3. Girish Total : Industrial Psychology

405. BUSINESS LEGISLATION

Objective:

The aim of this paper is to assist the students in understanding basic laws affecting the operation of a Business Enterprise.

Course Contents:

Unit-1: The Indian Contract Act 1872 - Definition, Essential elements of a valid contract, kinds of contracts, how do Contract Arise, Quasi contract, Breach of Contract, and its Remedies.

Unit-Il : Sale of Goods Act, 1930 - Formation of a contract of sale, Essentials a contract of sale, Rights of an unpaid seller, Negotiable Instrument Act1881 : Meaning. Essential ingredients, special characteristics of aNegotiable instrument, promissory notes, Bills of exchange and cheques, dishonor and discharge of N.I. Type of N.L. distinction between negotiation and assignment.

Unit-Ill: The Companies Act, 1965 - Meaning characteristics of a company. Types of companies, incorporation of a company, memorandum andarticles of association, Prospectus.

Unit-IV : Share Capital and Allotment - Share certificate, share warrant anddividend on shares, Management and meetings of company accounts andaudits

Unit-V: Winding up of Company - Conversion of a private Co. into public Co. and a public co. into private co. Consumer Protection Act, 1986 – Definitionof consumer disputes redressal agencies, procedure for making complaint,Remedies available under the act and penalties.

Suggested Readings:

1. Avtar Singh Company Law, The Lucknow Easter 1996
2. KhergarmwalaJ.S. : The Negotiable Instrument Acts, Bombay, N.M. Tripathi 1980
3. Ramaiya : A guide to the Companies Act, Nagpur Wadhwa 1992
4. Shah, S.M.: Lecture on Company Law, N.M. Tripathi 1990
5. Tuteja S.K. Business Law for Mangers, New Delhi, S. Chand, 1998

406. DISSERTATION REPORT

The student in fourth Semester have to undergo dissertation work in Human Resource Development/Management on the topic allotted by Department. This work will be carried out by the student under the supervision of the faculty.

The students are required to submit a Dissertation Report before the commencement of fourth Semester examinations. The project will be of 100 marks.

The report will be evaluated by one internal and external examiner

407. COMPREHENSIVE VIVA-VOCE

A comprehensive viva-voce of all the papers studied by the student from I to IV Semester including dissertation will be held. This will be taken by one internal and external examiner. This will be of 100 marks.

STUDY CENTRE FOR TOURISM
A.P.S. University Rewa (M.P.)

(C.B.C.S. Pattern)

M.B.A. (TOURISM ADMINISTRATION)

STUDY CENTRE FOR TOURISM

M.B.A. (Tourism administration) Scheme of Examination C.B.C.S. Pattern

Paper Code	Nomenclature	Type of Course	Theory Assessment		Internal Assessment		Total	Credit Points
			Max.	Min	Max.	Min.		
Semester-I								
101	Concept and Principles of Tourism	CC	60	24	40	14	100	3
102	Principles and Practices of Management	CC	60	24	40	14	100	3
103	Tourism Products and Resources	CC	60	24	40	14	100	3
104	Policy & planning in Tourism	CC	60	24	40	14	100	3
105	Computer Application	CC	60	24	40	14	100	3
106	Communication Skill	CC	60	24	40	14	100	3
107	Indian Art & Culture	GE	60	24	40	14	100	3
108	Viva-Voce	-	-	-	-	-	100	4
Semester-II								
201	Travel Agency Management	CC	60	24	40	14	100	3
202	Research Methodology	CC	60	24	40	14	100	3
203	Organisational Behaviour	CC	60	24	40	14	100	3
204	Tourism Marketing	CC	60	24	40	14	100	3
205	Human Resource Management	CC	60	24	40	14	100	3
206	Financial Management	CC	60	24	40	14	100	3
207	Event Management & MICE	GE	60	24	40	14	100	3
208	Viva-Voce Comprehensive	-	-	-	-	-	100	4
Semester-III								
301	Hotel & Resort Management	CC	60	24	40	14	100	3
302	Service Marketing	CC	60	24	40	14	100	3
303	Consumer Behaviour OR Hospitality Management	DCE	60	24	40	14	100	3
304	Ethical Legal & Regulatory Aspects of Tourism	CC	60	24	40	14	100	3
305	Hotel Accounting	CC	60	24	40	14	100	3
306	Foreign Language Course (French) OR Foreign Language Course (German) OR Foreign Language Course (Japanese)	GE	60	24	40	14	100	3
307	Job Training Report	-	-	-	-	-	100	8
308	Viva-Voce (Comprehensive)	-	-	-	-	-	100	4

Semester-IV								
401	Strategic Management	CC	60	24	40	14	100	3
402	Heritage Management OR Rural Tourism	CC	60	24	40	14	100	3
403	Tour Operations Management	DCE	60	24	40	14	100	3
404	Eco Tourism	CC	60	24	40	14	100	3
405	Tourism Geography	CC	60	24	40	14	100	3
406	Advertising Management OR Retail Management	GE	60	24	40	14	100	3
407	Dissertation Report	-	-	-	-	-	100	8
408	Viva-Voce (Comptehensive)	-	-	-	-	-	100	4

CC – Core Course, GE – Generic Elective, DCE – Discipline Centric Elective

M.B.A. (Tourism Administration)

Semester – I

101 :- Concept and Principals of Tourism

Objective : This will introductory module giving the basis of tourism studies. This will give an overview of tourism industry and various organisations.

Course Contents :

Unit – I **Introduction** : What is Tourism? Definitions and Concepts, tourist destination, services and industry, definition and historical development, Past to 2nd world war, recent and current 1945-2002, Future from 2002 onwards. General Tourism Trends. Types of Tourists, Visitor, Traveler, and Excursionist – Definition and differentiation. Tourism, recreation and leisure, their inter – relationships.

Unit – II **Tourism Products & Attraction** : Nature, Characteristic and Components of Tourism Industry. Why it is different from other types of consumer product? Elements and characteristics of tourism products. Tourism product production system, Tourism Product Life Cycle, typology of tourism products.

Unit – III **Types and Forms of Tourism** : Inter- regional and intra-regional tourism, inbound and outbound tourism, domestic, international tourism. Forms of Tourism: religious, historical, social, adventure, health, business, conferences, conventions, incentives, sports and adventure, senior tourism, special interest tourism like culture or nature oriented, ethnic or 'roots' tourism and VFR.

Unit – IV **Tourist Transportation:**

Air transportation : The airline industry present policies, practices. Functioning of India carriers. Air Corporation Act, Air charters.

Surface Transport : Rent-a-car Scheme and Coach-Bus Tour, Fare Calculation. Transport & Insurance documents, All India Permits

Rail Transport : Major Railway systems of World, (Euro Rail and Amtrak) General information about Indian Railway, Types of rail tours in India:, Place-on-Wheels and Royal Orient, Deccan Odessy, Toy Trains. Indrail Pass.

Water Transport : Historical past, cruise ships, ferries, hovercrafts, river and canal boats, Fly-cruise.

Unit – V **A study of International Tourism Organisations** : Origin, location and functions of WTO, IATA, PATA, ASTA, UFTAA, and ICAO.

Suggested Readings :

- Mill and Morrison, (1992), The Tourism System: An Introductory Text, Prentice Hall.
- Cooper, Fletcher et al, (1993), Tourism Principles and Practices, Pitman.
- Burkart and Medlik, (1981), Tourism: Past, Present and Future, Heinemann, ELBS.
- Mill, R.C., (1990), Tourism: The International Business, Pretience Hall, New Jersey.
- Bhatia, A.K., - International Tourism
- Seth, P.N., (1999) Successful Tourism Management (Vol 1 & 2)

Semester – I

102 : PRINCIPLES AND PRACTICES OF MANAGEMENT

Objectives : This module explains meaning of management and analyses its process in modern organisations including tourism and travel.

Course Contents :

Unit – I **Management :** Concept, Nature, Process and significance of Management. Management as an art and science; Management as profession skill and roles of managers in organisation; Evaluation of management theory, schools of management thoughts.

Unit – II **Functions of Management** : An overview of functions of management; Concepts of POSDCORB Planning : Nature, purpose, types and process, Management By Objectives (MBO) Decision Making process, tools and techniques. Decision making components of effective decision making.

Unit – III **Organisaing** : Concept of organising and organisation. Line and Staff Authority and responsibility, span of control, Delegation of authroity, centralisation versus decentralisation. Organisation Structure and design. Staffing and Selection Process.

Unit – IV **Directing** : Communication – Process and Types; Barriers and principle of effective communication (Horizontal and Vertical communication), Motivation – theories and practices.

Unit – V **Leading** : Leadership – Concept, Theories of Ladership, styles, Successful effective leadership style in travel trade and hospitality organisations. Concept of Controlling.

Suggested Readings :

- Essential of Management – Harold Koontz & Heinsz Weirich.
- Management – H. Koontz & Cyrill O' Donnell.
- Management Theory – Jungle, H. Koontz.
- Principles of Management – Peter F. Drucker.
- Management Concept – V.S.P. Rao, Konark Publishers
- Principles & Practice of Management – L.M. Prasad, S. Chand.
- Organization & Management – R.D. Agrawal, Tata Mc Graw Hill.
- Modern Business Adminstration – R.C., Pitman.

Human Resources Management _ Railey M., Butterworth Heinemann

Semester – I

103 : Tourism Products and Resources

Objective : The module gives information of countries tourist places of national and international importance and it helps students to know the background elements of tourism resources.

Course Contents :

Unit – I **Natural Resources** : Tourist products : desiuiton and disserentiation wildlife Sanctuaries, National Parks and Natural Reserves in India (Jim Corbett Tiger Reserve, Bharatpur Bird Sanctuary, Valley of Flowers, Kanha, Kaziranga, Sasan Gir, Dachigam, Ranthambhore and Keoladeo Ghana).

Hill Stations : Study of Hill Station attractions and their environs with case studies of Mussoorie, Nainital, Munnar and Ooty.

Beaches and Isalands : Beaches in Goa, Kerala, Orissa. Andman Nicobar & Lakshdvip islands.

Unit – II **Popular Tourist Resources** : Delhi, Agra, Jaipur, Khajuraho, Varanasi, Mumbai, Kolkata, Chennai, Bangalore, Hyderabad, Mahabalipuram, Madurai, Tanjore, Hampi, Ellora, Elephanta, Konark and Fatehpur Sikri

Monuments – Qutub Minar, Atala Mosque (Jaunpur), Kirtistambha (Chittor), Sher Shah Suri's Tomb, Sikandara, Red Fort (Delhi), Taj Mahal, Goldern Temple (Amritsar) Hawa Mahal (Jaipur), Bara Imambra (Lucknow).

Unit – III **Pilgrimage Destinations** : Hindu – Charo Dham Yatra, Jyotirlinga Yatral, Devi Yatra Vindhyachal (U.P.) Kamakhya (Assam), Vaishnodevi, Kashi, Pryag, Gaya, Ayodhya, Mathura- Vrindavana, Allahabad, Ujjain, Haridwar, Nasik, Gangasagar.

Buddhist : Lumbini, Bodhgaya, Sarnath, Kushinagar, Sharavasti, Sankisa, Vaishali, Rajgriha, Kapilvastu, Nalanda, Sanchi, Ajanta.

Jain : Kashi, Pavapuri, Shatrunjaya, Girnar, Mt. Abu, Sharavanbelgola, Palitana

Muslim : Ajmer Sharif, Nizamuddin (Delhi), Fatehpur Sikri, and some important Mazars.

Sikh : Patna, Nanded, Guru-ka-Tal (Agra), Amritsar.

Saint : Kabir, Tulasi, Raidas, Sankarcharya. '

Unit – IV **Fairs and Festivals** Musics Dance, Kumbha, Pushkar, Sonepur, Dadari, Tarnetar, Chhata, Pongal/Makar Sankranti, Baishakhi, Meenakshi Kalyanam, Holi, Gangaur, Onam, Durga Puja, Ramalila, Diwali, Kartik Purnima (Dev Deepawali, Guru Parb), Dashahara (Kullu), Rathyatra, Nag Nathaiya (Varanasi), Bhrawafat, ID-ul-Fitr, Easter, Christmas, Carnival (Goa), Burhawa Mangal (Varanssi), Ganga Mahotsava, Taj Mahotsava, Khajuraho Mahotsava and Desert Festival.

Unit – V **Souvenirs -** Handicrafts and Handlooms. History of Dance Style and main Gharanas of North Indian Music, History of Drama in India and its present scenario.

Suggested Readings :

- Gupta, SP, Lal, K, Bhattacharya, M. Cultural Tourism in India (DK Print – 2002)
- Dixit, M and Sheela, C. Tourism Products (New Royal Book, 2001)
- Oki Morihiro, Fairs and Festivals, World Friendship Association, Tokyo, 1988.

- Mitra, Devla, Buddhist Architecture, Calcutta.
- Michell, George, Monuments of India, Vol. 1. London.
- Devies, Philip, Monuments of India, Vol. II., London
- Brown Percy, Indian Architecture (Buddhist and Hindu), Bombay.
- Brown Percy, Indian Architecture (Islamic period), Bombay.
- Hawkins. R.E., Encyclopaedia of Indian Natural History.
- Vatsayana, Kapila, Indian Classical Dance, New Delhi.
- Swami, Prayaganand, History of Indian Music.
- Jain, Jyotindra & Arti, Aggrawala : National Handicrafts and Handlooms Museum.
- Mode. H. & Chandra. S. : Indian Folk Art, Bombay.
- Mehta. R.J. : Handicrafts & Industrial Arts of India, New York.

Grewal, Bikram (ed) : Indian Widlife.

Semester – I

104 – Policy and planning in Tourism

Objective : The Module will expose the students about the tourism policy of India and of a few tourism states of the country.

Unit – I **Introduction** : Concept of Policy, Formulating tourism policy, Role of government, public and private sectors, Role of international multinational, state and local tourism organisations in carrying out tourism policies.

Unit – II **Tourism Policy** : Study of National Tourism Policy 1982 and 2002, National Action Plan on Tourism, 1992: Special Tourism Area Development Programme. The concept of National Tourism Board, National Committee on Tourism, Case study of tourism policies of a few state (Uttar Pradesh Rajasthan, Kerala, Madhya Pradesh,). Investment opportunities and government policy for investment in hotel/tourism industry. Sources of funding.

Unit – III **Understanding Tourism Planning** : Conceptual meaning of Tourism Planning, Evolution of Tourism Planning General Concepts of Planning, Level and Types of Tourism Planning, Background Approach and planning scale. Public and Private sectors role in Tourism Development. Analysis of an individual Tourism Project (development of the Buddhist circuit)

Unit – IV **International Agreements** : Chicago Convention, Warsaw Convention, Open Sky Policy, Bermuda Convention, Euro Agreement, Schengen Agreement,

Suggested Readings :

- New Inskeep, Edward, Tourism Planning : An Integrated and Sustainable Development Approach (1991) VNR, New York.
- Ashworth, G. J. (2000), The Tourist Historic City. Retrospect and Prospect of Managing the Heritage City, Pergamon, Oxford.
- Dept. of Tourism, GOI Investment Opportunities in Tourism (Brochure).
- Sharma, J.K. (2000), Tourism Development. Design for ecological sustainability, Kaniska Publication, New Delhi

Semester – I
105 – COMPUTER APPLICATION

Objectives : The Module is prescribed in the course to inform the students about the role of Computer Information systems in travel trade. The prescribed unit enhance the skills of students especially when they will be attached for practical.

Course Contents :

Unit – I **Basic Computing** : An appreciation of computer hardware and terminology, The use of an operating system, various programming language, A descriptive survey of some of the important application : communication, office systems, information storage and retrieval of Data.

Unit – II **Office Work** : The study and use of typical micro-computer storage software packages such as word processor, spreadsheet and MS Office (Word, Excel, Powerpoint, Access and Outlook Express)

Unit – III **Internet** :- Management information systems, Office automation, E-mail and electronic highway, Internet, Web Page Designing.

Unit – IV **Computer Networking** : What is CRS, How it functions. CRS for Rail Transport, Hotel Bookings Airlines: Different packages used : Abacus, Fantasia, Amadeus, Apollo-Galileo, Sabre etc. Use dummy of one for the CRS packages (if available). Practical of CRS.

Unit – V **Computer Presentation** : Introduction to a statistical package (SPSS), Presentation Graphic Tools. Multimedia technology. Role of Computers in Travel and Tourism.

Suggested Readings :

- Lucey T, Management Information Systems, DP Publications.
- Clark A, Small Business Computer Systems, Hodder & Stoughton, 1987.
- Parkinson LK & Parkinson ST, Using the Micro-computer in Marketing, McGraw Hill, 1987.
- Braham B, Computer System in Hotel & Catering Industry, Cassell, 1988.
- Basandra S.K., 'Compute Today', New Delhi : Galgotia Publications.
- Mehta Subhash, "Wordstar – 7", New Delhi : Comdex Computer Publishing, Pustak Mahal.

Semester – I
106 – Communication Skill

Objectives : The course is aimed at equipping the students with the necessary techniques and skills of communication to inform others, inspire them and enlist their activities and willing cooperation in the performance of their jobs..

Course Contents :

Unit – I **Introduction**: Definition and process of communication, Essentials of effective communication in organizational effectiveness, Use of grapevines.

Unit – II **Oral Communication** : Publication Speech-Composition, Priciples, Speech delivery and Speech Skills, Interview pre-planning for interview, facing the interview board. Group discussion – Qualities looked for in GD's, DO's & DOn't of GD's, Communication in communities, Seminars and Conferences.

Unit – III **Non-Verbal Communication:** Importance of non verbal communication, Facial Expressions, postures Body Movement, Gestures, Eye Control, Haptics etc. Listing Difference between Listing and Hearing. Listing Processes & Types.

Unit - IV **Report Writing and Job Application** : Structure of Reports, Preparatory steps in writing reports, use of illustrations and questions, process of writing the reports, Importance and functions of job application letters, Drafting the application, preparation of curriculum vitae.

Unit – V **Business Correspondence** : Essentials of effective business correspondence, Structure of a Business letter. Forms of letter layout. Types of business letters – Enquiries and replies, orders and their execution, complaint and response letter, sale letter, Thanks letter etc.

Suggested Readings :

- Bowman, Joel P. and Branchaw, Bernadine P. "Business Communication: From process to product" 1987, Dryden Press Chicago.
- Rodrigues, M.V., Effectives Business, Communication, 1992, Concept Publication Co. New Delhi
- Kothari, C.R., Research Methodology.

List of cases, recent articles and specific references will be announced in the Class-room at the time of launching of the course.

Semester – I
107 – Indian Art & Culture

Unit – I Structure of Indian Society – Varnasharm System, caste purshartha, samsakara.

Unit – II Comparative study of communication – Hindu, Sikh, Christion, Muslim and Tribals, Indian religion & philosophy – Vedic, Saivism, Vaishnavism, Buddhism & Jainism, Gita its importance and teaching.

Unit – III Sailent feature of ancient Indian Act, Main features of Harappan art, Origin and development of stupa architecture, Main features of Gupta art.

Unit - IV Ancient Indian paintings with special reference to Ajanta & Bagh, Temple architecture Khajuraho & Orrisa, Art and architecture under mugal rulers from Babav to Shahjahan.

Unit – V Painting – Mugal, Rajpur and Kangra, Feature of Christian art.

Suggested Readings :

- Gupta, S.P. Lal, K. Bhattacharya, M. Cultural Tourism in India (D.K. Print- 2002).
- Dixit, M. & Sheela, C. Tourism Products (New Royal Book, 2001).
- Mitra, Devla, Buddhist Architecture, Culcutta.
- T.A. Gopinath Rao, Element of Indian Iconography.
- Subodh Kapoor, Indian God & Goddes.
- A.S. Altekar, Hindu Civilization.
- Joly, Hindu Law & Custom.

Semester – I
108 : Viva-Voce

Semester – II

201 : TRAVEL AGENCY MANAGEMENT

Objective : The students will understand the conceptual meaning and differentiation between Travel agency and Tour operation. Further they will understand formalities and documentation needed to set up the units.

Course Contents :

Unit – I **Travel formalities** : Travel Formalities : Passport, Visa, Health requirements, taxes, customs, currency, travel insurance, baggage and airport information. Travel Agency and Tour Operation Business : History, Growth, and present status of Travel Agency. Definition of Travel Agency and differentiation between Travel Agency and Tour Operation business. Travel Agency and Tour Operators: Linkages and arrangements with hotels, airlines and transport agencies and other segments of tourism sector.

Unit – II **Approval of Travel Agents and Tour Operators** : Approval by Department of Tourism, Government of India. IATA rules and regulations for approval of a travel agency, Approval by Airlines and Railways.

Study of various Fiscal and Non-Fiscal incentives available to Travel agencies and Tour Operations business.

Unit – III **Functions of a Travel Agent** : Understanding the functions of a travel agency – travel information and counselling to the tourists, Itinerary preparation, reservation, ticketing, preparation and marketing of Tour packages, handling business/corporate clients including conference and conventions. Sources of income: Commission, Service Charges. Travel Terminology : Current and popular travel trade abbreviations and other terms used in preparing itineraries.

Unit – IV **Functions of a Tour Operator** : Market research and tour package formulation, assembling, processing and disseminating information on destinations, Liasioning with principls, preparation of Itineraries, tour operation and post tour Management. Source of income for tour operation.

Unit – V **Public and Private sector in Travel Agency Business and Tour Operation Business**: Organisational Structure and various Departments of a Travel Agency. Case study of ITDC. Case study of SITA, Cox & Kings, TCI and Thomas Cook.

The Indian Travel Agents and Tour Operators – and overview. National Trade Associations : IATO and TAAI.

Suggested Readings :

- Holloway, J.C., (1983), The Business of Tourism, McDonald and Evans, Plymounth.
- Syratt Gwenda, (1995). Manual of Travel Agency Practice, Butterworth Heinmann, London
- Stevens Laurence, (1990). Guide to Starting and Operating Successful Travel Agency, Delmar Publishers Inc., New York.

Semester – II

202 : RESEARCH MEATHODOLOGY

Objective : To equip the students with the basic understanding of the research methodology and to provide an in sight in to the application of modern analytical tools and techniques for the purpose of management decision making.

Course Content :

Unit – I **Introduction** : Nature and Scope of Research Methodology, Problem Formulation and Statement of Research Cost and Value of Information. Types of Research. Research objectives, Criteria for a good research, Research organisation in india.

Unit – II **Research Process** : Steps in the Process of Research Design – Exploratory, Descriptive and Experimental Research Designs. Sample Design – Steps in sampling criteria for selecting a sample procedure sampling method and sample size.

Unit – III **Methods of Data Collection** : Collection of Primary data : Observation interview Questionnaire Method, Questionnaire Design, Questionnaire vs Schedule, Attitude measurement techniques, motivational research techniques.

Unit – IV **Method of Data Representation and Analysis** : Use of graphs, Charts and maps in data representation, Measures of Central Tendency and dispersion measures of relationship. Statistical test. Advance Technique for data analysis ANOVA, multivariate Analysis.

Unit – V **Research Report Preparation :** Preparation of Research Report, Layout of Report, Preparatory steps in writing research. Use of computers in research. Statistical Software package.

Suggested Readings :

- Kothari C.R. , Research Methodology, Willy Eastern Limited, New Delhi 1994.
- Bennet, Roger : Management Research, ILO, 1983.
- Gupta S.P. Statistical Methods, 30th ed, Sultan Chand, New Delhi 2001.

The list of cases and specific references including recent articles will be announced in the class.

Semester – II

203 : ORGANISATIONAL BEHAVIOUR

Objectives : The module helps to understand the key dimensions, processes and influences upon human behaviours at the level of individual and the group in the context of work organisations.

Organisational Behaviour :

Unit – I **Meaning & Nature of Organisation** : system approach.

Unit – II **Groups dynamics**: Type of groups, process in group, Group bahaviour and Group think.

Unit – III **Organization Structure :** Types, differences, organizational chart & its use.

Unit – IV **Organisation, Effectivenss and Development :** Social responsibility of organization, consumer bahaviour.

Unit – V **Organisation Climate** : Organisational change, Conflicts and their Management.

Suggested Readings :

- Robbins, Stephens P, Organisational Behaviour
- Prasad LM, Organisational Behaviour
- Luthans, Fred, Organisational Behaviour
- Hersey and Balanchard, Management of Organisational Behaviour.
- Veechio RP, Organisational Behaviour, Dryden Press 1998.
- Invancevich JM and Mateson MT, Organisational Behaviour and Management.
- Hoyer, Consumer Behaviour, 1998.

Semester – II

204 : TOURISM MARKETING

Objectives : The course includes the operation techniques of tourism marketing. The students are expected to attain a basic knowledge of marketing principals, study to suitability of alternative promotional approaches to and formulate marketing plans and promotional approaches to tourism and other related organizations.

Course Content :

Unit – I **Marketing** : Core concepts in marketing; Needs, Wants, Demands, Products markets. Marketing management philosophies-Production, Product, Selling, Marketing and societal perspectives. Economic importance of marketing.

Unit – II **Analysis and selection of market :** Measuring and forecasting tourism demand; Forecasting methods, Managing capacity and demand. Market segmentation and positioning (STP)

Unit – III **Marketing Strategies :** Developing marketing environment, Consumer buying behaviour, Competitive differentiation and competitive marketing strategies. New product development. product life cycle, Customer satisfaction and related strategies in internal and external marketing; Interactive and relationship marketing.

Unit – IV **Planning marketing programmes** : Produt and product strategies; Product line, Product mix Branding and packaging. Pricing considerations. Approaches and strategies. Distribution channels and strategies.

Unit – V **Tourism Marketing** : Service characteristics of tourism. Unique features of tourist demand and tourism product, Tourism marketing mix. Marketing of Tourism. Services : Marketing of Airlines, Hotel, Resort, Travel Agencies and other tourism related services-Challenges and strategies.

Suggested readings :

- Kotler, Philp : Marketing Management & Hospitality and Tourism Marketing
- Sinha, P.C. : Tourism marketing
- Vearne, Morrisson Alison : Hospitality marketing
- Kotler, Philip and ARmstrong Philip, Principle of Marketing, 1999, Prentice-Hall India. 1999
- Assael H., Consumer Behavior and Marketing Action (2nd edn. 1985) kent, Boston.
- Crough, Marketing Research for Managers.
- Singh Raghubir, Marketing and Consumer Behaviour.
- Patel, S.G. Modern Market Research, Himalays Publishing.

Semester – II

205 : HUMAN RESOURCE MANAGEMENT

Objectives : In a complex word of industry and business, organisational efficiency is largely dependent on the contribution made by the members of the organisation. The objectives of this course is to sensitize students to the various facets of managing people and to create an understanding of the various policies and practices of human resource management.

Course Content :

Unit – I **Introduction** : Concepts and Perspectives on Human Resource Management; Human Resource Management in a Changing Environment; Corporate Objectives and Human Resource Planning; Career and succession Planning; Job Analysis and Role Description;

Unit – II **Recruitment & Training** : Methods of Manpower search; Attracting and Selecting Human Resources: Induction an Socialisation; Manpower Training and Development; Performance Appraisal and Potential Evolution;

Unit – III **Compensation** : Job Evalution, Wages and Salary Administration, Employee's Benefit Programmes, Groups and Individual incentives and Fringe Benefits, Organisational Participation and Productivity sharing.

Unit – IV **Managerial Skills** : Introducing Change and its managerial problems, Discipline, Absenteeism and Employee Turnover, Conflict Management, Grievance Handling.

Unit – V **Industrial Relations** : Employee Welfare; industrial Relations & Trade Unions; Dispute Resolution & Grievance Resolution & Grievance Management; Employee Empowerment.

Suggested Reading :

- Aswathappa. K. Human Resource and Personnel Management Tata Mc Graw Hill, New Delhi, 1997
- De Cenzo, DA & Robins S.P. Human Resource Management 5th ed. New York. John Wiley, 1994.
- Monappa, A & Saiyadain M. Personnel Management 2nd ed. New Delhi, Tata Mc Graw Hill 1966.
- Mammoria C.B. Personnel Management, New Delhi, HPH, 1996.

The list of cases and specific references including recent articles will be announced in the class at the time of launching of the course.

Semester – II

206 : FINANCIAL MANAGEMENT

Objectives : The basic objectives are accountings finance management principles and to understand the basic techniques of preparing financial information.

Unit – i **Meaning, Role, Scope and Importance of Financial Management** : Job of the financial Manager, financial Goals, financial control, Organization and objective of financial function.

Unit – II **Financial Planning, Capitalisation and Capital Structure** : Meaning, concept of capital, Theories of capitalization, Over capitalization and under capitalization, optimum capital structure, Determinant of capital structure, Financial Leverage, Debt capacity of company Debt equity ratio.

Unit – III **Working Capital Management**: Concept, need, determinant of working capital, estimates of working capital and financial of current assets. Capital Budgeting and Capital Investment Decision: Management of Fixed Assets, Meaning, roles and analysis of capital investment in fixed assets:

Unit- IV **Financial Statements and Analysis:** Meaning, Analysis- Ratio, Fund flow, Cash flow, Cost volume Analysis. Tourism Finance Corporation of India TFCI: Aims, Objectives and Functions.

Unit – V Special Topics in Finance : International financial Management, Financial Planning & forecasting, Green Finance, Venture, Capital Finance, Financial Engineering. Case study related to the entire Syallbus.

Suggested Readings :

- Anthony and Reece, Management Accounting Principles: Text and Cases
- Pandey, L.M., Management Accounting: A Planning and Control Approach, Vikas Publication.
- Davis D., The Art of Managing Finance, Mc Graw Hill.
- Pandey, I.M., Financial Management, Vikas Publication
- Van Horne, Financial Management and Policy, Prentice Hall.
- Pandey, I.M. and Bhatt, Ramesh, Cases in Financial Management, TATA Magraw Hill.

Semester – II

207 : EVENT MANAGEMENT & MICE

Objective : As a result of participating in this module, students will understand the managerial and operational aspects pertaining to event and conference or Convention Management.

Course Contents :

Unit – I **Event Management** : Role of events for promotion of tourism, Types of Events – Cultural, festivals, religious, business etc. Need of event management, key factors for best event management. Case study of some cultural events (Ganga Mahotasava, Lucknow mahotsava and Taj Mahotsava)

Unit – II **Concept of MICE** : Introduction of meeting incentives, conference/conventions, and exhibitions. Definition of conference and the components of the conference market. The nature of conference markets and demand for conference facilities. The impact of conventions on local and national communities.

Unit – III Management of Conference at Site, Trade shows and exhibitions, principal purpose, types of shows, benefits, major participants, organisation and membership, evaluation of attendees. Convention/exhibition facilities; Benefits of conventions facilities, Inter-related venues, Project planning and development.

Unit – IV Budgeting a Conference Exhibition: Use of Budget preparation, Estimating fixed and variable costs, cash flow, sponsorship and subsidies. Registration, Seating Arrangements, Documentation, interpreting press relation, Computer Graphics, Teleconferencing, Recording and Publishing Proceedings; Interpretation and language.

Unit – V Role of travel Agency in the management of conferences. Hotel Convention Service Management : Human Resources Management Transportation. Group Fares, Airling Negotiation, Extra Services, Cargo Transportation. History and function of ICCA, Role of ICCA, Roles and function of ICIB.

Suggested Readings :

- Coleman, Lee & Frankle (1991), Powerhouse Conferences. Educational Institute of AH & MA.
- Hoyle, Dorf & Jones (1995), Meaning conventions & Group business. Educational institute of AH & MA.

Semester – II

208 : VIVA-VOCE

COMPREHENSIVE

Semester – III

301: HOTEL & RESORT MANAGEMENT

Objectives : This Module is prescribed to appraise students about the important departments of a classified hotel and to teach various aspects related to accommodation Industry.

Hotel Management :

Unit- I Origin and Expansion: Conversion of Tavern; Inns, Chalets and places into hotels, creation of private, Public and Multinational hotel chains in India. Regional, National and International Hotel Associations and their operation.

Unit –II Departments of hotel : Front Office, House Keeping, Food and Beverage, Personnel and Accounts, Role and Functions of different departments.

Unit- III Requirements and Procedure for Constructing Classified Hotel: Prescribed application form for approval of Hotel Projects. Regulatory conditions and Guide lines for approval of Hotel Projects. Star categorisation, sources of Finance, Incentives and subsidy extended to Hotels in Tourist areas, and Tourist Backward areas. Hotel Related technical words.

Resort Management :

Unit- IV Resort Concept : Characteristics of Resort Management as opposed to Hotel Management, Historical Perspective, Indian Scenario.

Unit – V Resort Planning : Preliminary Consideration in Resort Planning and Development and Phases of Resort Planning and Development. Trends and factors in Developed Tourist Markets leading to growth of Resort Concept. Factors affecting rate. Basic Elements of a Resort Complex: Loading facilities, landscaping, Dinning and drinking facilities, Family Oriented Services, shops and services, Entertainment; Use of Community Resources.

Unit- VI Resort Management: Resort Management and Sales Promotion: Research and Analysis: The environment, current market, properly analysis, Market segmentation and potential guest markets, Tools of marketing, Advertising, Promotion and Publicity.

Suggested Readings:

- Selected case studies from sterling. Delmia, Toshali and R.C.I. International will be managed from concerned organisations.
- Andrews, Sudhir: 1985, Hotel Front Office, Tata MC Graw- Hill, New Delhi.
- Andrews, Sudhir: Hotel House Keeping, Tata M C Graw- Hill, New Delhi.
- Andrews, Sudhir: Hotel House Keeping, Tata M.C. Graw-Hill, New Delhi.
- Andrews, Sudhir: (1991), Food and Beverage Service, Tata M C Graw- Hill, New Delhi.

Semester – III

302: SERVICE MARKETING

Objective – The objective of this course is to develop insight into emerging trends in the service sector in developing economy and tackle issues involved in the management of services on national basis.

Unit-I Introduction: Service Marketing – Origin, Concept and Growth, Service Marketing, Designing of Services strategy in context.

Unit-II Phases of Service Marketing: Emergence of service economuy: Nature of services, Goods and Services marketing, Marketing challenges in service business, Marketing Framework for service business.

Unit-III Classification of Service Marketing-I: Service classification, Banking – The concept of Bank and Insurance Marketing, Factors governing customers psychology, factors influencing the consumer behavior, Market segmentation, Marketing mix for banking and Insurance services.

Unit-IV Classification of Service Marketing-II: The concept of Transport, Tourism, Hotel and hospital services and their marketing patterns, The effecting issues of their customers and marketing mix and Segmentation.

Unit-V Marketing issues of Services Advertising – Issues involved the advertisement, Branding and Packaging of services, Relationship Marketing and CRM.

Suggested Readings:

- Jha S.M. : Services Marketing Himalaya Publishing House, 1994, Is ted.

The list of cases and specific references including recent articles will be announced in the class of the time of launching of the course.

Semester – III

303: CONSUMER BEHAVIOUR

OR

HOSPITATLITY MANAGEMENT

Objective : The basic objectives of the course is to develop and understanding about the consumer decision – marketing process and its applications in marketing function of firms.

Unit – I Introduction : Introduction to consumer Behaviour, Consumer Behaviour and Marketing strategy, Consumer Involvement and Decision Marketing, Information Search Process, Evaluation oriteria and Decision Rules.

Unit – II Motivation & Perception Consumer Motivation, Need and Goals, Positive & Negative motivation, Dynamic Nature of consumer motivation , Consumer Perception, Conceptual Framework, Dynamics of Perception, Consumer Imaging.

Unit-III Attitude & Personality, Consumer Attitude and attitude change, Influence of personality and self concept on Buying Behaviour, Psychographics and Lifesle, AIO & VALS Classification.

Unit-IV Influence on CB; Reference Group Influence; Diffusion of Innovation, Diffusion Process, Adoption Process, Profit of Consumer Innovent and Opinion Leadership Family Decision Marketing, Family Functions and Family life style.

Unit-V Models & Applications: Models of Consumer Behavious, Nicosia Model, Howard Sheth Model, Engle Balckwil Jullat Model, Industrial Buying Behaviour, Consumer Studies in India.

Suggested Readings:

- Sehiffman, L>G< and Kanuk, LL – Copnsumer Behaviour New Delhi, PHI 1994.
- Mowen John C. – Consumer Berhaviour, New York, Mac Millan 1993.
- Engle JF etc. Copnsumer Behaviour in Marketing, Engle wood Cliffts, New Jersey, PHI

The list of cases and specific references including recent articles will be announced in the class at the time of launching of the course.

HOSPITATLITY MANAGEMENT

Semester – III

304 : ETHICAL, LEGAL AND REGULATORY ASPECTS OF TOURISM

Objective: The basic objective of this course understanding the ethical legal and regulatory aspect of tourism.

Unit 1: Principles and practices in Business Ethics.
Business Compulsions, Motivations and Ethical parameters.

Unit 2: Specific Acts and Provisions: Citicenship Act. Passport Act. Foreigners Foreigners Registration Act and Customs Act.

Unit 3: Foreigon Exchange Management Act- 1999. Motor Vehicles Act and Pollution Control Act, Wild life protection act 1972.

Unit 4: Need of Central Tourism Legislation in India. Measures of Safety and Security of Tourists.

Unit 5: Regulatory Role of the Department of Tourism.

Suggested Reading::

- J.S. Desai, Ethical aspects in India, Vikash Publications.
- Negi, Tourism Ethics, Mac Graw Hill, New Delhi
- Bare Acts.

Semester – III

305 : HOTEL ACCOUNTING

Theme & Topics

Nature Scope and Tools of Management Account

Unit – I Management Information System and its relationship with accounting. The role of Management Accountant in the organisation. Various terminology of cost accounting. Budgeting and Budgetary Control.

Unit – II Budgeting and profit planning. Various types of budgets and their preparation Preparation of Flexible budget and Master Budget. Budgetary Control –meaning uses and limitations.

Unit – III Responsibility Accounting

Management Reporting System, Relevant cost and decision marking. Cost accounting for price determination. Value added accounting and social Accounting.

Semester – III

306 : Foreign Language Course (French)

OR

306 : Foreign Language Course (German)

OR

306 : Foreign Language Course (Japanese)

- Themes & Topics
- Alpha Beta, Different Sounds in Language, Modified Sounds/Compound Sounds.
- Basic Sounds in the Language, Counting Numbers, Days of the week, Months.
- Time (How to read time), Weather Conditions, Telephone Utilisation, Conversation-Introduction.
- Books, Newpapers, Magazines, Cigarettes, Match Box, Shopping facilities.
- Familiarisation with class room, items available in the room.
- Air Port, Air Lines, Customs, Immigration, Taxi Services, City Buses, Luggage directions Security Check Indications.
- Hotel/Motels/Guest/Houses – Type of Accommodation Available.
- Conversation between Receptionist and customer at Reception in the Hotel (Facilities available in the Hotel)
- Food Items – dishes – Tasty, Spicy, Chinese, Japanese, Indian, Continental
- Greetings
- Places of interest in Delhi and most important Tourist Places in India.
- Fair Structure – Charges Currency, Rupees, Coins.
- Singular – Plural, Masculine – Feminine, TV Set, VCR, Radio etc.
- Travel Agency/Tour Operator/Water Sorts/Adventure Sports/Lakshadweep Bhuddhist Circuits/etc.
- Interrogation?
  - Are You .....
  - Where do you stay ?
  - What is your name ?
- Chruch, Mosque, Temple and other Religious Places, Tea, Coffee, Juices, Soft drinks and other drinks.
- Vocabulary (Present-Past-Negative-Negative Past) 500 common use words. Adjectives in present & Past Tense.
- Expression Beauty, Dances, Dresses, Costumers Family Life, Marriages past Tense. Conjugations – Verb and Adjectives.
- Yoga-Naturopathy, Massage, Mediation, Beach Resort Facilities.
- Polices Station, Railway Station, Bus Stand, Mode of Conveyance.
- (A few songs – To be produced at the valedictory function) – by Participants
- Use of Present, Past & Future tense.
- Simple translation from and to English
- Making sentences & writing simple essays.
- Positive, negative and interrogative sentences.
- Letter writing – Business, Personal Letters.
- Writing of Application – Job, Leave, Complaints etc.

Semester – III

307 : JOB TRAINING REPORT

Semester – III

308 : VIVA-VOCE

(COMPREHENSIVE)

Semester – IV

401 : STRATEGIC MANAGEMENT

Semester – IV

402 : HERITAGE MANAGEMENT

OR

RURAL TOURISM

Objective : This module is important to study because of India is rich in heritage properties and its maintenance is necessary. This will help to understand the nature of heritage properties and conservation.

Unit – I **Indian Culture** : General Features, Sources, Components and Evolution.

Unit – II What is Heritage? Meaning and concept. Criterions for selection as heritage sites, monuments and zone by UNESCO (WHC). Types of heritage property. World famous heritage sites and monument in India and abroad.

Unit – III Heritage Management, objectives and strategies, Protection, Conservation and Preservation, Case study of one destination. Heritage Marketing, Destination development.

Unit – IV National and International Organisations engaged in Heritage Management (UNESCO, ICOMOS, ASI, INTACH and NGOs),

Unit – V Museums, Concept and classification. (National Museum, New Delhi; Bharat Kala Bhawan, Varanasi; Archaeological Museum, Sarnath, etc.) Heritage Hotels and its classification.

Suggested Readings :

- Allchin, B., Allchin, F.R. et al. (1989) Conservation of Indian Heritage, Cosmo Publishers, New Delhi.
- New Inskeep, Edward, Tourism Planning: An Integrated and Sustainable Development Approach (1991) VNR, New York.
- Ashworth, G.J. (2000), The Tourist Historic City. Retrospect and Prospect of Managing the Heritage City, Pergamon, Oxford

UNESCO-IUCN (1992) Eds. Masterworks of Man and Nature, Pantoga, Australia.

Semester – IV

403 : TOUR OPERATIONS MANAGEMENT

Objectives : The students will set practical knowledge relating to travel and tour operation.

Course Contents:

Unit- I Preparing for Work in Travel Operation: Appearance of Staff, Working area, Agencies internal environment, Checklist for display area, Health and safety at work; Stationary, Printing and office supplies, Filing system in Travel Agency: Materials for Filing Retrieving information, types of files e.g. correspondence files, Client files, Computer and Data bases, Effective communication in Travel Agency: Use of Telephone, Use of Telelx & Fax ,special Handling of business correspondence, Method of Taking Care of Customers.

Unit-II **Domestic Counter**: Service provided by Domestic counter: Tickets (Air & Railways), Car Hire and Surface Transport: Agencies for Domestic Car Hire/Surface Transportation: Their terms and Condition, Procedure for reservation; documents required, Billing and payment procedure, Commission Structure, Problems faced by clients with Domestic Airlines Railways, Hotels, Car rental, Any other.

Unit-III International Travel Counter; Services provided by International Counter; Government rules on International Travels. Reservation procedure for International and other travel related Vouchers like MCO, PTA, PSR etc, Procedure for lost ticket, Refund and Cancellation charges.

Unit- IV Places of Tourist interest in various destinations in India, Types of accommodation available, Modes of transportation and length of stay. Concept of Tour Itinerary and Preparation of sample itineary with the timings and mode of Air/train or by surface and details of sightseeing, types of Accommodations and other services.

Unit-V Procedure for Domestic and International Hotel Reservations. Documentation related with Hotel Reservation/Configuration/Cancellation, Preparation of Hotel and Other Service Vouchers, Procedure and documents involved in informing Sub-Agents for services; Procedure of checking and passing the bills of the transport/hotels and Guide/escorts. RBI guidelines/Rules regarding the foreign exchange transactions.

Suggested Readings :

- Chand, M., Travel Agency Management: An Introductory Text
- Seth, P.N., Successful Tourism Management
- Travel operation : South Asia Integrated Tourism Human Resource
- Development Programme (SAITHRDP)
- Tour Guiding : SAITHRDP.

Semester – IV

404 : ECO TOURISM

Semester – IV

405 : TOURISM GEOGRAPHY

Semester – IV

406 : ADVETISING MANAGEMENT

OR

RETAIL MANAGEMENT

Semester – IV

407 : DISSERTATION

- Tourism, Environment and Ecology.
- Cultural Tourism
- Adventure Tourism and Wild life Tourism
- Travel Management
- Hotel Management

Semester – IV

408 : VIVA-VOCE

(COMPREHENSIVE)

MBA

(INDUSTRIAL RELATIONS & PERSONNEL MANAGEMENT)
FULL TIME FOUR SEMESTER PROGRAMME

CHOICE BASED CREDIT SYSTEM (CBCS)

AS PER ORDINANCE 14, APPROVED BY CO-ORDINATION COMMITTEE

SYLLABUS FOR MBA (IR & PM) Semester – I & II 2020 – 2021 onwards
SYLLABUS FOR MBA (IR & PM) Semester – III & IV 2021 – 2022 onwards

PROGRAMME OBJECTIVES & STRUCTURE

Programme Objectives (POs) :

The MBA (IR & PM) Programme Structure is divided into four semesters spread over two years. The courses are classified as Core Courses, Discipline Centric Electives and Generic Elective Courses. The programme structure has been designed systematically and divided into four semesters. Semester I has Core Courses focusing on Management Concepts, Organisational Behaviour & Industrial Psychology, Statistical Techniques & Research Methodology & Personnel Management to develop multi-disciplinary foundation and to build a holistic approach among the participants, while a core course on Business Communication has been offered for skill development. Semester II has core courses on HRM & TQM, Industrial Law, Managerial Economics & Business Environment and Management of Trade Unions. A course on Computer Application has been offered for skill development. Behaviour Lab is a unique feature of the programme which has been introduced to orient the students with ways of solving practical problems related to human behaviour in an organization. In Semester III, a course on Business Legislation is included to acquaint students with laws related to basic business operations. A course each on Training & Development and Knowledge Management & Business Ethics have been placed for better understanding of Human Resource Management. In Semester IV, courses on Industrial Relations, Industrial Laws and Strategic Management have been included better understanding of the Industrial Environment and to Integrate Knowledge. Semester III & IV also offers Discipline Centric

Elective Courses on Applied Management, Employee Counseling, HRM in Global Environment and Safety & Service Management to facilitate choice based learning of the students. One Generic Elective Courses on Labour Welfare & QWL, Labour Costing & Compensation Management, Labour Management and Management of Organisational Change & Development respectively have been introduced in each semester to acquaint the students with labour and employees related issues. Summer Internship Dissertation and Comprehensive Viva Voce are included in the programme structure to assess students' skills to implement the learned concepts into practice and test their comprehension ability.

Programme Specific Objectives:

The human resource is considered to be an important competitive factor in any organized activity. The function of managing the personnel has become highly professional in the context of intricacies of new technology and widening markets. The main objectives of MBA (IR & PM) Programme are:

1. To provide knowledge of basic concepts and techniques essential to understand the basics of Personnel Management.
2. To develop basic skills required by the managers for maintaining good Industrial Relations and Personnel Functions of a professional organisation.
3. To create abilities to take and execute practical decisions related to labour management.
4. To instill the Human Relations approach in managing the activities of an organisation.

Course Structure MBA (I.R. & P.M.)

		Distribution of Marks			
SEMESTER I	**Course Type**	**Theory Paper**	**Internal Ass.**	**Maximum Marks**	**Credits**
Course Code & Name					
1.1 Principles and Practices of Mgmt.	CC	60	40	100	4
1.2 Organizational Behaviour and Industrial Psychology	CC	60	40	100	4
1.3 Research Methodology and Statistical Techniques	CC	60	40	100	4
1.4 Business Communication	CC	60	40	100	4
1.5 Personnel Mangement	CC	60	40	100	4
1.6* Labour Welfare and Quality of work life	**G E**	60	40	100	4
1.7 Comprehensive Viva Voce	CC			100	4
SEMESTER TOTAL				**700**	**28**
		Distribution of Marks			
SEMESTER II	**Course Type**	**Theory Paper**	**Internal Ass.**	**Maximum Marks**	**Credits**
Course Code & Name					
2.1 Human Resource Management & Total Quality Management	CC	60	40	100	4
2.2 Computer Application	CC	60	40	100	4
2.3 Industrial Law – I	CC	60	40	100	4
2.4 Managerial Economics & Business Environment	CC	60	40	100	4
2.5 Management of Trade Union	CC	60	40	100	4
2.6***** Labour Costing & Compensation Management	**G E**	60	40	100	4
2.7 Behavioural Lab Project & Viva Voce	CC	80	20	100	4
SEMESTER TOTAL				**700**	**28**
		Distribution of Marks			
SEMESTER III	**Course Type**	**Theory Paper**	**Internal Ass.**	**Maximum Marks**	**Credits**
Course Code & Name					
3.1 Business Legislation	CC	60	40	100	4
3.2 Training & Development	CC	60	40	100	4
3.3 Knowledge Management & Business Ethics	CC	60	40	100	4
3.4****** Applied Management **(A)** & Employee Counselling **(B)**	**D C E (A or B)**	60	40	100	4
3.5***** Labour Management	**G E**	60	40	100	4
3.6 Summer Internship Dissertation & Viva Voca	CC			100	8
SEMESTER TOTAL				**600**	**28**
		Distribution of Marks			
SEMESTER IV	**Course Type**	**Theory Paper**	**Internal Ass.**	**Maximum Marks**	**Credits**
Course Code & Name					
4.1 Industrial Relations	CC	60	40	100	4
4.2 Strategic Management	CC	60	40	100	4
4.3 Industrial Law – III	CC	60	40	100	4
4.4****** Human Resource Management in International Global Environment **(A)** & Safety and Service Management **(B)**.	**D C E (A or B)**	60	40	100	4
4.5* Management of Organizational Change & Development	**G E**	60	40	100	4
4.6 Comprehensive Viva Voce	CC			100	4
SEMESTER TOTAL				**600**	**24**

CC : Core Course GE : Generic Elective DCE : Discipline Centric Elective

* Students may choose this course as a Generic Elective **(GE)** or may choose a Generic Elective course offered by other UTDs or may choose a course offered by MOOCs through SWAYAM.

* The students are required to choose any one Discipline Centric Elective **(DCE)** course (A or B).

CREDIT DISTRIBUTION

SEMESTER	CORE COURSES	ELECTIVE COURSES		COMPREHENSIVE VIVA / DISSERTATION	TOTAL CREDITS
		GENERIC	DISCIPLINE CENTRIC		
SEMESTER I	20	04	00	04	28
SEMESTER II	20	04	00	04	28
SEMESTER III	12	04	04	08	28
SEMESTER IV	12	04	04	04	24
Total	**64**	**16**	**08**	**20**	**108**

SCHEME OF EXAMINAION

1- Semester End Theory Paper : Each theory paper of 60 marks will have following questions.

Type of Questions	Number of Questions	Marks allotted to each question	Total Marks
Short Answer Type	5	4	20
Long Answer Type	5	8	40

There will be two questions of each type from each UNIT in all the question papers.

2- Internal Assessment : The internal assessment of 40 marks shall be based on the two Written Tests of 20 marks each and one Test of 20 marks based on Assignment, Presentation & Class Participation of the student with following details. Marks will be awarded on the basis of best of the two Test Score.

Type of Assessment	Marks	Remarks
Class Test	20 Marks	Two assessments of 20 Marks Each on the basis of evaluation of Answer scripts of the student.
Assignment	05 Marks	Assessment based on Written Assignment submitted by the student within due date on the allotted topic.
Presentation	10 Marks	Assessment based on Oral Presentation given by the student within due date on the allotted topic.
Class Participation	05 Marks	Assessment based on attendance and active participation of the student in the class debates, discussions, quiz etc.

The University Teaching Department reserves all rights to make necessary changes in the above Internal Assessment valuation system in case of any contingencies.

Computation of Letter Grade, Grade Points, Credit Points, SGPA & CGPA

1- Grade Letter & Grade Points

The grade letter and grade points will be assigned as per the following table.

Letter Grade	Grade Points	Description	Range of Marks (%)
0	10	Outstanding	90-100
A+	9	Excellent	80-89
A	8	Very Good	70-79
B+	7	Good	60-69
B	6	Above Average	50-59
C	5	Average	40-49
P	4	Pass	35-39
F	0	Fail	00-35
Ab	0	Absent	Absent

2- Credit Points

The credit points will be computed by multiplying course credit with grading points in each course. Total Credit Points of the semester will be calculated by adding the credit points of all the courses of the concerned semester.

3- SGPA

Semester Grading Point Average will be calculated by dividing the total credit points of the semester by sum of credits allotted to that semester.

SGPA (Si) = $\sum(Cix \times Gi)/\sum CI$ (SGPI) will be expressed up to two decimal places by rounding off).

4- CGPA

Cumulative Grading Point Average will be calculated by taking the ratio of total credit points scored by the student and sum of total credits in all courses studied till the semester end. CGPA will be expressed up to two decimal places by rounding off.

An illustration of computing letter grade, grade points, credit points, SGPA & CGPA.

Course Code	Course Title	Credits	Grade	Grade Point	Credit Points (Credits × Grade Point)
1.1	Principles and Practices of Mgmt.	4	B+	7	4 × 7 = 28
1.2	Organizational Behaviour and Industrial Psychology	4	A	8	4 × 8 = 32
1.3	Research Methodology and Statistical Techniques	4	C	5	4 × 5 = 20
1.4	Business Communication	4	B+	7	4 × 7 = 28
1.5	Personnel Management	4	B+	7	4 × 7 = 28
1.6	* Labour Welfare and Quality of work life	4	B	6	4 × 6 = 24
1.7	Comprehensive Viva Voce	4	C	5	4 × 5 = 20
	Total Credit Points	28			180
Semester I		SGPA = 180/28 = 6.42			
Course Code	Course Title	Credits	Grade	Grade Point	Credit Points (Credits × Grade Point)
2.1	Human Resource Management & Total Quality Management	4	A	8	4 × 8 = 32
2.2	Computer Application	4	A	8	4 × 8 = 32
2.3	Industrial Law – I	4	B	6	4 × 6 = 24
2.4	Managerial Economics & Business Environment	4	B+	7	4 × 7 = 28
2.5	Management of Trade Union	4	A+	9	4 × 9 = 36
2.6	* Labour Costing & Compensation Management	4	B	6	4 × 6 = 24
2.7	Behavioural Lab Project & Viva Voce	4	B+	7	4 × 7 = 28
	Total Credit Points	28			204
Semester II		SGPA = 204/28 = 7.28			

	Semester I	Semester II	Semester II	Semester IV
Credit Points	180	204		
Credits	28	28		
SGPA	6.42	7.28		
CGPA	6.42	6.85		

Conversion of CGPA in to Percentage :

% = CGPA × 10%

Example

6.42 × 10 = 64.2

7.28 × 10 = 72.8

MBA

(INDUSTRIAL RELATIONS & PERSONNEL MANAGEMENT)

FULL TIME FOUR SEMESTER PROGRAMME

CHOICE BASED CREDIT SYSTEM (CBCS)

AS PER ORDINANCE 14, APPROVED BY CO-ORDINATION COMMITTEE

SYLLABUS

PROGRAMME STRUCTURE, SYLLABUS & SCHEME

(SESSION 2020-21 ONWARDS)

STUDY CENTRE FOR INDUSTRIAL RELATIONS & PERSONNEL MANAGEMENT

DEPARTMENT OF PSYCHOLOGY
A.P.S. UNIVERSITY, REWA (M.P.)

MBA (I.R. & P.M.)
SEMESTER – I
CC 1.1 : Principles and Practices of Management

Course Credit : 4
Max Marks – 60
Minimum Pass Marks : 21 (35%)

Objective - To acquaint students with the managerial knowledge & skills and to enhance their abilities that are essential for success in management career.

Course Contents :

Unit – I Basic concepts of management, role, responsibility & importance of management in modern society, distinction between management and administration, functions of management, Principles of management, History of management thought (Classical School, Neo-classical school and modern school)

Unit – II Planning : Nature, process, types, principles and significance, Planning vs Forecasting, Objective : Meaning, types, MBO : Process & significance, Decision Making : Meaning, principles, significance and process.

Unit – III Organizing : Nature, concept and process of organizing organizational structure, Delegation of Authority : meaning principles and advantages.

Unit – IV Direction : Meaning, elements of directing, principles and techniques of directing, Leadership : Meaning, Importance & Styles, Qualities of a good leader, Motivation : Meaning and Significance.

Unit – V Co-ordination : Nature, importance, principles and techniques of co-ordination.

Controlling : Meaning, Principles, process and prerequisite of effective control.

Outcome - The students will be able to get domain knowledge of the subject to build a strong foundation.

Books Recommended :

1- Principles & Practices of Management – Saxena
2- Management – Stoner.
3- Principles and Practice of Management – Shejwalkar P. C. & Ghanekar A. A.
4- Principles of Function of Management – Jain, J. K.
5- Principles of Management – Agrawal, R. D.
6- P. P. M. – Chabra, T. N.

MBA (I.R. & P.M.)
SEMESTER – I
CC 1.2 : Organizational Behaviour & Industrial Psychology

Course Credit : 4
Max Marks – 60
Minimum Pass Marks : 21 (35%)

Objective – To study human behaviour and to suggest various ways and means to improve the efficiency of workers in industries.

Course Contents :

Unit – I Organizational behaviour : Definition, Importance of studying organizational behaviour in industry, Scope of industrial psychology in an organization, Different models of organizational behaviour i.e. Autocratic Custodial, Supportive, Collegial.

Unit – II Motivation : Concept of motivation, motivation and behaviour, theories of motivation, MC Clelleland's Theory, Douglas, MC Gregors Theory, Maslow's and Herzbergs Models. Alderferls (ERG) theory, Important elements of sound motivational system.

Unit – III Leadership : Definition & concept, Leadership theories : Fielder's contingency model, Black and mounton's managerial Grid, Path and Goal theory, Linkert's management system.

Unit – IV Definition of monotony, fatigue, causes of fatigue, monotony, Concept of stress, Effect of stress and stress management.

Unit – V Organizational conflict : Concept, types of conflict, causes of conflict and approaches to resolve conflict.

Group Dynamics : Types of Group, Behavioural model and Techniques, process of group formation.

Outcome – The student will be able to motivate themselves & to increase their ability to perform well.

Books Recommended :

1- Organizational behaviour –Prasad L. M.
2- Organizational behaviour – Stephen P. Robbins.
3- Organizational behaviour – Sekheran Uma
4- Organizational Theory at work – Keith & Davis.
5- Human Relations & Organizational Behaviour – Dwivedi R. S.

MBA (I.R. & P.M.)
SEMESTER – I
CC 1.3 : Research Methodology & Statistical Techniques

Course Credit : 4
Max Marks – 60
Minimum Pass Marks : 21 (35%)

Objective - The aim of this course is to equip the participant with the basic understanding of the research methodology and to provide an insight into the application of modern analytical tools and techniques for the purpose of management decision making.

Course Contents :

Unit – I Meaning of Objectives of Research, Types of Research, Social Research – Importance, scope and limitations in concept of personnel functions.

Unit – II Research Design – Problem formulation, Defining Hypothesis, Basic principles of experimental design, Sampling Design – Characteristics of a good sample design, Concepts of population, sample, sampling unit, sample size and methods of sampling.

Unit – III Methods of data collection – Primary data, Secondary data, Observation, surveys, questionnaire, interview, Measures of central tendency, Dispersion, Presentation of data by charts, graphs and diagrams.

Unit – IV Measurement and scaling techniques, Errors in measurement – tests of sound measurements, Scaling and scale construction techniques, Interpretation of data and Report Writing.

Unit – V Correlation and Regression, Testing of Hypothesis – Large sample and small sample tests, chi-square test and their types (simple, 2×2 fold chi-square in contingency tables) T –Test and Anova.

Outcome - This course will acquaint the participants with the basic of research before they go to the corporate world for their project study this will also cultivate critical thinking, analytical skills and problem solving skills in the participants.

Books Recommended :

1- Research Methodology – Kothari C. R.
2- Methodology and Techniques of Social Research – Bhandarkar, Wilkinson.
3- Introduction to Research Procedure in Social Science – Gopal M. H.
4- Statistical Method – Gupta S. P.

MBA (I.R. & P.M.)
SEMESTER – I
CC 1.4 : Business Communication

Course Credit : 4
Max Marks – 60
Minimum Pass Marks : 21 (35%)

Objective – The course is aimed at equipping the students with the necessary techniques and skills of communicating individually and in a group. Oral, written and non-verbal communication skills are considered important in accomplishing the organisational goals and maintaining harmony.

Course Contents :

Unit – I Meaning, Definition, Importance of Business Communication, Types : Verbal & Non-Verbal Communication, Process and Elements of Communication Principle of Communication and Channels of Communication.

Unit – II Communication Media, Network, Barrier's in effective communication, strategies for improving communication effectiveness.

Unit – III Drafting of various personnel communication – Memos, Notices, Circulars, Press conference, Trade fairs, Correspondence with Govt. Authorities, Principles of Public Speaking, Guide Lines for preparing a speech.

Unit – IV Function of Public Relation Department, Different forms of Business letter, Application, Enquiry Replies, Quotations, Sales letters, Committee, Group discussion, Conference, Essential feature of interview, Preparation of curriculum vitae, Do's and Don't Public Speaking.

Unit – V Report writing : Types, Techniques and Importance, Agenda and Minutes writing, Proposal writing.

Outcome - The participants of this course will be able to learn about the various aspects of verbal and non-verbal communication which will be extremely useful to them at the entry level in any professional organisation in the initial years of their career.

Books Recommended :

1- Business Communication – Rai & Rai
2- Effective Business Communication – Murphy
3- Business Communication – Sinha K. K.
4- Essentials of Business Communication – Pal R.
5- Business Correspondence and Report Writing – Mohan Sharma

MBA (I.R. & P.M.)
SEMESTER – I
CC 1.5 : Personnel Management

Course Credit : 4
Max Marks – 60
Minimum Pass Marks : 21 (35%)

Objective - To enhance the knowledge of personnel management and its application and to develop their professional skills in this area.

Course Contents :

Unit – I Personnel Management : Definition, Concept of personnel Management, objective, principles, Role of a personnel manager with special reference to personnel management only. Structure of personnel department, Difference between personnel administration and personnel management.

Unit – II Human Resource Planning : Definition, Scope, Need, Objective and methods Role of employment exchange, recruitment plan and selection of employees, Placement, orientation and induction programme

Unit – III Concept of promotion and promotion policy, Concept of transfer, Job analysis, Job enlargement, Job enrichment and Job rotation.

Unit – IV Recent Types of Techniques of H. R. M. and Human Resource Accounting (Record), Adult and Human Resource Information System (HRIS).

Unit – V Personnel policy and personnel objectives : Definition, Scope and Development, Need, Concept, Organization politics and human capital.

Outcome – The students will be able to examine current issues, trends ,practices and processes in personnel management.

Books Recommended :

1- Dynamic Personnel Administration – Rudrabaswvraj M. N.
2- Personnel / Human Resource Management – Decenzo David A. & Stephen P Robbins.
3- Personnel Management – Monnapa Arun & Saiydain Mirza S.
4- Personnel Management and IR – Nair N. G. & Nair Lata

MBA (I.R. & P.M.)
SEMESTER – I
GE 1.6 : * Labour Welfare and Quality of Work Life

Course Credit : 4
Max Marks – 60
Minimum Pass Marks : 21 (35%)

Objective - To understand the concept and requirement of the labour welfare and to see government efforts in this field.

Course Contents :

Unit – I Labour Welfare : History, Principle, concept, objectives and scope, Statutory provision of labour welfare.

Unit – II Role, Qualification, functions and appointment of labour welfare officer, Impact of industrialization on labour welfare.

Unit – III Labour Welfare Agencies : Role of Trade Union, Govt., Employer's, Municipalities and Social Agencies.

Unit – IV ILO : Aims, objectives, structure and functions of ILO social responsibilities of industries, impact of industrialization in developing economy, on pollution, urbanization, education, employment and health.

Unit – V Meaning and concept of quality of work life, Principles & strategies to Q. W. L., factor's that led to Q. W. L.

Outcome - The students will be able to explore the welfare measures provided by the government and the companies.

Books Recommended :

1- Human Resource & Personnel Management – Aswathappa K.

2- Aspects of Labour Welfare & Social Security – Sharma A. M.

3- Economics of Labour – Bhagaliwal T. N.

4- Labour Welfare, Trade Unionism and Industrial Relations – Punekar S. D.

MBA (I.R. & P.M.)
SEMESTER – II
CC 2.1 : Human Resource Management & Total Quality Management

Course Credit : 4
Max Marks – 60
Minimum Pass Marks : 21 (35%)

Objective – Ensuring availability of resources, easy aware to data and to create an understanding the various policies and practices of human resource management.

Course Contents :

Unit – I Human Resource Management v/s Personnel Management : feature, Objective, Function scope, Role and Responsibility of HRM, Challenges of HRM, Effect of Globalization of HRM.

Unit – II Performance Appraisal : Definition, Concept, Process and Techniques of performance appraisal, Career planning : Definition, Object, Elements and Benefits, Importance of Human Re-engineering.

Unit – III Wage and Salary Administration : Wage determination process and factors influencing wage and salary administration, Types of wage : Minimum wage, Fair wage, Living wage, Money and real wage, Method of wage Payment, Method of job evaluation and job satisfaction, Fringe benefit : objective & classification.

Unit – IV Kind of separation : Resignation, Discharge, Dismissal, Suspension, Retirement, Lay off, Golden hand shake, VRS.

Productivity : Meaning, Definition, Elements, Measurement, Factors affecting productivity and ways of improving productivity.

Unit – V TQM & HRM : Kaizen, HRM in Public sector, Incentive schemes : Meaning, Types.

Outcome – Students able to develop their skills & their usage to management.

Books Recommended :

1- Managing Human Resource – Dwivedi R. S.
2- Human Resource Management – Michael B. P.
3- Personnel Management – Bagaliwal T. N.
4- Personnel Management – Mamoriya C. B.
5- Personnel Management – Subba Rao P.
6- Dynamic Personal Administration – Rudrabasvraj M. N.

MBA (I.R. & P.M.)
SEMESTER – II
CC 2.2 : Computer Application

Course Credit : 4
Max Marks – 60
Minimum Pass Marks : 21 (35%)

Objective - The objective of this subject include developing knowledge of software and hardware system available in the industry among the employees with the special reference to the commercial data processing systems

Course Contents :

Unit – I Introduction : History, Characteristics, Generations, Types of computers, Component of computers.

Unit – II Input and output devices, Computer software and its types.

Unit – III Operating system : Need and meaning, Introduction to MS – DOS and simple internal and external commands, Flow charts meaning, advantage and preparation of simple flow charts.

Unit – IV Window : Introduction, components of windows screen, feature of windows : Programme manager and application, file manager and application, print manager and application accessories and control panel.

Unit – V MS Office : Introduction and office tools, computer network and internet impact of computer on society.

Outcome - Students able to understand the computer usage in the business organisation & how to analyse data and work on computer.

Books Recommended :

1- Computer Fundamental – Sinha P. K.

2- Windows – Taxali

3- PC Software made easy – Taxali

4- Fundamentals of computers – Rajaraman V.

MBA (I.R. & P.M.)
SEMESTER – II
CC 2.3 : Industrial Law – I

Course Credit : 4
Max Marks – 60
Minimum Pass Marks : 21 (35%)

Objective - To learn the laws relating to the industrial relations wage legislations, social security, industrial dispute etc.

Course Contents :

Unit – I Factory Act 1948 : Object, Scope, Definition, Inspecting staff and power's provision of health, Safety and welfare, Working hours employment of women and child labour.

Unit – II Minimum Wages 1948 : Objective, Definition, Fixation and Revision of wages, payment of minimum wages.

Payment of Wages Act 1936 : Objective, Definition regarding wages, Authorized deduction from wages, Amount of deduction offences & penalties.

Unit – III Workmen compensation Act 1923 : Definition, Object Scope, Types of disability and Amount of compensation.

Employee Provident Fund Act 1952 : Object, Scope, Employees provident fund scheme.

Equal Remuneration Act 1976 : Object, Scope, Definitions and Important provisions of the Act.

Unit – IV Industrial Dispute Act 1947 : Object, Scope and Definitions, Concepts of strike, Lock-out, Lay-off and Retrenchment, Machinery for settlement of Industrial dispute.

Unit – V Payment of Gratuity Act 1972 : Object, Scope, Calculation of Gratuity, Mode of payment.

Bonus Act 1965 : Object, Scope, Definition, Calculation of Bonus, (Set on set off)

Outcome – The graduates will be acquainted with appropriate ways to analyse and determine wage and salary, settlement of dispute and benefits that employees receive in the organisation.

Books Recommended :

1- Industrial Relation – Chabra T. N.
2- Mercantile Law – Garg & Chawala
3- Labour Law – Kapoor N. D.
4- Labour Law – Taxman

MBA (I.R. & P.M.)
SEMESTER – II
CC 2.4 : Managerial Economics and Business Environment

Course Credit : 4
Max Marks – 60
Minimum Pass Marks : 21 (35%)

Objective – The objective of this course is to develop the ability to apply the concepts tools and technique of economics in analysing and interpreting business decision and to understand various environmental issues related with business

Course Contents :

Unit – I Introduction of Managerial Economics : Meaning, Scope, Nature, Importance, Role and Responsibility of managerial Economics, Demand and supply : Meaning Definition, Concept & Significance.

Unit – II Meaning and Phase of Business cycle, Govt. role in private business, Determinants of economic growth, Industrial policy in India, Growth and role of Small Scale Industries in Indian Economy.

Unit – III Taxes : Direct and Indirect taxes, New economic policy, Monetary policy, Meaning, Scope, Quantitative and Qualitative measures of monetary control.

Unit – IV Business Environment : Concept and Nature of Technological, Political, Economic, Social, Cultural and Natural Environment, Important provisions of constitution of India affecting business.

Unit – V Equal Employment Opportunity (EEO), Globalization : Meaning, Process and Purpose of globalization.

WTO : Structure, India's commitments to WTO.

GATT : Concept and Impact.

Outcome - The graduates of this course will be able to learn about the role of economics in business management and learn about the macro factor affecting business environment and will be well acquainted with the latest changes in the different components of business environment.

Books Recommended :

1- Business Environment – Aswasthappa K.
2- India Economy – Agarwal A. N.
3- Indian Economy – Dutta and Sunderam
4- Managerial Economics – Mehta P. L.
5- Managerial Economics – Sinha V. C.
6- Managerial Economics – Chopra O. P.
7- Business Economics – Adhikari M.

MBA (I.R. & P.M.)
SEMESTER – II
CC 2.5 : Management of trade Union

Course Credit : 4
Max Marks – 60
Minimum Pass Marks : 21 (35%)

Objective - To be able to understand the role, its different functioning and impact of trade unions in industries.

Course Contents :

Unit – I Trade Union : Concept, Types, Theories rise and growth of Trade Unionism, Union leadership : Problems of leadership, inter and intra union rivalry.

Unit – II Labour Movement : Meaning, Concept and Impact of Globalization and Liberalisation on labour union movement, Changes after new economic reforms 1991.

Unit – III Trade Union Act 1926 : Object, Scope, Definition, Registration, Rules of trade union and cancellation, Appeal, Dissolution and Amalgamation of trade union, Offences and Penalties under act.

Unit – IV Role, Status and Function of trade union in present scenario, Difficulties and defects of Indian Trade Unionism.

Unit – V Labour Management Co-operation and Code of discipline Recommendations of National Commission of Labour.

Outcome - The students will be able to understand Trade union and its importance in business.

Books Recommended :

1- Trade Union Movement in India – Mathur A. S. & Mathur J. S.

2- Industrial Relation – Sharma A. M.

3- Industrial Relation – Memoria C. B.

4- Labour Economics and Social Welfare – Dr. Tyagi B. P.

5- Labour Management Relation in India – Vaid K. N.

MBA (I.R. & P.M.)
SEMESTER – II
GE 2.6 : * Labour Costing & Compensation Management

Course Credit : 4
Max Marks – 60
Minimum Pass Marks : 21 (35%)

Objective - To understand the cost concepts and techniques that are applied in manufacturing and service organisations.

Course Contents :

Unit – I Nature and Significance of Cost Accounting : Introduction – Cost Accounting, Financial Accounting, Management Accounting, Difference between Cost and Financial Accounting, Management Accounting vs Cost Accounting, Advantages of Cost Accounting, Relationship of cost Department to other departments, Limitations of a cost system.

Unit – II Labour Cost Control : Introduction, Difference between Material Control and Labour Control, Labour Cost Control Factors, Labour Productivity, Labour Performance, Pricing of material issued – Cost price method – FIFO, LIFO, HIFO, Average price method, Market price method, Inflated price method.

Unit – III Labour Remunerating : Wage theories, Wage structure, Monetary and Non-Monetary incentives, Method of Remuneration – Time rate, Piece – Rate System (Taylor differential) Gantt Task Bonus Scheme, Emerson Efficiency Bonus Scheme, Bedaux Scheme, Accelerated Premium Schemes, Halsey Premium Schemes.

Unit – IV Budgetary Control : Introduction – Definition, Budget objectives, Budgetary control, Budget manual, Budget factor kind of budgets, Zero-base budget, Function – wise budget.

Unit – V Operating Costing: Introduction – Operating Cost, Transport Costing, Power House Costing, Canteen Costing, Canteen Cost Statement, Hotel Costing.

Outcome – The students will be able to understand various techniques available to measure labour productivity and able to motivate labour towards organisational goals.

Books Recommended :

1- Cost Accounting – Agrawal M. L.
2- Cost Accounting – Principles & Practices – Jawaharlal
3- Cost Accounting – Principles & Practices – Jain S. P.

MBA (I.R. & P.M.)
SEMESTER –II
CC 2.7 : Behavioural Lab Project & Viva-voce

Course Credit : 4
Max Marks – 60
Minimum Pass Marks : 21 (35%)

Objective - To enable students to understand various management aspects through different tests.

Course Contents :

1- Measurement of Intelligence.
2- Measurement of Personality.
3- Vocational Interest Bland (Record).
4- Occupational Stress Index.
5- Employees Motivation Schedule.
6- Measurement of Adjustment.
7- Measurement of Job Satisfaction.
8- Measurement of Anxiety.
9- Study of Organizational Climate.
10- Measurement of Moral.
11- Leadership Scale.
12- Appraisal Scale.
13- Measurement of Fatigue.
14- Personal Encouragement Scale.
15- Achievement Motive Scale.
16- Business Communication.
17- Managerial Practices.
18- Leadership Training.
19- Interpersonal Relations.
20- Computer Application in Management.
21- Communication Skill.

Any ten out of above.

Outcome - It enhance the knowledge and improve the understanding of the employees behaviour in the business.

MBA (I.R. & P.M.)
SEMESTER – III
CC 3.1 : Business Legislation

Course Credit : 4
Max Marks – 60
Minimum Pass Marks : 21 (35%)

Objective - It is designed to expose the students to the Indian legal system and its affect on business activities.

Course Contents :

Unit – I Company Law : Meaning, Characteristics of a company, Kinds of companies, Incorporation of a Company, Memorandum and Articles of association.

Unit – II Types of shares, Management, Meetings and Winding-up of Company.

Unit – III Consumer Protection act 1986 : Definition, consumer dispute redressal agencies, Procedure for making complaint, remedies available under the act and penalties.

Standing order act 1946 : Needs, Appeals, posting of standing orders, Duration and modification, powers of certifying officers.

Unit – IV Contract Law 1872 : Definition, essential of contract, kinds of contract, Formation of contract : Offer, Acceptance and consideration, Discharge of contract and its remedies, Partnership Act, 1932 : Definition, types, Rights and Duties of partner, Registration & Dissolution of Partnership firm.

Unit – V Negotiable Instrument Act 1881 : Meaning, Essential Ingredients, Special Characteristics of a Negotiable Instrument, Promissory notes, Bill of exchange and cheques, Dishonor and discharge of Negotiable Instrument.

Outcome – This course will prepare the participants for imaginative and responsible leadership roles in the business. They are expected to critically analyse, evaluate, create solutions in the business and increase understanding of the legal environment in the business sector.

Books Recommended :

1- Company Law – Singh Avtar
2- Mercantile Law – Garg and Chawla
3- Business Law for Managers – Tuteja S. K.
4- The Negotiable Instrument Act – Khergarmwala J. S.

MBA (I.R. & P.M.)
SEMESTER – III
CC 3.2 : Training and Development

Course Credit : 4
Max Marks – 60
Minimum Pass Marks : 21 (35%)

Objective - To acquaint the students with the training and development knowledge and to gain new knowledge or information that helps employees to do their job well.

Course Contents :

Unit – I Training : Meaning, Need for Training Objective, Assessment of Training Needs, Training contents, Principal of Learning and Training, areas of Training and Distinction between Training, Education and Development.

Unit – II Training Programme : Delivering the training programme, Arrival of the participants, Beginning an active programme, Making the training group functional, Empowering the group, delivering the programme.

Unit – III Training Methods : Types, Procedure, Contribution of training, Selection of trainees, Functions and Competencies of a trainer.

Unit – IV Development : Meaning, Objectives, Essential of Development programme, Techniques of management development programme, Concept of Executive / Management development, Factors for selection of Training and Development method.

Unit – V System Approach : Concept, Components, Need, Appropriate Management Training System Design (AMTS), Assumption of appropriate training system.

Outcome - To trained employees that helps to do their job well.

Books Recommended :

1- HRD – Tripathi P. C.

2- HRM – Rao Subba

3- Personnel Management – Bhagoliwal T. N.

4- System approach to Training and Development – Sah A. K.

MBA (I.R. & P.M.)
SEMESTER – III
CC 3.3 : Knowledge Management & Business Ethics

Course Credit : 4
Max Marks – 60
Minimum Pass Marks : 21 (35%)

Objective - To make students realise the importance of capturing knowledge elements and its structure, applications as a competitive advantage to business and to understand the concept of business ethics in business.

Course Contents :

Unit – I Knowledge Management : Evolution, Meaning, Definition, K.M. : Why now, Organizational Knowledge Management : The need, Approaches, Core issues, Need to be taken in the account in order to develop and deploy KM System, organizational KM components and functions.

Unit – II Basic types of knowledge, Organizational knowledge : Types, Classification, Knowledge life cycle, organisational knowledge : Sources and process.

Unit – III Generating new knowledge : Mentoring, situated learning, complexity at work and learning to be knowledge productive, learning in an unstable environment, learning in a complex environment, what if complexity is not accepted as normal? Facilitating knowledge productivity, developing awareness.

Unit – IV Business Ethics : Introduction, Meaning, Nature, Importance of managerial ethics, Determinants, tools, Ethical issues faced by managers.

Unit – V Management of Public Sector Undertakings : Meaning, Features, Objectives, Types, Autonomy and public accountability, control over public undertakings, Evaluation of performance of public sector undertaking in India, Drawbaks of public sector undertakings suggestions for improvement.

Outcome - The students will be able to understand that knowledge management and business ethics are key ingredients in an organisation's ability.

Books Recommended :

1- Principles and functions of management – Jain J. K.
2- Knowledge management & organisational design – Pauls, Myers
3- Knowledge management – Sudhir warier, Vikas publishing
4- Beyond Knowledge management – Bob Garvey & Bill Willianson. Financial Times / Prentice Hall

MBA (I.R. & P.M.)
SEMESTER – III
DCE 3.4 A : ** Applied Management

Course Credit : 4
Max Marks – 60
Minimum Pass Marks : 21 (35%)

Objective - To help the students to get aware towards different fields of management.

Course Contents :

Unit – I Marketing Management : Definition, Concepts, Process, Marketing mix elements, Market Segmentation, Marketing Environment, product life cycle, Marketing v/s Selling.

Unit – II Marketing Strategies : Product strategies, Pricing strategies, Distribution Management and Promotion Strategies, International Marketing, Rural Marketing, Internet Marketing.

Unit – III Service marketing, Marketing mix of services, Difference between service marketing and product marketing, Consumer behaviour.

Unit – IV Finance : Meaning and Objectives, Financial functions of the Manager, Needs of Working Capital and its Determinants.

Production : Concept and Function of Production Management, Types of Production System, Classification and Function of Inventories.

Unit – V MIS : Meaning and role of MIS, Classification of MIS, Information system for decision making, System approach and application of system to organisation.

Outcome – The students will be able to understand different fields of management like Marketing Finance, MIS & Production.

Books Recommended :

1- Fundamentals Management – Agrawal R. D.

2- Marketing Management – Kotler Philip.

3- Windows – Khanna O. P.

4- Information System for Modern Management – Merdick & James.

5- Marketing Management – Sontaki

6- Personnel Management – Bhagoliwal T. N.

MBA (I.R. & P.M.)
Semester – III
DCE 3.4 B : ** Employee Counseling

Course Credit : 4
Max Marks – 60
Minimum Pass Marks : 21 (35%)

Objective - To help employees to improve their mental health and develop self confidence.

Course Contents :

Unit – I Nature and concept of counseling, Need of employee counseling, Fields of application, Employee counseling by Personnel Managers.

Unit – II Psychoanalytic Theory and Employee Counseling : The topographical and Psychodynamic aspects of human mind, Conflicts, Need for counseling, Counseling procedure, Emotional Reeducation.

Unit – III Person Centred Therapy and Employee Counseling : Conception of man, Actualizing tendency, Development of self concept, Counseling procedure.

Unit – IV Behavioural Counseling : The development of behavioural counseling, Behavioural therapy, Criteria for counseling goals, Strategies : Systematic Desensitization, Social modeling, Assertive training, Aversion theraphy, Cognitive behaviour modification.

Unit – V Professional counseling for employees : Need and significance, Transactional analysis and professional counseling of employees, Directive and non-directive approaches, Reality therapy, Rational emotive therapy, Gestalt counseling and eclectic counseling.

Outcome - Students able to understand self control and how to work effectively in the industries.

Books Recommended :

1- Employee Counseling – Sinha A. K. P., Prachi Pub. & Dist. Pvt. Ltd. New Delhi, 1930
2- Counseling for Career Development – Tolbert E. L. New York, McGraw Hill.
3- Introduction to Counseling – Tolbert E. L. New York, McGraw Hill.

MBA (I.R. & P.M.)
SEMESTER – III
GE 3.5 : * Labour Management

Course Credit : 4
Max Marks – 60
Minimum Pass Marks : 21 (35%)

Objective - To minimise exploitation of workers and provide them maximum facilities for more Turnover.

Course Contents :

Unit – I Evolution of the Labour Problem, Labour Problems in Developing Economy, Labour migration & Labour market, Supply and Demand of Labour in India, Employment of workers in Organized and Unorganized Sector.

Unit – II Unemployment : Meaning and kinds of Unemployment, Causes and Effects of Unemployment, Measures to Reduce, Unemployment, Recommendation of I.L.O. on Unemployment.

Unit – III Rationalization and Automation : Definition, Aim and Objects, Advantages, Concept and Characteristics of Rationalization and Automation, Attitudes of Employers and Employees towards Rationalization and Automation.

Unit – IV Absenteeism : Concept, Effect, Causes, Types and Prevention of Absenteeism.

Labour Turnover : Meaning, measurement of Labour turnover, Effect, Causes and Methods to Reduce Labour Turnover.

Unit – V National Labour Policy : Scope, Aim, Objectives and Five Year Plans.

Empowerment : Introduction, Concept, Factors and Barriers of Empowerment.

Outcome - To improve productivity and minimise rate of absenteeism in the industry.

Books Recommended :

1- Labour Economics and Social Welfare – Dr. Tyagi B. P.

2- Personnel Management and Industrial Relations – Bhogoliwal T. N. (1996) Sahitya Bhavan Agra.

3- Labour Problems – Memoriya N. (1996).

4- Labour Problems and Social Welfare – Saxena R. C. (1996).

5- Personnel Management & I. R. – Nair N. G. & Nair Latha

MBA (I.R. & P.M.)
SEMESTER –III
CC 3.6 : Summer Internship Dissertation & Viva Voce

Course Credit : 8
Max Marks – 100
Minimum Pass Marks : 50 (50%)

A candidate has to undergo a field visit Industrial Training Programmes to submit a project report in Semester III of the course based on practical training in any subject relating to Personnel Management, HRD and Industrial Relations in a Business firm for a period of 4 to 6 weeks.

The work done under the project must indicate the analytical and critical ability of the candidate in relation to the problem, which he / she has identified during the period of the training.

Student will be required to submit a project report to the department for the work under taken during this period within 3 weeks of the commencement of the third semester for the purpose of evaluation in third semester.

The project work will carry 60 marks and viva for 40 marks. The report will be evaluated by one internal and external examiner.

MBA (I.R. & P.M.)
SEMESTER – IV
CC 4.1 : Industrial Relations

Course Credit : 4
Max Marks – 60
Minimum Pass Marks : 21 (35%)

Objectives – To provide better work environment with redressal of grieveness in the industries and apply the concept of industrial relations and the system in which it operates.

Course Contents :

Unit – I Introduction : Meaning, Definition, Concept and Scope, objective / Purpose and Elements of I.R.
Industrial Conflict & Disputes : Meaning, Types, Causes and Effect of industrial dispute.

Unit – II Major determinants of I.R., Grievance : Meaning, Concept, Nature, Source of Grievances, Grievances handling procedure, **Discipline :** Meaning & definition, Aspects of discipline, Importance disciplinary procedure, The Red Hot Stove Rule, Indiscipline and Types of Punishment.

Unit – III Conciliation Mediation : Necessity, Meaning and Procedures, Types and Limitations, Role of conciliation officer and Conciliation machinery.
Arbitration : Meaning, methods and Appointment of Arbitrator and Arbitration in India.

Unit – IV Negotiation and Collective Bargaining : Meaning, Purpose, Scope, Process, Function, Level, Procedure and Forms of Coll. Bargaining and Negotiation, Collective Bargaining in U. K.

Unit – V Worker's participation in Management : Meaning, Need, Concept, Objective and Determinants of WPM, WPM in India, WPM scheme of 1975 i.e. in Industry, in Public Sector and Barriers in Workers participation.

Outcome – Students would be aware of present state of industrial relations issues related to collective bargaining, worker's participation, dispute resolution in the organisation.

Books Recommended :

1- H.R.M. & I.R. – Subba Rao P.
2- Industrial Relation – Chabra T. N.
3- Personnel Management & Industrial Relation – Nair & Latha Nair
4- Industrial – Monappa Arun
5- Labour Economics & Social Welfare –Dr. Tyagi B. P.
6- Dynamics Industrial Relation – Memoria C. B.
7- HRM – Bhatia S. K.

MBA (I.R. & P.M.)
SEMESTER – IV
CC 4.2 : Strategic Management

Course Credit : 4
Max Marks – 60
Minimum Pass Marks : 21 (35%)

Objective - To understand the basic concepts, principles associated with strategy formulation and implementation.

Course Contents :

Unit – I Nature, Importance, Purpose and Objectives of Business Policy, process of strategic management, Components of strategic management : Mission, Policy, Purpose, Objective and Goal.

Unit – II Environmental appraisal : Internal, External, Micro and Macro environmental appraisal.

Environmental Scanning : Factors, Approaches, Sources, Method and Techniques for Environment Scanning.

Unit – III Strategic Alternative : Grand Strategies, Strategies for Modernisation, Diversification and Integration, Merger, Take over and Joint Venture, Turn around, Disinvestment, Liquidation and Combination Strategies.

Unit – IV Issue of Strategy Implementation, Project and procedural implementation structure for strategies, Functional plan and Policies, Financial plans and policies, Marketing plans and Policies, Operational and personnel plans and policies, Social Responsibility and strategic management.

Unit – V Nature and Importance of strategic evaluation, Participants and Barriers in in evaluation, Strategic and Operational control, Techniques of strategic evaluation and control, Role of organisational system in evaluation.

Outcome - The students will be able to understand the crucially important role of strategic management in the success of any organisation.

Books Recommended :

1- Business Policy – Kazmi Azhar

2- Business Policy – Ghosh P. K.

3- Business Policy – Cherunilum Francis

MBA (I.R. & P.M.)
SEMESTER – IV
CC 4.3 : Industrial Law – II

Course Credit : 4
Max Marks – 60
Minimum Pass Marks : 21 (35%)

Objective - To enhance the broad knowledge of business laws in management.

Course Contents :

Unit – I ESI Act 1948 : Definition, Object, Scope, Benefits under the act, Mines Act, 1952 : Definition, Object, Provision for health, Safety welfare and hours of work.

Unit – II Contract Labour Act 1972 : Scope, Definitions, Welfare and Health of contract labour.

Maternity Benefit Act 1961 : Important Provisions under the act.

Unit – III Employment Exchange Act (Compulsory Notification of Vacancies Act) 1959, Various provisions for notification of vacancies.

Apprentices Act 1962 : Definition object and general provisions of the act.

Unit – IV Essential Commodities Act, 1955 : Definition, Objective and Important Provisions and Punishment.

Child Labour Act, 1986 : Definition, Object, Scope, Important Provision of the act.

Unit – V IDRA 1951 : Object and Applicability, Definitions, Establishment of council, Regulation of scheduled industries, Powers of Central Government, Offence and Penalties.

Outcome - The Students will develop critical thinking and have ability to understand broadly industrial law which affecting the administration of an organisation.

Books Recommended :

1- Factories Act – Shrivastava K. D.

2- Handbook of Industrial Law, Lucknow, Eastern Book 1995 – Malik P. L.

3- Mercantile Law – Garg & Chawla.

4- Industrial Relation – Chabra T. H.

5- Labour Law – Taxman

MBA (I.R. & P.M.)
Semester – IV
DCE 4.4 A : ** Human Resource Management in International Global Environment

Course Credit : 4
Max Marks – 60
Minimum Pass Marks : 21 (35%)

Objective - To build a knowledge base of the contemporary practices and issues of HRM in International Global Environment.

Course Contents :

Unit – I Introduction of HRM : Meaning, Definition, Evolution, Difference in HRM & Personnel Management, Emerging challenger in HRM.

Unit – II Six Sigma : Making Six Sigma initiative – The quality mantra, Six Sigma process approach in HR, Gaining control, Six Sigma is more than cultural change and has challenges.

Unit – III International Human Resource Management : Domestic HRM and IHRM compared, growing internet in IHRM, Managing International HR activities.

Unit – IV The Competent Organization : The American model, Why American theories might not apply abroad, Parochialism and Universality, Management competences approach, Different degrees of Internationalization of companies.

Unit – V The Motivating Organization : The Japanese model – Corporate commitment, Task, Job, Career and organizational incentives, Features of Japanese Management.

Outcome - The students will be able to understand how different countries are dealing with HRM

Books Recommended :

1- HRM – S. K. Bhatia
2- HRM – K. Aswathappa
3- International HRM – Terence Jackson

MBA (I.R. & P.M.)
SEMESTER – IV
DCE 4.4 B : ** Safety and Service Management

Course Credit : 4
Max Marks – 60
Minimum Pass Marks : 21 (35%)

Objective - To interpret and apply legislative requirements and industry standards applied in Indian organisations.

Course Contents :

Unit – I Concept of Industrial Health and Safety : Basic facts and importance, Safety organisation, Basis of safety programme and policy, Remedial issues of safety, Industrial Health : Importance and provision under Factory Act 1948 as preventive measures.

Unit – II Occupational Safety and Health : Nature, Scope, Importance occupational hazards and Risks, Occupational Disease, Protection against health hazards, safety in ports and docks, Safety in mines and National safety council.

Unit – III Industrial Accident and Industrial Injury : Definition, Nature, Causes of accident, Cost of accidents, Accident report ad records, Steps for prevention of accident.

Unit – IV The Environment Protection Act 1986 : Object, Scope, Definition, General power's of the Central Govt. power to appoint officer's and their powers and functions, Power to make rules to regulate environmental pollution, Furnishing of information, Power of entry and inspection, to take sample, Environment laboratories offences by companies and Govt. Department.

Unit – V The Air and Water (Prevention and Control of Pollution) Act : Short title, Definition, Constitution, Function and power of Central and State Board, Funds, Accounts and Audit of the Board, Offences and Penalties under air (Prevention and control of pollution) act.

Outcome – Students able to understand various legislative requirements for (safety and service) which are applied in Indian organisations.

Books Recommended :

1- Human Resource Management – Dessler Gery
2- Industrial Relation and Personnel Management – Nair and Latha Nair
3- Guide to Environmental Laws in India – Jain P. C.
4- Mercantile Law – Garg and Chawala
5- Labour Economics & Social Welfare – Tyagi B. P.
6- Personnel Management – Memoria C. B.

MBA (I.R. & P.M.)
SEMESTER – IV
GE 4.5 : * Management of Organisational Change & Development

Course Credit : 4
Max Marks – 60
Minimum Pass Marks : 21 (35%)

Objectives – To execute strategy and speed awareness about change for betterment of an organisation.

Course Contents :

Unit – I Organisational Change : Concept, Types, Reasons, Responses to change, Principles, Evaluation and Implementation.

Unit – II Acceptance of change, pre-requisites of organisational change, Resistance to change and steps taken by management to overcome and strategies for change.

Unit – III Organisational Climate of Culture : Components, Determinants, Procedure to maintain types, Societal culture, HRD culture / climate.

Unit – IV Organisation Development and Effectiveness : Meaning, Definition, Characteristics, Nature, Objectives, OD, Change agents, Interventions, OD in Indian Industries and criticism of OD.

Unit – V Emerging Concepts of Kaizen, Bench marking, Quality consciousness, Learning organisations, Rensis Likers approach to understanding and evaluation of organisational effectiveness.

Outcome – Students able to understand field of innovation and how change works effectively.

Books Recommended :

1- HRD – Tripathi P. C.

2- HRM – Saiyadain Mirza

3- HRM – Subha Rao P.

M.A. ENGLISH

EXAMINATION SCHEME

Nomenclature of Paper **Distribution of Marks**

		Theory/External Assessment		Internal Assessment		Total Marks
Semester – I		**Max.**	**Min.**	**Max.**	**Min.**	
1	Poetry	80	29	20	10	100
2	Drama	80	29	20	10	100
3	Fiction	80	29	20	10	100
4	Prose	80	29	20	10	100
Semester – II						
1	Poetry	80	29	20	10	100
2	Drama	80	29	20	10	100
3	Fiction	80	29	20	10	100
4	Prose	80	29	20	10	100
Semester – III						
1	Critical Theory (Compulsory)	80	29	20	10	100
2	English Language Compulsory)	80	29	20	10	100
3	Indian Writings in English III (A) Optional	80	29	20	10	100
4	Commonwealth Literature in English III (B) (Optional)	80	29	20	10	100
5	American Literature IV (A) (Optional)	80	29	20	10	100
6	Linguistics and stylistics IV (B) (Optional)	80	29	20	10	100
Semester – IV						
1	Critical Theory (Compulsory)	80	29	20	10	100
2	English Language (Compulsory)	80	29	20	10	100
3	Indian Writing in English III (A) (Optional)	80	29	20	10	100
4	Commonwealth Literature in English III (B) (Optional)	80	29	20	10	100
5	American Literature IV (A) (Optional)	80	29	20	10	100
6	Linguistics and stylistics IV (B) (Optional)	80	29	20	10	100

Grand Total - 1600

Objective:

The growth of English language and literature over the centuries from a totally different state- more in the condition of a dialect in the earliest periods- to what it is in the present century should form the background knowledge of every student of English literature.

The objective of this course is to introduce the music and beauty of the English sounds and vocabulary of the earliest period in English literary history to the students to enable them to have a historical perspective of the developments over the centuries. The course also introduces the great masters of the early period such as Chaucer, Spencer Donne, Milton, Marlowe and Shakespeare.

Introduction of poetic forms, and different movements evaluation of the impact of Romanticism and Victorianism on the development of English literature, with emphasis on development of literary form and literary modes of expression and an understanding of concepts of gender and women during these periods have been included :

The task of inculcating a comparative awareness in the minds of the participants to realize its cultural significance in the globe as well as in states like India is central to the goal of this course. Inculcation of good teste in literature and human values is the aim of this course.

Department of Higher Education, Govt. of M.P.
Post Graduate Semester wise Syllabus
Session 2020-21
As Amended in the BOS meeting held on 21/09/2020

Class	- M.A. Previous
Subject	- English
Semester	- I
Course	- Poetry
Paper	- I
Marks	- 80 + 20 =100
	- Theory + Internal Assessment

Objective
The objective is to initiate the student into the realm of poetry. She should have knowledge and taste of basic genres of poetry. She should study excellent samples of all genres.

Note: 1. There shall be four Compulsory Papers in each semester. In all there will be eight compulsory papers in two semesters.

Unit- 1	Annotations (Any two out of four given passages. At least one to be selected at least one from each unit).
Unit-2	Epic Poetry John Milton: Paradise Lost Book I Valmiki: Ramayan (Sunder Kand)
Unit-3	Narrative Poetry Geoffrey Chaucer: The Prolouge to the Canterbury Tales S. T. Coleridge: Dejection: An Ode
Unit-4	Renaissance Poetry: William Shakespeare: Sonnets No. 23, 24, 26, 27, 31, 44 John Donne: The Good Morrow, Love's Alchemie, The Canonization, The Anniversarie.
Unit-5	Satarical Poetry: John Dryden: Absalom and Achitophel – Line 1 to Line 302 Alexender Pope: The Rape of Lock – (cantos 1 & 2)

Books Recommended:-

Emile Legouis	:	Chaucer
EMW TilLyard	:	Milton
Compton Rickett	:	History of English Literature
David Daiches	:	History of English Literature

Note: - The internal assessment will be based on a term paper written by the student and then its presentation

Outcome:
The student will have an in depth idea of English poetry and its different genres. This course will work as a foundation for understanding of poetry and its nuances

Department of Higher Education, Govt. of M.P.
Post Graduate Semester wise Syllabus
Session 2020-21
As Amended in the BOS meeting held on 21/09/2020

Class	- M.A Previous
Subject	- English Literature
Semester	- I
Course	- Drama
Paper	- II
Marks	- 80 + 20 =100
	- Theory + Internal Assessment

Objective

The objective is to explain the genre of drama to the student. As the foundation pillar of English literature, this paper talks about psychological nuances of English drama, Shakespearean drama and eras before and after it.

Note: 1	There shall be four Compulsory Papers in each semester. In all there will be eight compulsory papers in two semesters.
Unit-: 1.	Annotations (Any two out of four given passages selecting least one from each unit).
Unit 2.	Non-English Drama: Sophocles: Oedipus Rex Kalidas: AbhigyanaShankuntalam. (English Translation, Sahítya Academy)
Unit-3	Shakespearean Tragedy: Hamlet Othello
Unit 4:	Other Shakespearean Plays: As you Like It The Tempest
Unit- 5:	Renaissance Drama: (Non-Shakespearean) Christopher Marlowe: Dr. Faustus John Webster: Duchess of Malfi

Books Recomnended:

AC. Bradley	:	Shakespearean Tragedy.
H.B. Charlton	:	Shakespearean Comedy.
Ram Vilas Sharma	:	Shakespearean Tragedy.
AllardyceNicoll	:	British Drama

Note: - The internal assessment will be based on a term paper written by the student and then its presentation

Outcome:

The Student will have an understanding of the origin of English drama, Its deep psychological and literary value. The student will have a better understanding of life as such.

Department of Higher Education, Govt. of M.P.
Post Graduate Semester wise Syllabus
Session 2020-21
As Amended in the BOS meeting held on 21/09/2020

Class	- M.A. Previous
Subject	- English Literature
Semester	- I
Course	- Fiction
Paper	- III
Marks	- 80 + 20 =100
	- Theory + Internal Assessment

Objective

The objective is to explain the beginning of early fiction. This paper talks about Indian and British fiction. It explore the genre of the fiction. We have tried to pickup interesting novels of different ages so as to lure the student into the world of words.

Note: 1.	There shall be four Compulsory Papers in each semester. In all there will be eight compulsory papers in two semesters.
Unit- 1:	Early Prose Narrative
	Bana Bhatt: Kadambari
	Cervantes: Don Quixote
Unit-2	Picaresque Novel:
	Henry Fielding: Tom Jones
	Daniel Defoe: Robinson Crusoe
Unit-3	Historical Novel
	Walter Scott: Kenilworth
	W.M. Thackeray: Henry Esmond
Unit- 4	Fiction by Women:
	Jane Austen – Pride and Prijudice
	Charlotte Bronte: Jane Eyre
Unit-5	19thCentury Realistic Novel
	Charles Dickens: Great Expectations
	Zola: Nana

Book Recommended –

Walter Allen	: History of English Novel
David Daiches	: Critical Approaches to Literature
O.P. Budholia	: George Eliot: Art and Vision in Her Novels.
Austin Dobson	: Fielding
lan Watt	: The Rise of the Novel

Note: - The internal assessment will be based on a term paper written by the student and then its presentation

Outcome

The students learn the evolution of novels as a genre and discus its features. Students are asked to discuss early novel narrative techniques characteristion, plot and themes.

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Post Graduate Semester wise Syllabus
Session 2020-21
As Amended in the BOS meeting held on 21/09/2020

Class	- M.A. Previous
Subject	- English Literature
Semester	– I
Course	-Prose
Paper	- IV
Marks	- 80 + 20 =100
	- Theory + Internal Assessment

Objective

It helps students yet acquainted with the richness of literature through resprsentative works of biography, autobiography and essay. It also helps students to learn philospical writing, policatal and social writing in prose.

Note-1. There shall be four Compulsory Papers in each semester. In all there will be eight compulsory papers in two semesters.

Unit-1: Annotations (Any two out of four given passages selecting at least one from each unit).

Unit-2 Biography and Autobiography:
Gandhi – My Experiments with Truth (Chapter-1 and 2)
Kamala Das: My Story (Fourth Chapter).

Unit 3: Political and Social Writings:
Plato: The Republic, Book II (First four chapters).
Francis Bacon: of Truth, Of Studies, Of Revenge, of Love.

Unit-4 Philosophical Writings :J.Krishnamurti
1. Individual and Society
2. Action and Idea.
3. What is Self?
4. What are We Seeking?

Unit-5 Bertrand Russell: True Success,
William Hazlitt:
1. The lgnorance of the Learned
2. The Indian Jugglers.

Books Recommended

Hugh Walker : The English Essay and Essayists.
Benson : The Art of Essay Writing
J.Krishnamurti : The First and the Last Freedom

Note: - The internal assessment will be based on a term paper written by the student and then its presentation

Outcome

The students discuss the effect of essay writing and autobiography. This Paper gives the students an idea of logical flow of thought in literature through the genre of prose.

Department of Higher Education, Govt. of M.P.
Post Graduate Semester wise Syllabus
Session 2020-21
As Amended in the BOS meeting held on 21/09/2020

Class	- M.A. Previous
Subject	- English Literature
Semester	- II
Course	- Poetry
Paper Marks	- 80 + 20 =100
	- Theory + Internal Assessment

Objective

We expose learners to the changing trends in English poetry from pre-romantic to modern poetry. In this paper, we have pomes that touch modern, symbolic,victorian, and romantic poetry.

Note: 1 .Two essay type--questions to be set form each unit and one to be attempted
2. All questions are compulsory. They carry equal marks.

Unit 1: Pre Romantic Poetry:
Thomas Gray: The Bard, The Progress of Poesy.
William Blake: On Another Sorrow, From "Auguries of Innocence", The Poison Tree

Unit -2: Romantic Poetry:
W. Wordsworth: TinternAbbey ; Ode on Intimations of Immortality
P.B. Shelley: Adonais
John Keats: Ode on a Grecian Urn, Ode to Autumn.

Unit-3 Victorian Poetry
Alfred Tennyson: Ulysses, The Lotus Eaters
Matthew Arnold: Thyrsis, The Scholar Gypsy

Unit-4 Symbolist Poetry:
T.S. Eliot: The Waste Land
W.B. Yeats: The Second Coming;
Philip Larkin – Charch Gring

Unit-5 Modern Poetry
W.H. Auden: Strange Meeting, The Shield of Achilles.
Dylan Thomas: Fern Hill, A Refusal to Mourn the Death of a child.

Book Recommended:

Desmond King	: Helle: Shelley- His Thought And Work, Macmillan, London
Graham Hough	: The Last Romantics
Humphrey House	: Coleridge
C.M. Bowra	: The Romantic Imagination

Note: - The internal assessment will be based on a term paper written by the student and then its presentation

Outcome:

The students compare all genres of poetic form and discuss the glory of romantic poetry. They learn modern poetry and they also discuss the themes of modern poetry. It develops the students sense of understanding literature and poetry.

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Post Graduate Semester wise Syllabus
Session 2020-21
As Amended in the BOS meeting held on 21/09/2020

Class	- M.A. Previous
Subject	- English Literature
Semester	- II
Course	- Drama
Paper	- II
Marks	- 80 + 20 =100
	- Theory + Internal Assessment

Objective

This paper talks about different genres of drama.Students explore modern English drama.

Note: 1. Two essay type -questions to be set form each unit and one to be attempted
2. All questions are compulsory. They carry equal marks.

Unit- 1: Annotations : (Any two out of four given passages selecting at least one from each unit).

Unit-2: Restoration Drama:
John Dryden: All For Love
William Congreve: The Way of the World

Unit-3: Victorian Drama & Modern Drama
G.B. Shaw: Man and Superman
John Oborne – The Angry Young Man

Unit 4 Experimental Drama:
Henric Ibsen: A Doll's House
Bertolt Brecht: Mother Courage

Unit 5 Indian Drama
GirishKarnad: Tughlaq
Mahesh Dattani: Final Solution

Book Recommended:

Frederick Lumley : Trends in 20th Century Drama.
AllardyceNicoll : British Drama
Raymond Williams : Drama from Ibsen to Eliot
O.P. Budholia Critical Essays on Indian English Literature

Note: - The internal assessment will be based on a term paper written by the student and then its presentation

Outcome

Students get to know non Shakespearen drama and compare Shakespearen style to other styles and methods.

Department of Higher Education, Govt. of M.P.
Post Graduate Semester wise Syllabus
Session 2020-21
As Amended din the BOS meeting held on 21/09/2020

Class - M.A. Previous
Subject - English Literature
Semester - II
Course - Fiction
Paper Marks - 80 + 20 =100
- Theory + Internal Assessment

Objective

It introduces student's to the texts that reflect a range of historical, cultural and aesthetic values. The course also reflects aspects of instruction, entertainment, society, class and gender as perceived in the nineteenth century England. It also included a novel by Prem Chand.

Note: 1. There shall be four Compulsory Papers in each semester. In all there will be eight compulsory papers in two semesters.
2. Two essay type-questions to be set from each unit and one to be attempted.
3. All questions are compulsory. They carry equal marks.

Unit-1 19th Century Fiction:
Gustav Flaubert: Madarne Bovary
George Meredith: The Egoist

Unit-2: Rural Novel:
Thomas Hardy: Tess of the Durbervilles
MunshiPremchand: Godaan

Unit-3 Psychological Novel
Virginia Woolf: To the Light house
D.H.Lawrence: Sons and Lovers

Unit-4 Naturalist Novel:
Joseph Conrad: Lord Jim.
Earnest Hemingway: Old Man and the Sea

Unit-5 Post Naturalist Novel
William Golding: Lord of the Flies.
Saul Bellow: Herzog

Books Recommended :-

SisirChattopadhyaya: The Technique of the Modern English Novel.
A.S. Collins: English Literature of the 20" Century
Arnold Kettle: An Introduction to the English Novel.
David Daiches: The Novel and the Modern World.
Dorothy Van Ghent: The English Novel: Form and function
lan Watt: The Rise of the Novel.
SisirChatterjee: Problems in Modern English Fiction.
Katherine Lever: The English and the Reader
Wilbur L. Cross: The English Novel
David Cecil: Early Victorian Novelists.
S.S. Narula: Galsworthy and the English Novel.

Note: - The internal assessment will be based on a term paper written by the student and then its presentation.

Outcome

The outcome of the course is to initiate critical thinking on evaluation of various constructions of identity, such as age, class, religion and strata in society.

Department of Higher Education, Govt. of M.P.
Post Graduate Semester wise Syllabus
Session 2020-21
As Amended in the BOS meeting held on 21/09/2020

Class	- M.A. Previous
Subject	- English
Semester	- II
Course	- Prose
Paper	-IV
Marks	- 80 + 20 =100
	- Theory + Internal Assessment

Objective: The objective is to develop the taste of the student in English prose and give excellent reading material.

Note: 1. There shall be four Compulsory Papers in each semester. In all there will be eight compulsory papers in two semesters.
2. Two essay type-questions to be set from each unit and one to be attempted.
3. All questions are compulsory. They carry equal marks.

Objective:

The objective is to explane the begning of erly prose. This paper talks aboutimportan prose write. It is explore the main gener of prose.To familiarize the students with the important works of the age of Charls Lamb and Robert Lynd.

Unit- 1	Annotations (Any two out of four given passages. At least one to be selected at least one from each unit).
Unit-2	Boswell: The Life of Dr. Johnson (From Every man's Edition of Boswell's Life of Dr. Johnson London: J.M. Dent 1958 Vol. I, Intrductory PP 5-11. Addison :Choice of Hercules, Uses of the Spectators.
Unit -3	OliverGoldsmith:The Man in Black. Charles Lamb:New Year's Eve, A Bachelor's Complaint Against the Behaviourof Married People.
Unit_4	A.G. Gardiner: On the Rule of the Road, In Defence of Laziness. Robert Lynd: Back to the Desk; Forgetting; The Pleasures of Ignorance; I Tremble.to Think.
Unit-5	G.K. Chesterton: On Running aftre One's Hat, Patriotism and Sport. Hilaire Belloc: On Books, On preserving English

Books Recommended:-

R.P. Tiwari (ed)	: A.G. Gardiner: Selected Essays.
Stuart Hodgson	: A.G. Gardiner
G.S. Fraser	: The Modern Writer and His World.

Note: - The internal assessment will be based on a term paper written by the student and then its presentation.

Outcome:

The Students will have a better understanding of English prose. She will feel the naturalness of English Prose.

Department of Higher Education, Govt. of M.P.
Post Graduate Semester Wise Syllabus
Session 2020-21
As Amended in the BOS meeting held on 21/09/2020

Class	-	M.A.
Subject	-	English
Semester	-	III
Title of Subject of Group	-	Critical Theory
Paper	-	I
Compulsory/Optional	-	Compulsory
Max. Marks	-	80 + 20 =100
	-	Theory + Internal Assessment

Objective

The course aims at facilitating basic knowledge in English critical tradition from the beginning. As such it begins with an introduction to classical literary theory.

Particulars

Unit – 1	Natyashastra – Rasa Theory, Aristotle-Poetics (Butcher's Translation)
Unit – 2	Longinus – On the Sublime, Philip Sydney – Apology for Poetry.
Unit – 3	John Dryden : An Essay on Dramatic Poesy, Dr. Johnson Preface to Shakespeare.
Unit – 4	Wordsworth – Preface to the Lyrical Ballads; Coleridge – BiographiaLiteraria, Ch. XIII & XIV.
Unit – 5	Mathew Arnold – Essays in Criticism (Second Series); T.S. Eliot – Tradition and Individual Talent

Books Recommended : -

KapilKapoor	- Critical Theory
R.S. Pathak	- Literary Theory
Charusheel Singh	- Literary Theory, Linear Configurations
Butcher (tr.)	- Aristotle's Poetics
Scott James	- The Making of Literature
David Duiches	- Modern Criticism and Theory: A Reader (Long Man)
H. Adams and L. Searle (ed)	– Critical theory Since 1965 (Farida Stale University Press)
A.H. Giltert	- Literary Criticism Plato to Dryden
T. Eogleton	- Literary Theory : An Introduction (Blackwell Oxford, 19 Department of Higher Education, Govt. of M.P.

Note: - The internal assessment will be based on a term paper written by the student and then its presentation.

Outcome

This course will equip the student to prepare himself / herself to lay the foundation for learning how to address the dicursive and ideational aspects of literary texts. The study of critical theories will help the student in understanding literature and life better.

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Post Graduate Semester Wise Syllabus
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As Amended in the BOS meeting held on 21/09/2020

Class	-	M.A.
Subject	-	English Literature
Semester	-	III
Title of Subject of Group	-	English Language
Paper	-	II
Compulsory/Optional	-	Compulsory
Max. Marks	-	80 + 20 =100
	-	Theory + Internal Assessment

OBJECTIVE
To enable the students to get an insight into the study of language and its socio-cultural variables.
Particulars

Unit – 1	Definition, Functions, Characteristics, Development of English Language
Unit – 2	Language Variations, Register, Style and Dialect, Approaches to the Study of Language Synchronic and Diachronic
Unit – 3	Definition of Phonetics and Phonology Difference between Phonetics and Phonology, Organs of Speech.
Unit – 4	Phonomes, Allophones, Phonetic, Symbols for Sound in RP.
Unit – 5	Basics of Transformational Generic Grammar: Nature and Charactcristics.

Suggested Readings:
Verma and Krishnamurty: Modern Linguistics : An Introduction (O.U.P. 1989)
A.C. Gimson : As Introduction to the Pronounciationof English.
P.K. BansalandJ.B. Harison : Spoken English for India.
GeoffreyLeech : A Lingustic Guide to English Poetry (Longuman, London 1969)
David Crystal : Linguistics (Penguin)
Geoffrey Leech and Jan Svartvic : A Communicative Grammar of English

Note: - The internal assessment will be based on a term paper written by the student and then its presentation.

Outcome
In this paper students develop an understanding of the concepts, theories, and methodologies used in linguistics.

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As Amended in the BOS meeting held on 21/09/2020

Class	-	M.A.
Subject	-	English Literature
Semester	-	III
Title of Subject of Group	-	Indian Writing in English
Paper	-	III (A)
Compulsory/Optional	-	Optional
Max. Marks	-	80 + 20 =100
	-	Theory + Internal Assessment

Objective:
The aim of this paper is to make the learner aware of Indian sensibility in the representative works.
Particulars

Unit – 1	Annotations : Six Passages selecting at least two from Unit II, III and IV will be given and two to be attempted.
Unit – 2	Sri Aurobindo : Striel Book Iconto I. R.N. Tagore : Geetanjali – poems 1 to 10 (Mc-Millianedition).
Unit – 3	APJ Abdul Kalam : Wings of Fire
Unit – 4	Tendulkar : Silence, The court is in session Mohan Rakesh : Halfway House, (Basu, K Dilip ed. New Delhi: Wordview Publication, 2006)
Unit – 5	M.R. Anand : Untouchable R.K. Narain : The English Teacher

Books Recommended :

K.R.S. Lyengar.	- Indian Writings in English
Meenakshi	- Twice Born Fiction
A.N. Dwivedi	- Kamala Dass
Thompson	- Tagore
O.P. Budholia	- Anita Desai: Vision and Technique in her Novels.
M.K. Maik (ed.)	- History of Indian English Literature

Note: - The internal assessment will be based on a term paper written by the student and then its presentation.

Outcome:
Students get to know the beauty and depth of modern Indian English literautre.

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Session 2020-21
As Amended in the BOS meeting held on 21/09/2020

Class	-	M.A.
Subject	-	English Literature
Semester	-	III
Title of Subject of Group	-	Commonwealth Literature in English
Paper	-	III (B)
Compulsory/Optional	-	Optional
Max. Marks	-	80 + 20 =100
	-	Theory + Internal Assessment

Objective:
The objective is to make the students experience the diversity and richness of current English Literature.

Particulars

Unit – 1	Canadian Poetry Margaret Atwood : (1) This is a photograph of me. (2) Tricks with Mirrors.
Unit – 2	Canadian Fiction Margaratee Laurence : The Stone Angel
Unit – 3	British Novel Doris Lessing : The Grass is Singing
Unit – 4	Carribean Novel George Lamming : In the Castle of my Skin.
Unit – 5	Australian Novel Patrick White : A Fringe of Leaves.

Books Recommended:
1] R.K. Dhawan ed. Commonwealth Literature in English.
2] All original works by the prescribed authors.

Note: - The internal assessment will be based on a term paper written by the student and then its presentation.

Outcome:
The student gets the taste of English literature being written in different countries.

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Post Graduate Semester Wise Syllabus
Session 2020-21
As Amended in the BOS meeting held on 21/09/2020

Class	-	M.A.
Subject	-	English Literature
Semester	-	III
Title of Subject of Group	-	American Literature
Paper	-	IV (A)
Compulsory/Optional	-	Optional
Max. Marks	-	80 + 20 =100
	-	Theory + Internal Assessment

Objective:
The present course is an introductory course that enables the students to understand the character, flavour and ethos of the American literature. A second aim is to initiate critical knowledge of the major literary innovations and cultural issues of the 19th and 20th century America.

Particulars

Unit – 1	Annotations: Six Passages selection at least two from Units II, III and IV each to be set, two to be attempted.
Unit – 2	Prose Emerson : American Scholar.
Unit – 3	Poetry Walt Whitman : O Captain, My Captain; Song of Myself; When Lilacs last in the Dooryard Bloomed, I Celebrate Myself. Robert Frost: After Apple Picking, Birches, The Road not taken.
Unit – 4	Drama: Arthur Miller – All my Sons Harlod Pinter : The Caretaker
Unit – 5	Fiction: Mark Twain: Huckleberry Finn.

Books Recommended:
1] History of American Literature Goodman.
2] Walt Whitman by D. Dhawale.
3] Cycle of American Literature by Rober Spiller.

Note: - The internal assessment will be based on a term paper written by the student and then its presentation.

Outcome:
The student develops an understanding of American Literature.

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Post Graduate Semester Wise Syllabus
Session 2020-21
As Amended in the BOS meeting held on 21/09/2020

Class	-	M.A.
Subject	-	English Literature
Semester	-	III
Title of Subject of Group	-	Linguistics and Stylistics
Paper	-	IV (B)
Compulsory/Optional	-	Optional
Max. Marks	-	80 + 20 =100
	-	Theory + Internal Assessment

Objective:

The students can improve recognition and operation in various styles and registers in English. They rectify their mistakes in pronunciation and grammar and they build their vocabulary skills.

Particulars

Unit – 1	Definition of Linguistics, branches, characteristics of language, nature and properties of language. Language as a system of communication, Human language and Animal Communication, Language as a system of systems.
Unit – 2	Linguistics: Language varieties, Register and Style, Language variation and Sociolinguistics, Language Change. Synchronic, Diachronic and Historical Linguistics, Minimal and non minimal pairs.
Unit – 3	Phonetics Organs of speech, speech mechanism, Classification and Description of Speech Sounds, Consonants and Vowels. International Phonetic alphabet, The Phoneme, The Allophones, the Syllable, The Phoneme theory & Syllable Theory.
Unit – 4	Grammar Determiners, Word Classes, Noun Phrase, Verbal group, Verb Phrase, Verb Patterns Finite & Non Finite Forms, Article Features, Affix Switch.
Unit – 5	Stylistics Nature and Scope; Figures of Speech; Imagery.

Books Recommended:

1] Verma and Krishnaswamy: Modern Linguistics: An Introduction (OUP 1989).
2] A.C. Gimson: An Introduction to the pronunciation of English.
3] R.K. Bansal : An Outline of general Phonetics.
4] Geoffrey Leech : A Linguistic Guide to English Poetry (Longman, London 1969).
5] David Crystal : Linguistics (Penguin)
6] Mittins: Attitude to English Usage, Oxford.
7] N. Krishnaswamy : Modern English.
8] CollimsCobuild: English Grammar.

Note: - The internal assessment will be based on a term paper written by the student and then its presentation.

Outcome

On completion of the course, students should be able to achieve fluency and grammatical accuracy.

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Post Graduate Semester Wise Syllabus
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As Amended in the BOS meeting held on 21/09/2020

Class	-	M.A.
Subject	-	English
Semester	-	IV
Title of Subject of Group	-	Critical Theory
Paper	-	I
Compulsory/Optional	-	Compulsory
Max. Marks	-	80 + 20 =100
	-	Theory + Internal Assessment

Objective
This course provides students with grounding in some of the major theoretical methodologies in literary studies.

Particulars

Unit – 1	AnandVardhan : Dhwani Theory. F.R. Leavis : Literary Criticism and Philosophy
Unit – 2	I.A. Richards : Two Uses of Language. J.C. Ransom : Concept of Structure and Texture of Poetry.
Unit – 3	Ferdinand Saussure : Nature of Linguistic Sign J. Derrida : Structure, Sign and Play in the Discourse of Human Sciences.
Unit – 4	Edward Said : Crisis (The Scope of Orientalism) Gayatri Chakravorty Spivak: Can the Subaltern Speak.
Unit – 5	Virginia Woolf : A Room of one's own Elaine Showalter : Towards a Feminist Poetics

Book Recommended:

KapilKapoor	: Critical Theory.
R.S. Pathak	: Literary Theory.
Charusheel Singh	: Literary Theory, Linear Configuration.
Butcher (tr)	: Aristotle's Poetics.
Scott James	: The making of Literature.
David Daiches	: Critical Approaches to English Literature.
H.Adams and L. Searle (Ed.)	: Critical Theory since 1965 (Florida State University Press).
A.H. Gilbert	: Literary Criticism Plato to Dryden.
T. Eagleton	: Literary Theory : An Introduction (Black well, Oxford, 1983).

Note: - The internal assessment will be based on a term paper written by the student and then its presentation.

Outcome
Students read complex literary texts deeply and critically.

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Post Graduate Semester Wise Syllabus
Session 2020-21
As Amended in the BOS meeting held on 21/09/2020

Class	-	M.A.
Subject	-	English Literature
Semester	-	IV
Title of Subject of Group	-	English Language (Compulsory Paper)
Paper	-	II
Compulsory/Optional	-	Compulsory
Max. Marks	-	80 + 20 =100
	-	Theory + Internal Assessment

Objective
The objective is to enhance the learning and teaching skills of English of the students.
Particulars

Unit – 1	Morphology Morpheme, Allomorph, Word formation.
Unit – 2	Linguistic Analysis I.C. Analysis & Ambiguities.
Unit – 3	Phonology Sound sequences: Syllable, Word Stress, Strong and Weak forms, Stress and Intonation.
Unit – 4	Grammar Sentence types and their transformation relations : (a) Statement (b) Question, (c) Negative, (d) Passive, (e) Imperative.
Unit – 5	Grammar Word classes: Noun Phrase, Verb Phrase, Adjunct Phrase, Syntax Coordination, Subordination, Relative Clauses, Adverbials, Determiners, Article Features, Concord.

Books Recommended:

1] Verma and Krishnaswamy : Modern Linguistics : An Introduction (O.U.P. 1989)
2] A.C. Gimson : An Introduction to the pronunciation of English.
3] R.K. Bansal and J.B. Harrison : Spoken English for India.
4] Geoffrey Leech : A Linguistic Guide to English Poetry (Longman, London 1969)
5] David Crystal : Linguistics (Penguin)
6] Geoffrey Leech and Jan Svartvic : A Communicative Grammar of English.

Note: - The internal assessment will be based on a term paper written by the student and then its presentation.

Outcome:
The students will learn English language in a scientific and systematic manner.

Department of Higher Education, Govt. of M.P.
Post Graduate Semester Wise Syllabus
Session 2020-21
As Amended in the BOS meeting held on 21/09/2020

Class	-	M.A.
Subject	-	English Literature
Semester	-	IV
Title of Subject of Group	-	Indian Writings in English
Paper	-	III (A)
Compulsory/Optional	-	Optional
Max. Marks	-	80 + 20 =100
	-	Theory + Internal Assessment

Objective:
The aim of this course is to give basic knowledge about Indian English literature and Indian Literature in translation.

Particulars

Unit – 1	Annotations: Six Passages selection at least two from Unit II, III and IV will be given and two to be attempted.
Unit – 2	(1) Vishnu Sharma : Panchatantra (Book) (2) MunshiPremchand : The Shroud (Kafan)
Unit – 3	(1) Sarojini Naidu (All poems of each poet in V.K. Gokak ed. (2) Kamala Das (Golden Treasure of Indo – Anglian Poetry- Sahitya Academy)
Unit – 4	(1) M.R. Anand : Untouchable (2) R.K. Narayan : The English Teacher
Unit – 5	(1) AmitavGhosh : The Shadow Lines (2) ShashiDeshpande : That Long Silence

Books Recommended:

1]	K.R.S. lyengar	: Indian Writings in English
2]	M.K. Naik	: History of Indian English Literature.
3]	M.K. Naik (ed)	: Perspectives on Indian Drama in English
4]	MeenakshiMukharjee	: Twice Born Fiction.
5]	Thompson	: Tagore.
6]	O.P. Budholia	: Anita Desai: Vision and Techniques in her Novels.

Note: - The internal assessment will be based on a term paper written by the student and then its presentation.

Outcome
The students will know the essence of Indian writing in English and will also get the taste of Indian Literature in translation.

Department of Higher Education, Govt. of M.P.
Post Graduate Semester Wise Syllabus
Session 2020-21
As Amended in the BOS meeting held on 21/09/2020

Class	-	M.A.
Subject	-	English Literature
Semester	-	IV
Title of Subject of Group	-	Commonwealth Literature in English
Paper	-	III (B)
Compulsory/Optional	-	Optional
Max. Marks	-	80 + 20 =100
	-	Theory + Internal Assessment

Objective:
The aim of this paper is to make students know and experience the literature from commonwealth countries.

Particulars

Unit – 1	Canadian Poetry Michael Ondaatje : (1) The Cinnamon Peeker. : (2) To a Sad Daughter.
Unit – 2	Canadian Fiction Margaret Atwood : Surfacing
Unit – 3	The African Novel NadimeGordimer : July's People Chinua Achebe : Arrow of God.
Unit – 4	Australian and Caribbean Novel V.S. Naipaul : A House of Mr. Biswas. Elizabeth Jolley : My Father's Moon.
Unit – 5	Canadian Drama Sharan Pollock : Walsh Draw Heydon Taylor : Alternatives

Books Recommended:
1] R.K. Dhawan ed. Commonwealth Literature in English.
2] All original works by the prescribed authors.

Note: - The internal assessment will be based on a term paper written by the student and then its presentation.

Outcome
Students read and understand the basics of Commonwealth Literature.

Department of Higher Education, Govt. of M.P.
Post Graduate Semester Wise Syllabus
Session 2020-21
As Amended in the BOS meeting held on 21/09/20

Class	-	M.A.
Subject	-	English Literature
Semester	-	IV
Title of Subject of Group	-	American Literature
Paper	-	IV (A)
Compulsory/Optional	-	Optional
Max. Marks	-	80 + 20 =100
	-	Theory + Internal Assessment

Objective:

This Course aims to provide the learner an overall idea of what American Literature is and help the learner see the differences between major American writing.

Particulars

Unit – 1	Annotations: (Six Passages selection at least two from Unit II, III and IV each to be set, two to be attempted.)
Unit – 2	Prose R.W. Emerson : American Scholar H.D. Thoreau : Civil Disobedience
Unit – 3	Poetry Emily Dickinson : Because I could not stop for Death, I taste a Liquor Never Brewed, Light in Spring, This is my letter to the world. Sylvia Plath: Daddy, Lady Lizarus, The Bee Meeting.
Unit – 4	Drama: Tenessee Williams: The Glass Menageric. Eugene O'Neill : Mourning Becomes Electra.
Unit – 5	Fiction: Ernest Hemingway : For whom the Bell Tolls Steinbeck : of Mice and Men.

Books Recommended:
1] History of American Literature Goodman.
2] Cycle of American Literature by Robet Spiller.

Note: - The internal assessment will be based on a term paper written by the student and then its presentation.

Outcome:
The learners will develop a taste for American prose writings, major essays and will also enjoy typical American Poetry.The learners will be motivated to read American Fiction.

Department of Higher Education, Govt. of M.P.
Post Graduate Semester Wise Syllabus
Session 2020-21
As Amended in the BOS meeting held on 21/09/2020

Class	-	M.A.
Subject	-	English Literature
Semester	-	IV
Title of Subject of Group	-	Linguistics and Stylistics
Paper	-	IV (B)
Compulsory/Optional	-	Optional
Max. Marks	-	80 + 20 =100
	-	Theory + Internal Assessment

Objective
The paper is an excellent exposure to the students pertaining to the study of the English language from its origins to the growth of vocabulary, phonetics, phonology, and grammar with modern perspectives.

Particulars

Unit – 1	Linguistics; Competence and performance, morphology, IC Ananlysis, Amisiguities.
Unit – 2	Phonetics Transcriptions – Phonetic Phonemic, strong and weak forms, ward accent, the Word Stress rules, intonation and rhythm in connected speech, Difference between R.P. & G.I.E.
Unit – 3	Stylistics: Foregrounding, Repetition, Collocation, Collocations Clash, Inversion, Parallelism, Coupling, Embedding.
Unit – 4	Deviance Grammatical and Conceptual Pre Supposition, Pragmatics, Implicature (Stylistic Analysis of a poem, two to be set, One to be attemped)
Unit – 5	Grammar Sentence Patterns, Syntax, Semantics, Surface structures & Deep Structures, Negativisation, Passivisation, Interrogative, and Imperative Transformation.

Books Recommended:

1] Verma and Krishna Swamy: Modern Linguistics: An Introduction.
2] A.C. Gimson : An Introduction to the Pronunciation of English.
3] R.K. Bansal : An Outline of General Phonetics.
4] Geoffrey Leech: A Linguistic Guide to English Poetry.
5] David Crysial : Linguistics.
6] Mittins: Attitude to English Usage.
7] N. Krishna Swamy: Modern English.
8] Collimscobuild: English Grammar.

Note: - The internal assessment will be based on a term paper written by the student and then its presentation.

Outcome
The Students will learn phonetics and phonology with a better understanding of organs of speech, phonemic symbols, classification of vowels and consonants, syllables, stress, etc. They will understand syntactic and semantic changes in grammar.

Outcome : -

M.A. English Literature is a classical, time-tested academic course which refines the literary and aesthetic sensibilities of the student. The students get a taste of a wide range of excellent specimens of literatrue from across the world. The student enjoys and analysis the best literature available in English. This course refines the quality of a human being. Literature inculcates universal human values.

Digitally signed by

Dr. Jaya Kapoor

Dept of English &MEL

University of Allahabad

DEPARTMENT OF PHILOSOPHY

SYLLABUS
CHOICE BASED CREDIT SYSTEM
(CBCS)

M. A. PHILOSOPHY

AWADHESH PRATAP SINGH
UNIVERSITY REWA (M.P.)

M.A. PHILOSOPHY
EXAMINATION SCHEME
(CBCS)

Semester	Paper No	Nomenclature	Type of Course	Theory/ External Assessment		Internal Assessment		Total Marks	Credit Point
				Max	Min	Max	Min		
Semester I	101	Indian Metaphysics	C.C.	60	21	40	14	100	04
	102	Western Metaphysics	C.C.	60	21	40	14	100	04
	103	Social Philosophy - I	C.C.	60	21	40	14	100	04
	104	Advaita Vedanta*	G.E.	60	21	40	14	100	04
	105	Comprehensive Viva-voce	C.C	Minimum Passing Marks - 35				100	04
Semester II	201	Indian Epistemology	C.C.	60	21	40	14	100	04
	202	Western Epistemology	C.C.	60	21	40	14	100	04
	203	Social Philosophy - II	C.C.	60	21	40	14	100	04
	204	Patanjal Yogsutra*	G.E.	60	21	40	14	100	04
	205	Comprehensive Viva-voce	C.C	Minimum Passing Marks - 35				100	04
Semester III	301	Philosophy of Religion - I	C.C.	60	21	40	14	100	04
	302	Logic - I	C.C.	60	21	40	14	100	04
	303	(A) ** Gandhian Philosophy Or (B) Western Ethics	D.C.E.	60	21	40	14	100	04
	304	Indian Ethics*	G.E.	60	21	40	14	100	04
	305	Comprehensive Viva-voce	C.C	Minimum Passing Marks - 35				100	04
Semester IV	401	Philosophy of Religion - II	C.C.	60	21	40	14	100	04
	402	Logic - II	C.C.	60	21	40	14	100	04
	403	(A)** Contemporary Indian Philosophy Or (B) Contemporary Western Philosophy	D.C.E.	60	21	40	14	100	04
	404	Vedanta Darshan*	G.E.	60	21	40	14	100	04
	405	Comprehensive Viva-voce	C.C	Minimum Passing Marks - 35				100	04

CC - Core Course, **GE** - Generic Elective, **DCE** - Discipline Centric Elective.

***** Students may choose this course as a Generic Elective or may choose a Course Offered in other UTDs or may choose a Course offered by MOOCs through SWAYAM. This Course can be Chosen by the students of other UTDs also.

****** Students may choose any one course as Discipline Centric Electives from the two choice based specialization offered A or B.

Overall Objective of Courses of M. A. in Philosophy

Philosophy is the heart of all known branches of academic discipline and it centrally regulates the activities and functions of our body, mind and intellect. Likewise Philosophy is the 'gem' of all human wit and wisdom. This is the reason that the Ph. D. degree holder in Physics, Chemistry, Maths, Botany obtains the degree of "Doctor of Philosophy in Computer Science" or "Doctor of Philosophy in Geology" and so on and so forth.

There are four pillars of Philosophy - Theoretical Philosophy (Metaphysics and Epistemology), Practical Philosophy (Ethics, Social and Political Philosophy, Aesthetics), Logic and History of Philosophy. It was kept in mind that all these components may remain included in our courses of study with balanced focus on Indian and Western Philosophy.

This programme with all its credits may help one become a good human being. Philosophy tells the difference between what man does and what he should do. It also helps one to know the goal of life. Most of the times, in life, man gets into dilemma and does not find himself able to get at the right direction and take the right decision. Such situations of life are handled in a better way by the knowledge of different schools of philosophy, Indian and Western.

The participants of this programme will be simultaneously prepared for Civil Services and other competitive exams. The moral values learned would be extremely beneficial for their professional success. Some of the participants with bright career can join the noble profession of teaching in higher education. Corporate would in full of stress now-a-days and there is a demand for their stress management, mental health and behavioural integrity. The participants of this programme can choose a career to become life coach to such target groups for their spiritual enlightment.

दर्शनशास्त्र **Philosophy**

एम. ए. प्रथम सेमेस्टर **M.A. I Semester**

Course	-	**Indian Metaphysics (भारतीय तत्त्वमीमांसा)**
Type of Course	-	**Core Course (C.C.)**
Paper	-	**101**
Marks	-	**60 (Theory) + 40 (Internal Assessment) = 100**

Objective - The objective of this course is to teach and train the students about all the metaphysical concepts and ideas of Classical Indian Metaphysics delving deep into the basics and fundamentals of Upanishads, Charvaka, Jaina, Buddhist, Sankhya and other Schools of Indian Philosophy. This will help the students to evaluate each system in critical and comparative light.

इकाई – 1 Unit - I

उपनिषद् – ब्रह्म का स्वरूप, निर्गुण ब्रह्म, सगुण ब्रह्म, आत्म तत्त्व, आत्मचेतना की चार अवस्थायें, आत्मा के कोश, मोक्ष का स्वरूप, मोक्ष के प्रकार। Upanishad - Nature of Brahman, Nirguna Brahman, Saguna Brahman, Atman (Self), Four stages of the self Consciousness, Kosha of Self, Nature of Liberation (Moksha), Kinds of Moksha.

इकाई – 2 Unit - II

चार्वाक दर्शन – तत्त्वमीमांसा, जैन दर्शन – जीव द्रव्य, अजीव द्रव्य, अनेकान्तवाद, स्याद्वाद, मोक्ष का स्वरूप। Charvaka Philosophy - Metaphysics, Jaina Philosophy - Jiva Dravya, Ajiva Dravya, Anekantavada, Syadvada, Nature of Moksha.

इकाई – 3 Unit - III

बौद्ध दर्शन – क्षणिकवाद, अनात्मवाद, सांख्य दर्शन – सत्कार्यवाद, पुरुष का स्वरूप, प्रकृति का स्वरूप, विकासवाद, मोक्ष का स्वरूप। Buddhist Philosophy - Momentarialism, Anatmavada, Sankhya Philosophy - Satkaryavada, Nature of Purusha, Nature of Prakriti, Evolutionism, Nature of Moksha.

इकाई – 4 Unit - IV

योग दर्शन – अभ्यास–वैराग्य, कियायोग, अष्टांग योग, ईश्वर का स्वरूप, न्याय दर्शन – आत्मा का स्वरूप, ईश्वर का स्वरूप। Yoga Philosophy - Abhyasa-Vairagya, Kriyayoga, Ashtanga Yoga, Nature of God, Nyaya Philosophy - Nature of Atman, Nature of God.

इकाई – 5 Unit - V

वैशेषिक दर्शन – सप्तपदार्थ, परमाणुवाद, मोक्ष का स्वरूप, मीमांसा दर्शन – धर्म, कर्म सिद्धान्त। Vaisheshika Philosophy - Seven Padarthas, Atomism, Nature of Moksha, Mimamsa Philosophy - Dharma, Theory of Karma.

उपयोगी ग्रंथ – **Suggested Readings :**

1. डॉ. चन्द्रधर शर्मा, भारतीय दर्शन अलोचन और अनुशीलन, मोतीलाल बनारसीदास, दिल्ली 1995
2. डॉ. बी.एन. सिंह एवं डॉ. आशा सिंह, भारतीय दर्शन, स्टूडेण्ट्स फ्रेण्ड्स एण्ड कम्पनी, वाराणसी, 1996
3. प्रो. हरेन्द्र प्रसाद सिन्हा, भारतीय दर्शन की रूपरेखा, मोतीलाल बनारसीदास, दिल्ली, 1963
4. बलदेव उपाध्याय, भारतीय दर्शन, शारदा मन्दिर, वाराणसी, 1997
5. नन्द किशोर देवराज, भारतीय दर्शन, उत्तर प्रदेश हिन्दी ग्रन्थ अकादमी, लखनऊ, 1975
6. Dutta & Chatterjee, An Introduction to Indian Philosophy, University of Calcutta, 1968.
7. M. Hiriyanna, Outlines of Indian Philosophy, George Allen and Unwin, Lodon, 1932.

Outcomes - Through this course students will come face to face with philosophical and rich cultural wisdom of our ancient thinkers. We also hope that students horizon of knowledge will be widened considerably.

दर्शनशास्त्र **Philosophy**

एम. ए. प्रथम सेमेस्टर **M.A. I Semester**

Course	-	**Western Metaphysics (पाश्चात्य तत्त्वमीमांसा)**
Types of Course	-	**Core Course (C.C.)**
Paper	-	**102**
Marks	-	**60 (Theory) + 40 (Internal Assessment) = 100**

Objective - The objectives of teaching this course would be to familiarize the students with the philosophical theories and tenets of very important Western thinkers starting from Socrates, Plato, Aristotle and passing through the Medieval thinkers St. Augustine, St. Anselm and St. Thomas Aquinas and ultimately including at Descartes, Spinoza and Leibnitz.

इकाई – 1 Unit - I

दर्शन का स्वरूप, दर्शन एवं तत्त्वमीमांसा, दर्शन एवं धर्म, पाश्चात्य दर्शन एवं भारतीय दर्शन में अंतर, सुकरात की पद्धति। Nature of Philosophy, Philosophy and Metaphysics, Philosophy and Religion, Difference between Western Philosophy and Indian Philosophy, Socratic Method.

इकाई – 2 Unit - II

प्लेटो – विज्ञानवाद, विज्ञान की विशेषताएँ, विज्ञान और वस्तु में सम्बन्ध, परम शुभ का विज्ञान, ईश्वर–विचार, आत्मा। Plato - Idealism, Characteristics of Ideas, Relation between Ideas and Objects, Idea of the Good, Demi-urge, Human Soul.

इकाई – 3 Unit - III

अरस्तू – तत्त्वमीमांसा, कारणता, द्रव्य और स्वरूप, ईश्वर। Aristotle - Metaphysics, Causation, Matter and Form, God.

इकाई – 4 Unit - IV

मध्ययुग की विशेषताएँ, संत ऑगस्टाइन – ईश्वर का स्वरूप, संत एन्सेल्म – ईश्वर अस्तित्व के प्रमाण, संत थॉमस एक्वीनस – ईश्वर सिद्धि के लिए प्रमाण। Characteristics of Medieval Age, St. Augustine - Nature of God, St. Anselm - Proof for the existence of God, St. Thomas Aquinas - Proof for the existence of God.

इकाई – 5 Unit - V

देकार्त – द्वैतवाद, स्पिनोजा – सर्वेश्वरवाद, समानान्तरवाद, लाइब्नीत्ज – चिदणुवाद, पूर्व स्थापित सामंजस्य का सिद्धान्त। Descartes - Dualism, Spinoza - Pantheism, Parallelism, Leibnitz - Monadology, Theory of Pre-established harmony.

उपयोगी ग्रंथ – **Suggested Readings :**

1. चन्द्रधर शर्मा, पाश्चात्य दर्शन, मोतीलाल बनारसीदास, दिल्ली, 1997
2. डॉ. बी.एन. सिंह, पाश्चात्य दर्शन, स्टूण्डेट्स फ्रेण्ड्स एण्ड कम्पनी, वाराणसी, 1973
3. याकूब मसीह, पाश्चात्य दर्शन का समीक्षात्मक इतिहास, मोतीलाल बनारसीदास, दिल्ली, 2005
4. जगदीश सहाय श्रीवास्तव, आधुनिक पाश्चात्य दर्शन का वैज्ञानिक इतिहास, पुस्तक स्थान, गोरखपुर, 1973
5. Will Durant, A story of Philosophy, Simon & Schuster, 1926 & Pocket Books, New York, 2006
6. Bertand Russell, A History of Western Philosophy, Union paper Backs, London, 1987
7. Frank Thilly, History of Western Philosophy, Central Book Depot, Allahabad, 1975
8. W.T Stace, A Critical History of Greek Philosophy Macmillan, New Delhi, 1985
9. Y. Masih, A Critical History of Western Philosophy, Motilal Banarasidas, Delhi, 1994.

Outcomes - Students will learn the well-connected history of human wisdom from Greek period to the Modern period beginning with Rene Descartes.

दर्शनशास्त्र **Philosophy**

एम. ए. प्रथम सेमेस्टर **M.A. I Semester**

Course	-	**Social Philosophy - I (समाज दर्शन - I)**
Types of Course	-	**Core Course (C.C.)**
Paper	-	**103**
Marks	-	**60 (Theory) + 40 (Internal Assessment) = 100**

Objective - The objective of this course is to make students conversant with Social Philosophy and its relation to Sociology, Political Science and Ethics. This course will also help in understanding family, marriages, state and justice in all ramifications. It is mainly concerned with the study of the values of various social phenomena.

इकाई – 1 Unit - I

समाज दर्शन – स्वरूप एवं विशेषताएँ, समाज दर्शन एवं समाजशास्त्र, समाज दर्शन एवं राजनीतिशास्त्र, समाज दर्शन एवं नीतिशास्त्र। Social Philosophy - Nature and Characteristics, Social Philosophy and Sociology, Social Philosophy and Political Science, Social Philosophy and Ethics.

इकाई – 2 Unit - II

परिवार – स्वरूप एवं विशेषताएँ, परिवार की उत्पत्ति के सिद्धान्त – पितृसत्तात्मक, मातृसत्तात्मक, एक विवाही, लिंग साम्यवादी, विकासात्मक सिद्धान्त, परिवार के कार्य, परिवार की दुर्बलताएँ। Family - Nature and Characteristics, Theory of Origin of Family - Patriarchal, Matriarchal, Monogamous, Sex Communism, Evolutionary Theory, Function of Family, Weakness of Family.

इकाई – 3 Unit - III

समाज – स्वरूप एवं मूल तत्त्व, समाज की उत्पत्ति के सिद्धान्त – सामाजिक अनुबन्ध, दैवी उत्पत्ति, पैतृक, मातृक, विकासवादी सिद्धान्त। Society - Nature and Fundamental Elements, Theory of Origin of Society - Social Contract, Divine Origin, Patriarchal, Matriarchal, Evolutionary Theory.

इकाई – 4 Unit - IV

राज्य – स्वरूप एवं मूल तत्त्व, राज्य की उत्पत्ति के सिद्धान्त – दैवी उत्पत्ति, शक्ति सिद्धान्त, पैतृक–मातृक, सामाजिक अनुबंध, विकासवादी सिद्धान्त। State - Nature and Fundamental Elements, Theory of Origin of State - Divine Origin, Theory of Force, Patriarchal-Matriarchal, Social Contract, Evolutionary Theory.

इकाई – 5 Unit - V

न्याय की अवधारणा, पुरस्कार और दण्ड, दण्ड के सिद्धान्त – प्रतिफलात्मक, निवर्तक, सुधारात्मक, आदर्शवादी सिद्धान्त। Concept of Justice, Reward and Punishment, Theory of Punishment - Retributive, Deterrent, Reformative, Idealistic Theory.

उपयोगी ग्रंथ – **Suggested Readings**

1. डॉ. ए. अवस्थी एवं डॉ. आर.के. अवस्थी, भारतीय राजनीतिक चिन्तन, रिसर्च पब्लिकेशन्स, जयपुर,
2. डॉ. जगदीशसहाय श्रीवास्तव, समाज–दर्शन की भूमिका, विश्वविद्यालय प्रकाशन, वाराणसी, 1999
3. डॉ. ह्रदय नारायण मिश्र, समाज दर्शन सैद्धांतिक एवं समस्यात्मक विवेचन, शेखर प्रकाशन, इलाहाबाद, 2003
4. बी.एन. सिंह, समाज दर्शन एवं राजनीति दर्शन, आशा प्रकाशन, वाराणसी, 1990
6. Krishna Saya, Social Philosophy: Past and Future, Indian Institute of Advanced Studies, 1978

Outcomes - A deep and wider knowledge of society, family, state and justice will help to understand the structure and complications of our society and various theories.

दर्शनशास्त्र **Philosophy**

एम. ए. प्रथम सेमेस्टर **M.A. I Semester**

Course	-	**Advaita Vedanta (अद्वैत वेदान्त)**
Types of Course	-	**Generic Elective (G.E.)**
Paper	-	**104**
Marks	-	**60 (Theory) + 40 (Internal Assessment) = 100**

Objective - This course aims at providing students with deep and sound knowledge of Advaita Philosophy. It will introduce concepts such as Maya, Brahman, Jivanmukti, Videhmukti and so on and so forth.

इकाई – 1 Unit - I

अद्वैत वेदान्त का अर्थ, गौडपादाचार्य – माण्डूक्य कारिका का सामान्य परिचय, अजातिवाद, आत्मतत्त्ववाद, अस्पर्शयोग। Meaning of Advaita Vedanta, Gaudapadacharya - A General Introduction of Mandukyakarika, Ajativada, Atmatattvavada, Asparshayoga.

इकाई – 2 Unit - II

शंकराचार्य – जीवन परिचय, साधन–चतुष्टय – विवेक, वैराग्य, षट्क सम्पत्ति, मुमुक्षुत्व, परिणामवाद और विवर्तवाद। Shankaracharya - Life Sketch, Sadhan Chatushtaya - Viveka, Vairagya, Shatka Sampatti, Mumukshutva, Parinamavada and Vivartavada.

इकाई – 3 Unit - III

सत्–असत्–सदसत् विचार, त्रिविध सत्ता – प्रातिभासिक, व्यावहारिक, पारमार्थिक, जगत् का स्वरूप, अनिर्वचनीयख्यातिवाद। Sat-Asat-Sadasat, Trividh Satta - Pratibhasika, Vyavharika, Parmarthika, Nature of the World, Anirvachaniyakhyativada.

इकाई – 4 Unit - IV

माया का स्वरूप, ब्रह्म का स्वरूप, जीव का स्वरूप, साक्षी, ईश्वर का स्वरूप। Nature of Maya, Nature of Brahman, Nature of Jiva, Sakshi, Nature of God.

इकाई – 5 Unit - V

मोक्ष का स्वरूप, जीवन्मुक्ति एवं विदेहमुक्ति, तत्त्वमसि का अर्थ, ज्ञान और कर्म, प्रकृति परिणामवाद का खण्डन। Nature of Moksha, Jivanmukti and Videhmukti, Meaning of Tattvamasi, Jnana and Karma, Refutation of Prakriti Parinamavada.

उपयोगी ग्रंथ – **Suggested Readings :**

1. डॉ. चन्द्रधर शर्मा, भारतीय दर्शन अलोचन और अनुशीलन, मोतीलाल बनारसीदास, दिल्ली, 1995
2. डॉ. बी.एन. सिंह एवं डॉ. आशा सिंह, भारतीय दर्शन, स्टूडेण्ट्स फ्रेण्ड्स एण्ड कम्पनी, वाराणसी, 1996
3. प्रो. हरेन्द्र प्रसाद सिन्हा, भारतीय दर्शन की रूपरेखा, मोतीलाल बनारसीदास, दिल्ली, 1963
4. बलदेव उपाध्याय, भारतीय दर्शन, शारदा मन्दिर, वाराणसी, 1997
5. नन्द किशोर देवराज, भारतीय दर्शन, उत्तर प्रदेश हिन्दी ग्रन्थ अकादमी, लखनऊ, 1975
6. Dutta & Chatterjee, An Introduction to Indian Philosophy, University of Calcutta, 1968.
7. M. Hiriyanna, Outlines of Indian Philosophy, George Allen and Unwin, Lodon, 1932.

Outcomes - It will motivate students to delve into this field of knowledge and take up this subject in the pursuit of their further study.

दर्शनशास्त्र **Philosophy**

एम. ए. प्रथम सेमेस्टर **M.A. I Semester**

Course	-	**Comprehensive Viva-voce**
Types of Course	-	**Core Course (C.C.)**
Paper	-	**105**
Marks	-	**100 (Minimum Passing Marks = 35)**

Objective - Students will be able to learn communication skills through viva-voce.

Comprehensive Viva-voce will be based on entire course of M. A. First Semester, Philosophy.

विशद् मौखिकी परीक्षा एम. ए. प्रथम सेमेस्टर दर्शनशास्त्र के सम्पूर्ण पाठ्यक्रमों पर आधारित होगी।

Outcomes - Students will find themselves prepared for interviews.

दर्शनशास्त्र **Philosophy**

एम. ए. द्वितीय सेमेस्टर **M.A. II Semester**

Course	-	**Indian Epistemology (भारतीय ज्ञानमीमांसा)**
Types of Course	-	**Core Course (C.C.)**
Paper	-	**201**
Marks	-	**60 (Theory) + 40 (Internal Assessment) = 100**

Objective - Epistemology is the most important branch of any school of Philosophical Thought. The objective of this course is to provide different theories of knowledge, its nature, its variety within the philosophical schools of Charvaka, Buddhist and Nyaya schools.

इकाई – 1 Unit - I

ज्ञानमीमांसा का अर्थ, प्रमा का अर्थ एवं स्वरूप, अप्रमा, चार्वाक दर्शन की ज्ञानमीमांसा, चार्वाक द्वारा अनुमान प्रमाण का खण्डन। Meaning of Epistemology, Meaning and Nature of Prama, Aprama, Epistemology of Charvaka Philosophy, Refutation of Anumana Pramana by Charvaka.

इकाई – 2 Unit - II

स्वतः प्रामाण्यवाद, परतः प्रामाण्यवाद, ख्यातिवाद – अन्यथाख्यातिवाद, विपरीतख्यातिवाद, अख्यातिवाद, सत्ख्यातिवाद। Swatah Pramanyavada, Paratah Pramanyavada, Khyativada - Anyathakhyativada, Viparitakhyativada, Akhyativada, Satkhyativada.

इकाई – 3 Unit - III

बौद्ध दर्शन – प्रत्यक्ष एवं अनुमान प्रमाण का स्वरूप, प्रमाण–सम्प्लव और प्रमाण–व्यवस्था, सांख्य–योग – प्रत्यक्ष, अनुमान और शब्द प्रमाण। Buddhist Philosophy - Nature of Pratyaksha and Anumana Pramana, Pramana Samplava and Pramana Vyavastha, Sankhya-Yoga - Pratyaksha, Anumana, Shabda Pramana.

इकाई – 4 Unit - IV

न्याय दर्शन – प्रत्यक्ष प्रमाण, प्रत्यक्ष के भेद – लौकिक प्रत्यक्ष, अलौकिक प्रत्यक्ष – सामान्य लक्षण प्रत्यासत्ति, ज्ञानलक्षण प्रत्यासत्ति एवं योगज, शब्द प्रमाण, उपमान प्रमाण। Nyaya Philosophy - Pratyaksha Pramana, Kinds of Pratykasha - Laukik Pratyaksha, Alaukik Pratyaksha - Samanya Lakshan Pratyasatti, Jnana Lakshana Pratyasatti and Yogaj, Shabda Pramana, Upmana Pramana.

इकाई – 5 Unit - V

न्याय दर्शन – अनुमान प्रमाण, अनुमान के भेद, व्याप्ति, पंचावयव, हेत्वाभास – सव्यभिचार, विरुद्ध, साध्यसम, कालातीत हेत्वाभास। Nyaya Philosophy - Anumana Pramana, Kinds of Anumana, Vyapti, Panchavayava, Hetvabhasa - Savyabhichar, Viruddh, Sadhyasama, Kalatita Hetvabhasa.

उपयोगी ग्रंथ – **Suggested Readings :**

1. डॉ. चन्द्रधर शर्मा, भारतीय दर्शन अलोचन और अनुशीलन, मोतीलाल बनारसीदास, दिल्ली 1995
2. डॉ. बी.एन. सिंह एवं डॉ. आशा सिंह, भारतीय दर्शन, स्टूडेण्ट्स फ्रेण्ड्स एण्ड कम्पनी, वाराणसी, 1996
3. प्रो. हरेन्द्र प्रसाद सिन्हा, भारतीय दर्शन की रूपरेखा, मोतीलाल बनारसीदास, दिल्ली, 1963
4. बलदेव उपाध्याय, भारतीय दर्शन, शारदा मन्दिर वाराणसी, 1997
5. नन्द किशोर देवराज, भारतीय दर्शन, उत्तर प्रदेश हिन्दी ग्रन्थ अकादमी, लखनऊ, 1975
6. Dutta & Chatterjee, An Introduction to Indian Philosophy, University of Calcutta, 1968.
7. M. Hiriyanna, Outlines of Indian Philosophy, George Allen and Unwin, London, 1958.

Outcomes - This study will make students critical and analytical about the topic.

दर्शनशास्त्र **Philosophy**

एम. ए. द्वितीय सेमेस्टर **M.A. II Semester**

Course	-	**Western Epistemology (पाश्चात्य ज्ञानमीमांसा)**
Types of Course	-	**Core Course (C.C.)**
Paper	-	**202**
Marks	-	**60 (Theory) + 40 (Internal Assessment) = 100**

Objective - Epistemology is a important branch of Philosophy. It investigates the origin, nature, methods and limits of human knowledge. It is theory of knowledge of the critical study of its validity, methods and scope. Epistemology asks question 'How and what we know with what degree of certainty?' It is an enquiry about the status, nature and method of knowledge. Its study is necessary for a student of Philosophy to be conversant with western perspective. The objective of this course is to make the students inquisitive about origin, limit and certainty of knowledge.

इकाई – 1 Unit - I

जेनो का तर्क, प्लेटो – ज्ञानमीमांसा, 'ज्ञान प्रत्यक्ष है' का खण्डन, 'ज्ञान धारणा है' का खण्डन, विज्ञानवाद, अरस्तू – तर्कशास्त्र। Logic of Zeno, Plato- Epistemology, Refutation of 'knowledge is perception', Refutation of 'knowledge is opinion,' Idealism, Aristotle - Logic.

इकाई – 2 Unit - II

बुद्धिवाद का स्वरूप, देकार्त – दार्शनिक प्रणाली, संदेहवाद, 'मैं सोचता हूँ, इसलिए मैं हूँ', स्पिनोजा – ज्ञान–सिद्धान्त, लाइब्नीत्ज – निरन्तरता का नियम, व्यक्तित्व का नियम, सामंजस्य का नियम, पर्याप्त कारणता का नियम। Nature of Rationalism, Descartes - Philosophical Method, Scepticism, 'I think, therefore I am', Spinoza - Theory of knowledge, Leibnitz - Law of Continuity, Law of Individuality, Law of Harmony, Law of Sufficient Cause.

इकाई – 3 Unit - III

अनुभववाद का स्वरूप, जॉन लॉक – ज्ञान सिद्धान्त, जन्मजात प्रत्ययों का खण्डन, प्रत्यय, गुण, ज्ञान के स्तर – आन्तर प्रत्यक्ष ज्ञान, बाह्य प्रत्यक्ष ज्ञान, परोक्ष ज्ञान। Nature of Empiricism, John Locke - Theory of Knowledge, Refutation of Innate Ideas, Ideas, Quality, Degrees of Knowledge - Intuitive Knowledge, Sensitive Knowledge, Demonstrative Knowledge.

इकाई – 4 Unit - IV

बर्कले – अमूर्त प्रत्ययों का खण्डन, जड़ तत्त्व का खण्डन, 'सत्ता अनुभवमूलक है', विज्ञानवाद, विज्ञानवाद की समीक्षा। Berkeley - Refutation of Abstract Ideas, Refutation of Matter, 'Esse Est Percipii, Idealism, Criticism of Idealism.

इकाई – 5 Unit - V

ह्यूम – अनुभववाद, विज्ञानों का पारस्परिक सम्बन्ध, मानव ज्ञान, कार्यकारण सिद्धान्त, संदेहवाद, कान्ट – समीक्षावाद। Hume - Empiricism, Association of Ideas, Human Knowledge, Causation Theory, Scepticism, Kant - Criticism.

उपयोगी ग्रंथ – **Suggested Readings:**

1. चन्द्रधर शर्मा, पाश्चात्य दर्शन, मोतीलाल बनारसीदास, दिल्ली, 1997
2. डॉ. बी.एन. सिंह, पाश्चात्य दर्शन, स्टूण्डेट्स फ्रेण्ड्स एण्ड कम्पनी, वाराणसी, 1973
3. याकूब मसीह, पाश्चात्य दर्शन का समीक्षात्मक इतिहास, मोतीलाल बनारसीदास, दिल्ली, 2005
4. जगदीश सहाय श्रीवास्तव, आधुनिक पाश्चात्य दर्शन का वैज्ञानिक इतिहास, पुस्तक स्थान, गोरखपुर, 1973
5. Will Durant, A story of Philosophy, Simon & Schuster, 1926 & Pocket Books, New York, 2006
6. Bertand Russell, A History of Western Philosophy, Union paper Backs, London, 1987
7. Frank Thilly, History of Western Philosophy, Central Book Depot, Allahabad, 1975
8. W.T Stace, A Critical History of Greek Philosophy Macmillan, New Delhi, 1985

Outcomes - A student well-versed in this branch can analyze the contents of knowledge in a right perspective. He will learn this branch of knowledge from Greek period to the time of Hume. A perfect study of epistemology of Zeno, Socrates, Plato, Aristotle and three European Rationalists and three European Empiricists, i.e. from Zeno to Hume will make student a good researcher for further higher studies.

दर्शनशास्त्र **Philosophy**

एम. ए. द्वितीय सेमेस्टर **M.A. II Semester**

Course	-	**Social Philosophy - II (समाज दर्शन - II)**
Types of Course	-	**Core Course (C.C.)**
Paper	-	**203**
Marks	-	**60 (Theory) + 40 (Internal Assessment) = 100**

Objective - The objective of teaching this course is to make the students conversant with topic such as Democracy, Totalitarianism, Socialism, Communism, Gandhism, Sarvodaya, Satyagraha, Anarchism, Constitutionalism, Terrorism, Capitalism etc. and their main features and related problems.

इकाई – 1 Unit - I

प्रजातन्त्र – स्वरूप, विशेषताएँ, आलोचना, सर्वाधिकारवाद – स्वरूप, विशेषताएँ, आलोचना। Democracy - Nature, Characteristics, Criticism, Totalitarianism - Nature, Characteristics, Criticism.

इकाई – 2 Unit - II

समाजवाद – स्वरूप, विशेषताएँ, आलोचना, साम्यवाद – स्वरूप, विशेषताएँ, आलोचना। Socialism - Nature, Characteristics, Criticism, Communism - Nature, Characteristics, Criticism.

इकाई – 3 Unit - III

गाँधीवाद – सर्वोदय, सत्याग्रह, न्यास का सिद्धान्त, अराजकतावाद – स्वरूप, विशेषताएँ, आलोचना। Gandhism - Sarvodaya, Satyagrah, Doctrine of Trusteeship, Anarchism - Nature, Characteristics, Criticism.

इकाई – 4 Unit - IV

संविधानवाद – स्वरूप, विशेषताएँ, समस्यायें, संविधान और संविधानवाद, क्रान्ति – स्वरूप, विशेषताएँ, आलोचना। Constitutionalism - Nature, Characteristics, Problems, Constitution and Constitutionalism, Revolution - Nature, Characteristics, Criticism.

इकाई – 5 Unit - V

आतंकवाद – स्वरूप, आतंकवाद के उद्‌भव के कारण, आलोचना, पूँजीवाद – स्वरूप, विशेषताएँ, आलोचना। Terrorism - Nature, The Causes of the Emergence of Terrorism, Criticism, Capitalism - Nature, Characteristics, Criticism.

उपयोगी ग्रंथ – **Suggested Readings:**

1. बसन्त कुमार लाल, समकालीन भारतीय दर्शन, मोतीलाल बनारसीदास, दिल्ली, 1963
2. डॉ. ए. अवस्थी एवं डॉ. आर.के. अवस्थी, भारतीय राजनीतिक चिन्तन, रिसर्च पब्लिकेशन्स, जयपुर,
3. डॉ. जगदीशसहाय श्रीवास्तव, समाज–दर्शन की भूमिका, विश्वविद्यालय प्रकाशन, वाराणसी, 1999
4. डॉ. हृदय नारायण मिश्र, समाज दर्शन सैद्धांतिक एवं समस्यात्मक विवेचन, शेखर प्रकाशन, इलाहाबाद, 2003
5. बी.एन. सिंह, समाज दर्शन एवं राजनीति दर्शन, आशा प्रकाशन, वाराणसी, 1990
6. Krishna Saya, Social Philosophy: Past and Future, Indian Institute of Advanced Studies, 1978

Outcomes - This course will help students to understand all kinds of theories that are in the vogue present day society.

दर्शनशास्त्र **Philosophy**

एम. ए. द्वितीय सेमेस्टर **M.A. II Semester**

Course	-	**Patanjal Yogsutra (पातंजल योगसूत्र)**
Types of Course	-	**Generic Elective (G.E.)**
Paper	-	**204**
Marks	-	**60 (Theory) + 40 (Internal Assessment) = 100**

Objective - This course contains textual as well as practical knowledge of the topic which will help the students to do something very substantial and beneficial for society at large. The problem of health and mental stress and strain will also be taken care of.

इकाई – 1 Unit - I

महर्षि पतंजलि का व्यक्तित्व एवं कृतित्व, पातंजल योगसूत्र का सामान्य परिचय – समाधि पाद, साधनपाद, विभूतिपाद, कैवल्यपाद, पातंजल योग दर्शन का महत्व। Personality and Artistry of Maharshi Patanjali, A General Introduction of Patanjal Yogasutra - Samadhipada, Sadhanapada, Vibhutipada, Kaivlyapada, Importance of Patanjal Yoga Philosophy.

इकाई – 2 Unit - II

योग की परिभाषा, चित्त का स्वरूप, चित्तभूमियाँ, चित्तवृत्तियाँ – प्रकार एवं वृत्ति निरोध के उपाय। Definition of Yoga, Nature of Chitta, Chittabhumies, Chittavritties - Types and Techniques of Vrittinirodh.

इकाई – 3 Unit - III

अष्टांग योग – यम – लक्षण, प्रकार एवं सिद्धि, नियम – लक्षण, प्रकार एवं सिद्धि, आसन – लक्षण एवं सिद्धि, प्राणायाम – लक्षण, प्रकार एवं सिद्धि। Ashtanga Yoga - Yama - Characteristics, Types and Result, Niyama - Characteristics, Types and Result, Asana - Characteristics and result, Pranayama - Characteristics, Types and Result.

इकाई – 4 Unit - IV

प्रत्याहार – लक्षण एवं सिद्धि, धारणा – लक्षण एवं सिद्धि, ध्यान – लक्षण एवं सिद्धि, समाधि – लक्षण, प्रकार एवं सिद्धि, बहिरंग साधन एवं अन्तरंग साधन। Pratyahara - Characteristics and Result, Dharna - Characteristics and Result, Dhyana - Characteristics and Result, Samadhi - Characteristics, Types and Result, Bahiranga Sadhana and Antaranga Sadhana.

इकाई – 5 Unit - V

अभ्यास–वैराग्य, क्रियायोग, क्लेश का स्वरूप – अविद्या, अस्मिता, राग, द्वेष एवं अभिनिवेश। Abhyasa-Vairagya, Kriyayoga, Nature of Klesha - Avidya, Asmita, Raga, Dvesha and Abhinivesha.

उपयोगी ग्रंथ – **Suggested Readings:**

1. डॉ. न. कि. देवराज (सम्पादक), भारतीय दर्शन, उत्तर प्रदेश हिन्दी संस्थान, लखनऊ, तृतीय संस्करण, 2003
2. बी. कामेश्वर राव, सांख्य प्रज्ञा, ग्रन्थ भारती, जयपुर, 1991
3. डॉ. सम्पूर्णानन्द, योगदर्शन, हिन्दी समिति, सूचना विभाग, उ. प्र. 1965
4. स्वामी विवेकानंद, राजयोग, पं. सूर्यकान्त त्रिपाठी निराला (अनुवादक), रामकृष्ण मठ, धन्तोली, नागपुर, 2017
5. ई.सी.पी. सक्सेना, योग एवं अध्यात्म दर्शन, राधा पब्लिकेशन्स, नई दिल्ली, 2001
6. श्री स्वामी ओमानन्द, पातंजलयोगप्रदीप, गीता प्रेस, गोरखपुर, सं. 2030
7. Fernando & D. Carmen Tola, The Yoga Sutras of Patanjali, on concentration of Mind, Motilal Banarsidas, Delhi, 2001

Outcomes - The students after their study will be able to alleviate and mitigate the sufferings and stresses of the masses at large.

दर्शनशास्त्र **Philosophy**

एम. ए. द्वितीय सेमेस्टर **M.A. II Semester**

Course	-	**Comprehensive Viva-voce**
Types of Course	-	**Core Course (C.C.)**
Paper	-	**205**
Marks	-	**100 (Minimum Passing Marks = 35)**

Objective - Students will be able to learn communication skills through viva-voce.

Comprehensive Viva-voce will be based on entire course of M. A. Second Semester, Philosophy.

विशद् मौखिकी परीक्षा एम. ए. द्वितीय सेमेस्टर दर्शनशास्त्र के सम्पूर्ण पाठ्यक्रमों पर आधारित होगी।

Outcomes - Students will find themselves prepared for interviews.

दर्शनशास्त्र **Philosophy**

एम. ए. तृतीय सेमेस्टर **M.A. III Semester**

Course	-	**Philosophy of Religion - I (धर्म दर्शन - I)**
Types of Course	-	**Core Course (C.C.)**
Paper	-	**301**
Marks	-	**60 (Theory) + 40 (Internal Assessment) = 100**

Objective - The objective of teaching this course to dish out to the students the lucid exposition of Religion, Theology and morality and various theories regarding the origin of Religion. Theism, Atheism, Deism, Dualism, Panentheism and their different types and brands are lucidly presented to enrich the knowledge of students.

इकाई – 1 Unit - I

धर्म–दर्शन – स्वरूप, महत्व, धर्मदर्शन एवं ईश्वरशास्त्र, धर्मदर्शन एवं तत्त्वशास्त्र, धर्मदर्शन एवं धर्म, धर्म एवं नैतिकता। Philosophy of Religion - Nature, Importance, Philosophy of Religion and Theology, Philosophy of Religion and Metaphysics, Philosophy of Religion and Religion, Religion and Morality.

इकाई – 2 Unit - II

धर्म की उत्पत्ति – पूर्व मानव–शास्त्रीय सिद्धान्त, मानव–शास्त्रीय सिद्धान्त, मनोवैज्ञानिक सिद्धान्त, ऐतिहासिक सिद्धान्त, विश्व धर्म की अवधारणा, सनातन धर्म की अवधारणा। Origin of Religion - Pre-anthropological Theory, Anthropological Theory, Psychological Theory, Historical Theory, Concept of Universal Religion, Concept of Sanatan (Eternal) Religion.

इकाई – 3 Unit - III

धार्मिक चेतना – अर्थ, रुडोल्फ ऑटो की व्याख्या, अनीश्वरवाद का स्वरूप, अनीश्वरवाद के विभिन्न रूप, अनीश्वरवाद के विरुद्ध आक्षेप। Religious Consciousness - Meaning, Rudolf Otto's Analysis, Nature of Atheism, Forms of Atheism, Objections against Atheism.

इकाई – 4 Unit - IV

सर्वेश्वरवाद – स्वरूप, मूल्यांकन, द्वैतवाद – स्वरूप, मूल्यांकन, अनेकेश्वरवाद – स्वरूप, आपत्तियाँ। Pantheism - Nature, Evaluation, Dualism - Nature, Evaluation, Polytheism - Nature, Objections.

इकाई – 5 Unit - V

केवलनिमित्तेश्वरवाद – स्वरूप, आपत्तियाँ, निमित्तोपादानेश्वरवाद – स्वरूप, आपत्तियाँ, ईश्वरवाद – स्वरूप, मूल्यांकन। Deism - Nature, Objections, Panentheim - Nature, Objections, Theism - Nature, Evaluation.

उपयोगी ग्रंथ – **Suggested Readings :**

1. डॉ हरेन्द्र प्रसाद सिन्हा, धर्म–दर्शन की रूपरेखा, मोतीलाल बनारसीदास, पटना, 2017
2. डॉ बी. एन. सिंह, धर्म–दर्शन, स्टूडेण्ट्स फ्रेन्ड्स एण्ड कम्पनी, वाराणसी, 1989
3. एल. एन. शर्मा, धर्म–दर्शन, गंगासरन ऐण्ड ग्रैन्ड संस, जतनबर, वाराणसी, 1972
4. डॉ. वेद प्रकाश वर्मा, धर्म–दर्शन की मूल समस्या, हिन्दी माध्यम कार्यान्वयन निदेशालय, दिल्ली विश्वविद्यालय, 2012
5. डॉ. शिवभानु सिंह, धर्म–दर्शन का आलोचनात्मक अध्ययन, शारदा पुस्तक भवन, इलाहाबाद, 2010
6. John H. Hick, Philosophy of Religion, Pearson, 4th Edition, 2015
7. Y. Masih, Introduction to Rligious Philosophy, Motilal Banarsidas, Delhi, 2002

Outcomes - This course will widen and sharpen the critical caliber of the students.

दर्शनशास्त्र **Philosophy**

एम. ए. तृतीय सेमेस्टर **M.A. III Semester**

Course	-	**Logic - I (तर्कशास्त्र - I)**
Types of Course	-	**Core Course (C.C.)**
Paper	-	**302**
Marks	-	**60 (Theory) + 40 (Internal Assessment) = 100**

Objective - Logic is essentially the study of reasoning or argumentation. This course aims at training the students to construct effective arguments that are useful in every field of endeavor as well as in everyday life. It will help students go to the direction of truth and keep away from falsehood.

इकाई – 1 Unit - I

तर्कशास्त्र – स्वरूप, क्षेत्र, युक्ति का स्वरूप, सत्यता और वैधता, निगमनात्मक एवं आगमनात्मक तर्कशास्त्र में अंतर। Logic - Nature, Scope, Nature of Argument, Truth and Validity, Difference in Deductive and Inductive Logic.

इकाई – 2 Unit - II

परिभाषा का अर्थ, परिभाषा के उद्देश्य, परिभाषा के प्रकार – ऐच्छिक, कोशीय, निश्चायक, सैद्धान्तिक, प्रेरक। Meaning of Definintion, Purpose of Definition, Types of Definition - Stipulative, Lexical, Precising, Theoretical, Persuasive.

इकाई – 3 Unit - III

तर्कवाक्य और वाक्य में अंतर, तर्कवाक्य का वर्गीकरण – निरुपाधिक, सोपाधिक, वैकल्पिक, निरुपाधिक तर्कवाक्यों का मानक आकार, परम्परागत विरोध वर्ग, विरोध के प्रकार – व्याघात, विपरीत, विरुद्ध, उपाश्रयण। Difference between Proposition and Sentence, Classification of Proposition - Categorical, Conditional, Disjunctive, Standard form of Categorical Proposition, Traditional Square of Opposition, Kinds of Relation of Opposition - Contradictory, Contrary, Sub-contrary, Subalternation.

इकाई – 4 Unit - IV

अनुमान – निगमनात्मक, आगमनात्मक, निगमनात्मक अनुमान के प्रकार – व्यवहित, अव्यवहित, सत्तात्मक तात्पर्य, सत्तात्मक दोष। Inference - Deductive, Inductive, Kinds of Deductive Inference - Mediate, Immediate, Existential Import, Existential Fallacy.

इकाई – 5 Unit - V

निरपेक्ष न्यायवाक्य – परिभाषा, अवस्था, आकृति, वेन रेखाचित्र, वैधता का नियम एवं तर्कदोष। Categorical Syllogism - Definition, Mood, Figure, Venn Diagram, Rules of Validity and fallacies.

उपयोगी ग्रंथ – **Suggested Readings :**

1. अविनाश तिवारी, तर्कशास्त्र के सिद्धान्त, सरस्वती प्रकाशन, प्रयागराज, 2016
2. संगमलाल पाण्डेय, तर्कशास्त्र का परिचय, एशिया बुक कम्पनी, इलाहाबाद, 2010
3. श्याम किशोर सेठ, तर्कशास्त्र, लोकभारती, इलाहाबाद, 2004
4. सुरेन्द्र बारलिंगे, तर्क–रेखा, राजस्थान हिंदी ग्रन्थ अकादमी, जयपुर, 1972
5. राजनारायण, प्रतीकात्मक तर्कशास्त्र, राजस्थान हिन्दी ग्रन्थ अकादमी, जयपुर, 1973
6. Irving M Copi, Symbolic Logic, Macmillan Publishing Co Inc., New York, 1979

Outcomes - This course will help students avoid making ordinary mistakes of reasoning. It also helps students to clearly understand conceptual relations, which in turn enhances their skills of writing and putting forth their thoughts in a systematic manner.

दर्शनशास्त्र **Philosophy**

एम. ए. तृतीय सेमेस्टर **M.A. III Semester**

Course	-	**Gandhian Philosophy (गाँधी दर्शन)**
Types of Course	-	**Discipline Centric Elective (D.C.E.)**
Paper	-	**303 (A)**
Marks	-	**60 (Theory) + 40 (Internal Assessment) = 100**

Objective - This course focuses on the life and thoughts of Gandhi. It touches upon his ideas regarding all important issues of life. The topics that it covers are Philosophical background of Gandhism, Religious background of Gandhism, Philosophical thoughts of Gandhi, economic thoughts of Gandhi, and so on.

इकाई – 1 Unit - I

गाँधीजी का जीवन परिचय, गाँधीवाद, गाँधीवाद की दार्शनिक पृष्ठभूमि, गाँधीवाद की धार्मिक पृष्ठभूमि, गाँधीवाद का उद्देश्य, गाँधीवाद की प्रासंगिकता। Life sketch of Gandhiji, Gandhism, Philosophical background of Gandhism, Religious backgruound of Gandhism, Objectives of Gandhism, Relevance of Gandhism.

इकाई – 2 Unit - II

गाँधीजी की सामाजिक विचारधारा – रामराज्य, वर्णव्यवस्था, स्वदेशी, शिक्षा, सर्वोदय। Social Thoghts of Gandhiji - Ramrajya, Varna-vyavastha, Swadeshi, Education, Sarvodaya.

इकाई – 3 Unit - III

गाँधीजी की राजनीतिक विचारधारा – दार्शनिक अराजकतावाद, राज्यविहीन प्रजातंत्र, विकेन्द्रीकरण, ग्रमीण स्वराज, सत्याग्रह। Philosophical Thoughts of Gandhiji - Philosophical Anarchism, Stateless Democracy, Decentralization, Village Swaraj, Satyagrah.

इकाई – 4 Unit - IV

गाँधीजी की आर्थिक विचारधारा – मशीन युग का विरोध, ग्रामिण कुटीर उद्योग, प्रन्यास का सिद्धान्त, आर्थिक समाजवाद। Economic Thoughts of Gandhiji - Resist Machine Era, Rural Cottage Industries, Doctrine of Trusteeship, Economic Socialism.

इकाई – 5 Unit - V

गाँधीजी की धार्मिक विचारधारा – हिन्दू धर्म, धर्म–सहिष्णुता – सर्वधर्मसमभाव, धार्मिक एकता, गाँधीवाद का समाजवाद, गाँधीवाद एवं मार्क्सवाद, साधन और साध्य। Religious Thoughts of Gandhiji - Hindu Religion, Religious Tolerance - Sarvadharmasamabhava, Religious Unity, Socialism of Gandhism, Gandhism and Marxism, Means and End.

उपयोगी ग्रंथ – **Suggested Readings :**

1. बसन्त कुमार लाल, समकालीन भारतीय दर्शन, मोतीलाल बनारसीदास, दिल्ली, 1993
2. नन्द किशोर देवराज, भारतीय दर्शन, उत्तर प्रदेश हिन्दी ग्रन्थ अकादमी, लखनऊ, 1975
3. लक्ष्मी सक्सेना, समकालीन भारतीय दर्शन, उत्तर प्रदेश हिन्दी संस्थान, लखनऊ, 2002
4. डॉ. ए अवस्थी एवं डॉ. आर के अवस्थी, भारतीय राजनीतिक चिन्तन, रिसर्च पब्लिकेशन्स, जयपुर, 2001
5. N. K. Bose, Studies in Gandhism, Second Edition, Indian Association Publishing Co. Calcutta, 1947
6. D. M. Dutta, The Philosophy of Mahatma Gandhi, University of Calcutta, 1968
7. M. K. Gandhi, An Autobiography or the Story of my Experiments with Truth, Navajivan Pub. House, Ahmedabad, 1948

Outcomes - It will help students know Gandhism in a nutshell an induce them for further study in this field.

दर्शनशास्त्र **Philosophy**

एम. ए. तृतीय सेमेस्टर **M.A. III Semester**

Course	-	**Western Ethics (पाश्चात्य नीतिशास्त्र)**
Types of Course	-	**Discipline Centric Elective (D.C.E.)**
Paper	-	**303 (B)**
Marks	-	**60 (Theory) + 40 (Internal Assessment) = 100**

Objective - This course will familiarize students with the whole tradition of Western Ethics from Greek period to the time of Kant and several ethical theories put forward by Sophists, Socrates, Plato, Aristotle, Epicureans and Stoics. This course will also introduce the students with all types and branches of ethical theories advocated by Bentham, Mill, Hegel and Kant. This course will throw adequate light on Moral Egoism, Psychological Egoism, Moral Hedonism, Psychological Hedonism, Self-perfectionism and Utilitarianism.

इकाई – 1 Unit - I

नीतिशास्त्र – स्वरूप एवं क्षेत्र, नीतिशास्त्र एवं मनोविज्ञान, नीतिशास्त्र एवं समाजशास्त्र, नीतिशास्त्र एवं राजनीतिशास्त्र, नीतिशास्त्र एवं धर्म। Ethics - Nature and Scope, Ethics and Psychology, Ethics and Sociology, Ethics and Political Science, Ethics and Religion.

इकाई – 2 Unit - II

ग्रीक नैतिक दर्शन – सोफिस्ट, सुकरात, प्लेटो, अरस्तू, एपिक्यूरियनवाद एवं स्टोइकवाद। Greek Moral Philosophy - Sophist, Socrates, Plato, Aristotle, Epicureanism and Stoicism.

इकाई – 3 Unit - III

स्वार्थवाद – स्वरूप, नैतिक स्वार्थवाद, मनोवैज्ञानिक स्वार्थवाद, सुखवाद – स्वरूप, नैतिक सुखवाद, मनोवैज्ञानिक सुखवाद। Egoism - Nature, Moral Egoism, Psychological Egoism, Hedonism - Nature, Moral Hedonism, Psychological Hedonism.

इकाई – 4 Unit - IV

उपयोगितावाद – स्वरूप, बेन्थम, मिल, आत्मपूर्णतावाद – हेगल, अन्तःप्रज्ञावाद का स्वरूप। Utilitarianism - Nature, Bentham, Mill, Self-perfectionism - Hegel, Nature of Intuitionism.

इकाई – 5 Unit - V

कान्ट – शुभ संकल्प का स्वरूप, कर्तव्य का स्वरूप, निरपेक्ष आदेश, मुख्य नैतिक नियम, नैतिकता की पूर्वमान्यताएँ। Kant - Nature of Good Will, Nature of Duty, Categorical Imperative, Main Moral Norms, Postulates of Morality.

उपयोगी ग्रंथ – **Suggested Readings :**

1. डॉ. नित्यानंद मिश्र, नीतिशास्त्र (सिद्धान्त तथा प्रयोग), मोतीलाल बनारसीदास, दिल्ली, 2005
2. डॉ. वेद प्रकाश वर्मा, नीतिशास्त्र के मूल सिद्धान्त, एलाइड पब्लिकेशन, दिल्ली, 1977
3. डॉ. अशोक कुमार वर्मा, नीतिशास्त्र के सिद्धान्त, मोतीलाल बनारसीदास, दिल्ली, 1977
4. संगमलाल पाण्डेय, नीतिशास्त्र का सर्वेक्षण, सेन्ट्रल पब्लिशिंग हाऊस, इलाहाबाद, 2005
5. डॉ. डी. आर. जाटव, नीतिशास्त्र के प्रमुख सिद्धान्त, मलिक एण्ड कम्पनी, जयपुर, 2006
6. Peter Singer, Practical Ethics, Cambridge University, Cambridge, 2011
7. Simon Blackburn, Ethics A very short Introduction, Oxford University Press, 2001

Outcomes - Having studied and imbibed all these tenets and moral theories the students may become good moral preceptors and thus shape a moral society.

दर्शनशास्त्र **Philosophy**

एम. ए. तृतीय सेमेस्टर **M.A. III Semester**

Course	-	**Indian Ethics (भारतीय नीतिशास्त्र)**
Types of Course	-	**Generic Elective (G.E.)**
Paper	-	**304**
Marks	-	**60 (Theory) + 40 (Internal Assessment) = 100**

Objective - The objective of teaching this course to the students is to train and inspire them to learn and discriminate the ethical theories of Jaina and Buddhist. It will also teach concept of four Purusharthas, four Ashramas, sixteen Samskaras, Gita etc.

इकाई – 1 Unit - I

भारतीय नैतिक दर्शन का विकास, भारतीय नीतिशास्त्र की पूर्वमान्यताएँ, भारतीय नीतिशास्त्र के मूल प्रत्यय, ऋत की अवधारणा, चार्वाक दर्शन – सुखवाद। Development of Indian Ethics, Pre-suppositions of Indian Ethics, Fundamental Elements of Indian Ethics, Concept of Rita, Charvaka Philosophy - Hedonism.

इकाई – 2 Unit - II

जैन नीतिशास्त्र – पंचमहाव्रत, समिति, परीषहजय, त्रिरत्न, अनुप्रेक्षा, बौद्ध नीतिशास्त्र – अष्टांग मार्ग, पारमिता, ब्रह्म विहार। Jaina Ethics - Panchmahavrata, Samiti, Parishahjaya, Triratna, Anupreksha, Bauddhist Ethics - Eight fold path, Parmita, Brahma Vihar.

इकाई – 3 Unit - III

पुरुषार्थ – अवधारणा, महत्व, धर्म, अर्थ, काम, मोक्ष। Purushartha - Concept, Importance, Dharma, Artha, Kama, Moksha.

इकाई – 4 Unit - IV

संस्कार – अर्थ, महत्व, सोलह संस्कार, विवाह के प्रकार, गीता – कर्मयोग, स्थितप्रज्ञ। Sanskara - Meaning, Importance, Sixteen Sanskara, Types of Marriage, Gita - Karmayoga, Sthitprajna.

इकाई – 5 Unit - V

वर्ण–व्यवस्था – महत्व, ब्राह्मण, क्षत्रिय, वैश्य, शूद्र, आश्रम व्यवस्था – महत्व, ब्रह्मचर्य, गृहस्थ, वानप्रस्थ, संन्यास। Varna-vyavastha - Importance, Brahmana, Kshatriya, Vaishya, Shudra, Ashram-vyavastha - Importance, Brahmacharya, Grihastha, Vanaprastha, Sannyasa.

उपयोगी ग्रंथ – **Suggested Readings :**

1. डॉ. चन्द्रधर शर्मा, भारतीय दर्शन अलोचन और अनुशीलन, मोतीलाल बनारसीदास, दिल्ली 1995
2. डॉ. बी.एन. सिंह एवं डॉ. आशा सिंह, भारतीय दर्शन, स्टूडेण्ट्स फ्रेण्ड्स एण्ड कम्पनी, 1996
3. प्रो. हरेन्द्र प्रसाद सिन्हा, भारतीय दर्शन की रूपरेखा, मोतीलाल बनारसीदास, दिल्ली, 1963
4. बलदेव उपाध्याय, भारतीय दर्शन, शारदा मन्दिर वाराणसी, 1997
5. नन्द किशोर देवराज, भारतीय दर्शन, उत्तर प्रदेश हिन्दी ग्रन्थ अकादमी, लखनऊ, 1975
6. डॉ. श्रीकान्त मिश्र, भारतीय नीतिशास्त्र, आशा पब्लिशिंग कम्पनी, आगरा, 2018
7. Dutta & Chatterjee, An Introduction to Indian Philosophy, University of Calcutta, 1968.
8. M. Hiriyanna, Outlines of Indian Philosophy, George Allen and Unwin, London, 1932.

Outcomes - This course will help students learn ethical values which will promote a morally good society all around.

दर्शनशास्त्र **Philosophy**

एम. ए. तृतीय सेमेस्टर **M.A. III Semester**

Course	-	**Comprehensive Viva-voce**
Types of Course	-	**Core Course (C.C.)**
Paper	-	**305**
Marks	-	**100 (Minimum Passing Marks = 35)**

Objective - Students will be able to learn communication skills through viva-voce.

Comprehensive Viva-voce will be based on entire course of M. A. Third Semester, Philosophy.

विशद् मौखिकी परीक्षा एम. ए. तृतीय सेमेस्टर दर्शनशास्त्र के सम्पूर्ण पाठ्यक्रमों पर आधारित होगी।

Outcomes - Students will find themselves prepared for interviews.

दर्शनशास्त्र **Philosophy**

एम. ए. चतुर्थ सेमेस्टर **M.A. IV Semester**

Course	-	**Philosophy of Religion - II (धर्म दर्शन - II)**
Types of Course	-	**Core Course (C.C.)**
Paper	-	**401**
Marks	-	**60 (Theory) + 40 (Internal Assessment) = 100**

Objective - Man has created different religions and each and every religion has the same ultimate reality as its goal. This course aims at providing the concepts of all important religions of the world so that students may have a better understanding about them.

इकाई – 1 Unit - I

ईश्वर के अस्तित्व हेतु प्रमाण – तात्त्विक युक्ति – स्वरूप, आलोचना, विश्व–सम्बन्धी युक्ति – स्वरूप, आलोचना, प्रयोजनमूलक युक्ति – स्वरूप, आलोचना, नैतिक युक्ति – स्वरूप, आलोचना। Arguments for the existence of God - Ontological Argument - Nature, Criticism, Cosmological Argument - Nature, Criticism, Taleological Argument -Nature, Criticism, Moral Argument - Nature, Criticism.

इकाई – 2 Unit - II

अशुभ की समस्या – स्वरूप, प्रकार, ईश्वरवाद एवं अशुभ, अमरत्व – स्वरूप, प्रकार, अमरत्व के प्रमाण, अमरता के विरुद्ध युक्तियाँ। Problem of Evil - Nature, Types, Theism and Evil, Immortality - Nature, Forms, Proof for Immortality, Arguments against Immortality.

इकाई – 3 Unit - III

रहस्यवाद – स्वरूप, विशेषताएँ, मूल्यांकन, धार्मिक ज्ञान का स्वरूप, धार्मिक विश्वास – स्वरूप, आधार, विश्वास और आस्था। Mysticism - Nature, Characteristics, Evaluation, Nature of Religious Knowledge, Religios Belief - Nature, Foundations, Belief and Faith.

इकाई – 4 Unit - IV

धर्म परिवर्तन – स्वरूप, प्रकार, धार्मिक सहिष्णुता का स्वरूप, धर्मनिरपेक्षतावाद, धर्मनिरपेक्ष समाज का स्वरूप। Conversion - Nature, Types, Nature of Religious Tolerance, Secularism, Nature of Secular Society.

इकाई – 5 Unit - V

विश्व–धर्म – अर्थ, प्रासंगिकता, सम्भावना, धर्म में ईश्वर का स्थान, व्यक्तित्व एवं ईश्वर। Universality of Religion - Meaning, Relevence, Possibility, The Place of God in Religion, Personality and God.

उपयोगी ग्रंथ – **Suggested Readings :**

1. डॉ हरेन्द्र प्रसाद सिन्हा, धर्म–दर्शन की रूपरेखा, मोतीलाल बनारसीदास, पटना, 2017
2. डॉ बी. एन. सिंह, धर्म–दर्शन, स्टूडेण्ट्स फ्रेन्ड्स एण्ड कम्पनी, वाराणसी, 1989
3. एल. एन. शर्मा, धर्म–दर्शन, गंगासरन ऐण्ड ग्रैन्ड संस, जतनबर, वाराणसी, 1972
4. डॉ. वेद प्रकाश वर्मा, धर्म–दर्शन की मूल समस्या, हिन्दी माध्यम कार्यान्वयन निदेशालय, दिल्ली विश्वविद्यालय, 2012
5. डॉ. शिवभानु सिंह, धर्म–दर्शन का आलोचनात्मक अध्ययन, शारदा पुस्तक भवन, इलाहाबाद, 2010
6. John H. Hick, Philosophy of Religion, Pearson, 4th Edition, 2015
7. Y. Masih, Introduction to Rligious Philosophy, Motilal Banarsidas, Delhi, 2002

Outcomes - It will make students become better human beings. They will, hopefully, be better equipped to establish harmony in different religions of the world.

दर्शनशास्त्र **Philosophy**

एम. ए. चतुर्थ सेमेस्टर **M.A. IV Semester**

Course	-	**Logic - II (तर्कशास्त्र - II)**
Types of Course	-	**Core Course (C.C.)**
Paper	-	**402**
Marks	-	**60 (Theory) + 40 (Internal Assessment) = 100**

Objective - Logic plays an important role in our day to day life. When thoughts are logical they are received well and give a strong footing to our concepts. Concepts based on Logic are mean to be more convincing and acceptable in our society. This course aims at teaching students different structures of logic formed in different kinds of sentences and make them well footed in the labyrinth of logic.

इकाई – 1 Unit - I

प्रतीकात्मक तर्कशास्त्र का स्वरूप, सरल एवं मिश्र वाक्य, संयोजन, सत्यता मूल्य, निषेध कथन का सत्यता मूल्य, विकल्पन। Nature of Symbolic Logic, Simple and Compound Statements, Conjunction, Truth Value, Truth Value of Negative Statement, Disjunction.

इकाई – 2 Unit - II

सोपाधिक कथन, शाब्दिक प्रतिपत्ति एवं वास्तविक प्रतिपत्ति में सम्बन्ध, शाब्दिक प्रतिपत्त का विरोधाभास, शाब्दिक प्रतिपत्ति एवं आकारिक प्रतिपत्ति में अंतर, युक्ति और युक्ति आकार, सत्यता सारिणी बनाने की विधि, युक्तियों की वैधता और सत्यता सारिणी। Conditional Statement, Relation between Material and Real Implication, Paradoxes of Material Implication, Difference between Material Implication and Formal Implication, Arguments and Argument Forms, Method of Making Truth Table, Validity of Arguments and Truth Table.

इकाई – 3 Unit - III

वाक्य और वाक्य–आकार, विशिष्ट आकार एवं वाक्य–आकार में अंतर, शाब्दिक सम एवं तार्किक सम, पुनर्कथनात्मक प्रतिपत्ति एवं समता, युक्ति और पुनर्कथन में सम्बन्ध। Statements and Statement Forms, Difference between Specific Form and statement Form, Material Equivalence and Logical Equivalence, Tautological Implication and Equivalence, Relation between Argument and Tautology.

इकाई – 4 Unit - IV

विचार के नियम – तादात्म्य का नियम, व्याघात का नियम, मध्य–परिहार का नियम, विचार के नियमों की आलोचना, सादृश्यानुमान का स्वरूप। Laws of Thought - Law of Identity, Law of Contradiction, Law of Excluded middle, Criticism of Laws of Thought, Nature of Analogy.

इकाई – 5 Unit - V

मिल की प्रायोगिक विधि – अन्वय, व्यतिरेक, अन्वय–व्यतिरेक, सहचारी परिवर्तन, अवशेष विधि। Experimental Method of Mill - Agreement, Difference, Agreement and Difference, Concomitant Verification, Method of Residues.

उपयोगी ग्रंथ – **Suggested Readings :**

1. अविनाश तिवारी, तर्कशास्त्र के सिद्धान्त, सरस्वती प्रकाशन, इलाहाबाद, 2016
2. संगमलाल पाण्डेय, तर्कशास्त्र का परिचय, एशिया बुक कम्पनी, इलाहाबाद, 2010
3. श्याम किशोर सेठ, तर्कशास्त्र, लोकभारती, इलाहाबाद, 2004
4. सुरेन्द्र बारलिंगे, तर्क–रेखा, राजस्थान हिंदी ग्रन्थ अकादमी, जयपुर, 1972
5. राजनारायण, प्रतीकात्मक तर्कशास्त्र, राजस्थान हिन्दी ग्रन्थ अकादमीए जयपुर, 1973
6. Irving M Copi, Symbolic Logic, Macmillan Publishing Co Inc., New York, 1979

Outcomes - Students will be well equipped to understand various structures of logic through this course.

दर्शनशास्त्र **Philosophy**

एम. ए. चतुर्थ सेमेस्टर **M.A. IV Semester**

Course	-	**Contemporary Indian Philosophy (समकालीन भारतीय दर्शन)**
Types of Course	-	**Discipline Centric Elective (D.C.E.)**
Paper	-	**403 (A)**
Marks	-	**60 (Theory) + 40 (Internal Assessment) = 100**

Objective - This course will teach the contributions made by Vivekananda, Tagore, Gandhi, Sri Aurobindo and Radhakrishnan and to inspire them to emulate the achievements of these stalwarts.

इकाई – 1 Unit - I

स्वामी विवेकानन्द – जीवन परिचय, सत् एवं ईश्वर, जगत् का स्वरूप, माया–सिद्धान्त, मानव का स्वरूप, धर्म का स्वरूप, व्यावहारिक वेदान्त। Swami Vivekananda - Life Sketch, Sat and God, Nature of World, Maya Theory, Nature of Human, Nature of Religion, Practical Vedanta.

इकाई – 2 Unit - II

रबीन्द्रनाथ टैगोर – सत् एवं ईश्वर, जगत्/सृष्टि का स्वरूप, माया, मानव का स्वरूप, धर्म का स्वरूप, मानववाद। Rabindranath Tagore - Sat and God, Nature of World, Maya, Nature of Human, Nature of Religion, Humanism.

इकाई – 3 Unit - III

महात्मा गाँधी – अन्य विचारों का प्रभाव, ईश्वर एवं सत्य, जगत् का स्वरूप, मानव का स्वरूप, कर्म एवं पुनर्जन्म, साधन–साध्य, धर्म एवं नैतिकता। Mahatma Gandhi - Influence of Other Thoughts, God and Truth, Nature of World, Nature of Human, Karma and Rebirth, Means-End, Religion and Morality.

इकाई – 4 Unit - IV

श्री अरबिन्द – जीवन परिचय, सृष्टि/जगत् का स्वरूप, कर्म एवं पुनर्जन्म, अज्ञान का स्वरूप, अतिमानस, पूर्ण अद्वैत योग। Sri Aurobindo - Life Sketch, Nature of World, Karma and Rebirth, Nature of Ignorance, Super Mind, Integral Yoga.

इकाई – 5 Unit - V

राधाकृष्णन् – जीवन परिचय, निरपेक्ष/परम सत् का स्वरूप, निरपेक्ष सत् एवं ईश्वर, जगत् का स्वरूप, आत्म का स्वरूप, पुनर्जन्म का सिद्धान्त। Radhakrishnan - Life Sketch, Nature of Absolute, Absolute and God, Nature of World, Nature of Self, Theory of Rebirth.

उपयोगी ग्रंथ – **Suggested Readings :**

1. बसन्त कुमार लाल, समकालीन भारतीय दर्शन, मोतीलाल बनारसीदास, दिल्ली, 1993
2. नन्द किशोर देवराज, भारतीय दर्शन, उत्तर प्रदेश हिन्दी ग्रन्थ अकादमी, लखनऊ, 1975
3. समकालीन भारतीय दर्शन, लक्ष्मी सक्सेना, उत्तर प्रदेश हिन्दी संस्थान, लखनऊ, 2002
4. डॉ. ए अवस्थी एवं डॉ. आर के अवस्थी, भारतीय राजनीतिक चिन्तन, रिसर्च पब्लिकेशन्स, जयपुर, 2001
5. N. K. Bose, Studies in Gandhism, Second Edition, Indian Association Publishing Co. Calcutta, 1947
6. V. S. Narvane, Rabindranathe Tagore, a Philosophical Study, Allahabad Central Book Depot, 1947
7. V. S. Narvane, Modern Indian Thought, Asia Publishing House, Bombay, 1964
8. Binay Gopal Ray, Contemporary Indian Philosophers, Kitabistan, Allahabad, 1957

Outcomes - This course will help our students to come forward with convincing and appealing interpretations of our glorious philosophical tradition.

दर्शनशास्त्र **Philosophy**

एम. ए. चतुर्थ सेमेस्टर **M.A. IV Semester**

Course	-	**Contemporary Western Philosophy (समकालीन पाश्चात्य दर्शन)**
Types of Course	-	**Discipline Centric Elective (D.C.E.)**
Paper	-	**403 (B)**
Marks	-	**60 (Theory) + 40 (Internal Assessment) = 100**

Objective - This course aims at teaching the theories of Bradley, Moore, Ayer, Wittgenstein, Russell, Husserl, and such contemporary philosophers. The topics that it covers are Theories of Meaning, Analytic Philosophy, Existentialism and so on so forth.

इकाई – 1 Unit - I

एफ. एच. ब्रेडले – आभास और सत् की समस्या, सत् का स्वरूप, उपयोगितावाद – चार्ल्स सैन्डर्स पर्स – अर्थ का सिद्धान्त, विलियम जेम्स – उत्कट अनुभववाद, जॉन डुवी – उपकरणवाद, शिलर – मानववाद। F. H. Bradley - Problem of Appearance and Reality, Nature of Reality, Charls Sanders Peirce - Theory of Meaning, William Jems - Redical Experience, John Dewey - Instrumentalism, Schiller - Humanism.

इकाई – 2 Unit - II

जी ई. मूर – 'दृश्यते अनेन इति वर्तते' का खण्डन, इन्द्रिय–प्रदत्त दर्शन, सम्बन्ध का स्वरूप, बट्रेन्ड रसेल – साक्षात् परिचय ज्ञान एवं विवरण ज्ञान, तार्किक अणुवाद। G.E. Moore - Refutation of Esse est percipi, Philosophy of Sense Data, Nature of Relation, Bertrand Rusell - Knowledge by Acquaintance and knowledge by Description, Logical Atomism.

इकाई – 3 Unit - III

तार्किक भाववाद – अर्थ सिद्धान्त, तत्त्वमीमांसा का निरसन, दर्शन का भावात्मक कार्य, ए. जे. एयर – सत्यापन सिद्धान्त। Logical Positivism - Theory of Meaning, Elimination of Metaphysics, Positive Function of Philosophy, A.J. Ayer - Principle of Verification.

इकाई – 4 Unit - IV

लु. विट्गेन्सटाइन – ट्रैक्टेटस का सामान्य परिचय, जगत्, तथ्य तथा विषय, 'जो कहा जा सकता है तथा जिसे दिखाया जा सकता है', अर्थ एवं प्रयोग। L. Wittgenstein - A General Intriduction of Tractatus, World, Facts and Objects, What can be said and What can be shown, Meaning and Use.

इकाई – 5 Unit - V

विश्लेषणात्मक दर्शन – परिचय, हुसर्ल की फेनामेनोलॉजी – परिचय, अस्तित्वावाद – जां पाल सार्त्र – अस्तित्व भाव से पहले है, चेतना तथा निषेधभाव, आत्म प्रवंचना। Analytic Philosophy - Introduction, Phenomenology of Edmund Husserl - Introduction, Existentialism - Jaun Paul Sartre - Existence Precedes Essence, Consciousness and Nothingness, Bad Faith.

उपयोगी ग्रंथ – **Suggested Readings :**

1. बसन्त कुमार लाल, समकालीन पाश्चात्य दर्शन, मोतीलाल बनारसीदास, दिल्ली, 1990
2. समकालीन पाश्चात्य दर्शन, लक्ष्मी सक्सेना, उत्तर प्रदेश हिन्दी संस्थान, लखनऊ, 1987
3. D. Pole, The Later Philosophy of Wittgenstein, Athbone Press, London, 1958
4. J. L. Austin, Philosophical Papers (Warnock and Urmson Ed) Oxford Clarendon Press, 1961
5. A. J. Ayer, Origin of Pragmatism, Mac Millan & Co. Ltd, London, Melbourn, Toranto, 1968
6. A. C. Ewing, Idealism, a critical survey, London, 1949

Outcomes - This course will make students acquainted with insightful and motivating thoughts of contemporary philosophers and induce them for further study in this field.

दर्शनशास्त्र **Philosophy**

एम. ए. चतुर्थ सेमेस्टर **M.A. IV Semester**

Course	-	**Vedanta Darshan (वेदान्त दर्शन)**
Types of Course	-	**Generic Elective (G.E.)**
Paper	-	**404**
Marks	-	**60 (Theory) + 40 (Internal Assessment) = 100**

Objective - This course aims at enriching students with the entire tradition of Vedanta Philosophy within the fold of classical Indian Philosophy. The students will get an opportunity to study the thoughts of Shankar, Ramanuja, Madhva, Nimbarka, Vallabha, Chaitanya Mahaprabhu, Jiva Goswami on Jiva, Jagat and Moksha.

इकाई – 1 Unit - I

रामानुज – विशिष्टाद्वैत का अर्थ, ईश्वर का स्वरूप, ईश्वर का जीव एवं जगत् से सम्बन्ध, मायावाद की आलोचना – सप्तविध अनुपपत्तियाँ, मोक्ष – स्वरूप, साधन। Ramanuja - Meaning of Vishishtadvaita, Nature of God, Relation to Jiva and jagat of God, Criticism of Mayavada - Saptvidh Anuppattiyan, Moksha - Nature, MeanS.

इकाई – 2 Unit - II

मध्वाचार्य – ज्ञान का स्वरूप, प्रमाण, द्वैतवाद, सत्कार्यवाद और परिणामवाद, जगत् का स्वरूप, जीव का स्वरूप, मोक्ष। Madhvacharya - Nature of Knowledge, Pramana, Dvaitavada, Satkaryavada and Parinamavada, Nature of the world, Nature of Jiva, Moksha.

इकाई – 3 Unit - III

निम्बार्क – ज्ञान का स्वरूप, भेदाभेदवाद, कारणकार्य सिद्धान्त, जगत् का स्वरूप, मोक्ष। Nimbarka - Nature of Knowledge, Bhedabhedvada, Causation Theory, Nature of the World, Moksha.

इकाई – 4 Unit - IV

वल्लभ – ज्ञान का स्वरूप, शुद्धाद्वैतवाद, कारण कार्य सिद्धान्त, मोक्ष। Vallabha - Nature of Knowledge, Shuddhadvaitavada, Causation Theory, Moksha.

इकाई – 5 Unit - V

चैतन्य महाप्रभु – अचिन्त्य भेदाभेदवाद, चैतन्य के अनुयायियों का मत – कृष्णदास, जीव गोस्वामी, बलदेव विद्याभूषण, वैष्णव वेदान्त की तुलना। Chaitanya Mahaprabhu - Achintybhedabhedvada, Opinion of Chaitanya's Disciple's - Krishnadasa, Jiv Goswami, Baladev Vidyabhushana, Comparative study of Vaishnava Vedanta.

उपयोगी ग्रंथ – **Suggested Readings :**

1. डॉ. चन्द्रधर शर्मा, भारतीय दर्शन अलोचन और अनुशीलन, मोतीलाल बनारसीदास, दिल्ली 1995
2. डॉ. बी.एन. सिंह एवं डॉ. आशा सिंह, भारतीय दर्शन, स्टूडेण्ट्स फ्रेण्ड्स एण्ड कम्पनी, 1996
3. प्रो. हरेन्द्र प्रसाद सिन्हा, भारतीय दर्शन की रूपरेखा, मोतीलाल बनारसीदास, दिल्ली, 1963
4. बलदेव उपाध्याय, भारतीय दर्शन, शारदा मन्दिर वाराणसी, 1997
5. नन्द किशोर देवराज, भारतीय दर्शन, उत्तर प्रदेश हिन्दी ग्रन्थ अकादमी, लखनऊ, 1975
6. डॉ. श्रीकान्त मिश्र, भारतीय नीतिशास्त्र, आशा पब्लिशिंग कम्पनी, आगरा, 2018
7. Dutta & Chatterjee, An Introduction to Indian Philosophy, University of Calcutta, 1968.
8. M. Hiriyanna, Outlines of Indian Philosophy, George Allen and Unwin, Lodon-1932.

Outcomes - Students will develop critical insights about different schools of Vedanta Philosophy.

दर्शनशास्त्र **Philosophy**

एम. ए. चतुर्थ सेमेस्टर **M.A. IV Semester**

Course	-	**Comprehensive Viva-voce**
Types of Course	-	**Core Course (C.C.)**
Paper	-	**405**
Marks	-	**100 (Minimum Passing Marks = 35)**

Objective - Students will be able to learn communication skills through viva-voce.

Comprehensive Viva-voce will be based on entire course of M. A. Fourth Semester, Philosophy.

विशद् मौखिकी परीक्षा एम. ए. चतुर्थ सेमेस्टर दर्शनशास्त्र के सम्पूर्ण पाठ्यक्रमों पर आधारित होगी।

Outcomes - Students will find themselves prepared for interviews.

अवधेश प्रताप सिंह विश्वविद्यालय, रीवा (म.प्र.)

एम.ए. हिन्दी समसत्र **(Semester)** पद्धति

(C.B.C.S.)

हिन्दी **(Hindi)**

2020-2021

प्रकाशक

कुलसचिव

अवधेश प्रताप सिंह विश्वविद्यालय, रीवा (म.प्र.)

एम.ए. हिन्दी

निर्धारित पाठ्यक्रम

समसत्र (प्रथम, द्वितीय, तृतीय एव चतुर्थ)

(C.B.C.S.)

प्रथम सेमेस्टर :-

प्रश्न–पत्र 01 :– प्राचीन एवं मध्यकालीन काव्य तथा उसका इतिहास	**(101) - CC**
प्रश्न–पत्र 02 :– आधुनिक हिन्दी गद्य और उसका इतिहास	**(102) - CC**
प्रश्न–पत्र 03 :– भारतीय एवं पाश्चात्य काव्य शास्त्र	**(103) - CC**
प्रश्न–पत्र 04 :– प्रयोजन मूलक हिन्दी	**(104) - GE**
प्रश्न–पत्र 05 :– समग्र मौखिकी	**(105) - CC**

द्वितीय सेमेस्टर :-

प्रश्न–पत्र 01 :– प्राचीन एवं मध्यकालीन काव्य तथा उसका इतिहास	**(201) - CC**
प्रश्न–पत्र 02 :– आधुनिक हिन्दी गद्य और उसका इतिहास	**(202) - CC**
प्रश्न–पत्र 03 :– भारतीय एवं पाश्चात्य काव्य शास्त्र	**(203) - CC**
प्रश्न–पत्र 04 :– प्रयोजन मूलक हिन्दी	**(204) - GE**
प्रश्न–पत्र 05 :– समग्र मौखिकी	**(205) - CC**

तृतीय सेमेस्टर :-

प्रश्न–पत्र 01 :– आधुनिक हिन्दी काव्य और उसका इतिहास	**(301) - CC**
प्रश्न–पत्र 02 :– भाषा विज्ञान एवं हिन्दी भाषा	**(302) - CC**
प्रश्न–पत्र 03 :– हिन्दी साहित्य का इतिहास	**(303) - CC**
प्रश्न–पत्र 04 :– वैकल्पिक प्रश्न–पत्र (सूरदास, तुलसीदास, बघेली भाषा और उसका साहित्य)	**(304) - GE**
प्रश्न–पत्र 05 :– समग्र मौखिकी	**(305) - CC**

चतुर्थ सेमेस्टर :-

प्रश्न–पत्र 01 :– आधुनिक हिन्दी काव्य और उसका इतिहास	**(401) - CC**
प्रश्न–पत्र 02 :– भाषा विज्ञान एवं हिन्दी भाषा	**(402) - CC**
प्रश्न–पत्र 03 :– हिन्दी साहित्य का इतिहास	**(403) - CC**
प्रश्न–पत्र 04 :– वैकल्पिक प्रश्न–पत्र (सूरदास, तुलसीदास, बघेली भाषा और उसका साहित्य)	**(404) - GE**
प्रश्न–पत्र 05 :– समग्र मौखिकी	**(405) - CC**

एम.ए. हिन्दी, प्रथम समसत्र

प्रश्न-पत्र (प्रथम)

प्राचीन एवं मध्यकालीन काव्य तथा उसका इतिहास

(CC-101)

पूर्णांक : 60

आंतरिक मूल्यांकन : 40

उद्देश्य : यह प्रश्न–पत्र पढ़ाने का उद्देश्य यह है कि विद्यार्थी हिन्दी के प्राचीन एवं मध्यकालीन कवियों एवं काव्य से परिचित हो सकें। आदिकालीन काव्य अपभ्रंश के अवदान को समेटे है। मध्यकालीन काव्य लोकमंगल के स्वर साधता है। इसने भारत की भावनात्मक एकता और सांस्कृतिक परम्परा को सुरक्षित रखा है।

पाठ्य विषय :

इकाई 01 : **2x10=20**

1. विद्यापति – 20 पद (विद्यापति पदावली संपा. रामवृक्ष बेनीपुरी, लोकभारती प्रकाशन, प्रयागराज)
   पद क्रमांक– 1, 4, 5, 7, 8, 11, 12, 14, 15, 16, 20, 22, 23, 26, 27, 28, 29, 31, 33, 43
2. कबीर – कबीर ग्रंथावली, डॉ. श्यामसुन्दर दास
   गुरुदेव को अंग (साखी क्रमांक 1 से 10), सुमिरण को अंग (साखी क्रमांक 1 से 10), विरह को अंग (साखी क्रमांक 1 से 10), 'कबीर' हजारी प्रसाद द्विवेदी से 160वें पद से 175वें पद तक।
3. जायसी – पद्मावत, संपा. आचार्य रामचंद्र शुक्ल
   (मानसरोदक खण्ड एवं नागमती वियोग खण्ड)

इकाई–02 : **2x5=10**

विद्यापति, कबीर और जायसी से संबंधित आलोचनात्मक प्रश्न।

इकाई–03 : **2x5=10**

प्राचीनकाल एवं मध्यकालीन काव्य (निर्गुण धारा) का इतिहास, प्रमुख प्रवृत्तियाँ एवं रचनाकारों से संबंधित प्रश्न।

इकाई–04 : **2x5=10**

द्रुतपाठ के कवि–चंदबरदाई, अमीर खुसरो, रैदास, मीराबाई, रहीम से संबंधित लघुउत्तरीय प्रश्न।

इकाई–05 : वस्तुनिष्ठ प्रश्न (सम्पूर्ण पाठ्यक्रम से) **10x1=10**

संदर्भ ग्रंथ :–

1. कबीर ग्रंथावली सटीक, प्रो. पुष्पपाल सिंह, अशोक प्रकाशन दिल्ली।
2. हिन्दी के प्राचीन प्रतिनिधि कवि, लेखक द्वारका प्रसाद सक्सेना, प्रकाशन श्री विनोद पुस्तक मंदिर, आगरा–2।
3. हिन्दी साहित्य का इतिहास, लेखक रामचन्द्र शुक्ल, प्रकाशक राजकमल प्रकाशन।
4. प्राचीन एवं मध्यकालीन हिन्दी काव्य, लेखक प्रो. पूरनचंद टण्डन, प्रकाशक राजपाल एण्ड संस।
5. प्राचीन कवि, लेखक विश्वरम्भर 'मानव', प्रकाशक लोकभारती प्रकाशन, इलाहाबाद।

एम.ए. हिन्दी, प्रथम समसत्र
प्रश्नपत्र-द्वितीय
आधुनिक हिन्दी गद्य और उसका इतिहास

(CC-102)

पूर्णांक : 60

आंतरिक मूल्यांकन : 40

उद्देश्य : विद्यार्थियों को इस बात से परिचित कराना कि मनुष्य के राग–विराग, तर्क–वितर्क, चिन्तन–मनन जिस रागात्मकता तथा कौशलपूर्ण ढंग से गद्य में अभिव्यंजित होते हैं अन्यत्र नहीं।

पाठ्य विषय :–

इकाई–01 : **2x10=20**

1. चंद्रगुप्त : जयशंकर प्रसाद
2. आधे–अधूरे : मोहन राकेश
3. गोदान : प्रेमचंद

इकाई–02 : **2x5=10**

चंद्रगुप्त, आधे–अधूरे एवं गोदान से समीक्षात्मक प्रश्न

इकाई–03 : **2x5=10**

हिन्दी नाटक, रंगमंच एवं उपन्यास के इतिहास की विविध प्रवृत्तियाँ और रचनाकारों पर निबंधात्मक प्रश्न।

इकाई–04 : **2x5=10**

लघुत्तरीय प्रश्न–द्रुतपाठ में निर्धारित गद्यकारों से सम्बद्ध दो लघुत्तरीय प्रश्न होंगे।

1. नाटककार : भारतेन्दु हरीशचन्द्र, डॉ. रामकुमार वर्मा, जगदीशचन्द्र माथुर, धर्मवीर भारती, लक्ष्मीनारायण लाल।
2. उपन्यासकार : जैनेन्द्र, अमृतलाल नागर, निर्मल वर्मा, भीष्म साहनी, मन्नू भण्डारी।

इकाई–05 : **10x1=10**

वस्तुनिष्ठ प्रश्न (सम्पूर्ण पाठ्यक्रम से)

संदर्भ ग्रंथ :–

1. आधुनिक हिन्दी साहित्य का इतिहास, लेखक बच्चन सिंह, प्रकाशक लोकभारती प्रकाशन।
2. चन्द्रगुप्त, लेखक जयशंकर प्रसाद, प्रकाशक भारती भण्डार, लीडर प्रेस, प्रयागराज।
3. आधुनिक हिन्दी नाटक, डॉ. नगेन्द्र, साहित्य प्रेस आगरा।
4. मोहन राकेश और उनके नाटक, गिरीश रस्तोगी, लोकभारती प्रकाशन प्रयागराज।
5. प्रेमचंद और उनका युग, रामविलास शर्मा, प्रकाशक मेहरचन्द्र मुंशीराम फैजबाजार, दिल्ली।
6. जयशंकर प्रसाद, नंददुलारे वाजपेयी, प्रकाशक भारती भण्डार, प्रयागराज।

एम.ए. हिन्दी, प्रथम समसत्र
प्रश्न-पत्र-तृतीय
भारतीय एवं पाश्चात्य काव्यशास्त्र
(CC-103)

पूर्णांक : 80
आंतरिक मूल्यांकन : 40

उद्देश्य :– रचना के वैशिष्ट्य और मूल्यबोध के उद्घाटन के लिए काव्यशास्त्र और साहित्यलोचन का ज्ञान अपरिहार्य है।

पाठ्य विषय :–

इकाई–01 :

संस्कृत काव्यशास्त्र : काव्य–लक्षण, काव्य–हेतु, काव्य–प्रयोजन, काव्य के प्रकार।

रस सिद्धांत : रस का स्वरूप, रस–निष्पत्ति, रस के अंग, साधारणीकरण, सहृदय की अवधारणा।

अलंकार सिद्धांत : मूल स्थापनाएँ, अलंकारों का वर्गीकरण।

इकाई 02 :

रीति सिद्धांत : रीति की अवधारणा, काव्य–गुण, रीति एवं शैली, रीति सिद्धांत की प्रमुख स्थापनाएँ।

वक्रोक्ति सिद्धांत : वक्रोक्ति की अवधारणा, वक्रोक्ति के भेद, वक्रोक्ति एवं अभिव्यंजनावाद।

इकाई 03 :

ध्वनि सिद्धांत : ध्वनि का स्वरूप, ध्वनि–सिद्धांत की प्रमुख स्थापनाएँ, ध्वनि काव्य के प्रमुख भेद, गुणीभूत–व्यंग्य, चित्रकाव्य।

औचित्य सिद्धांत : प्रमुख स्थापनाएँ, औचित्य के भेद।

इकाई 04 :

हिन्दी 'कवि आचार्यों' का काव्य शास्त्रीय चिंतन। लक्षण–काव्य परंपरा एवं कवि–शिक्षा।

इकाई 05 :

हिन्दी आलोचना की प्रमुख प्रवृत्तियाँ : शास्त्रीय, व्यक्तिवाद, मार्क्सवादी, ऐतिहासिक, तुलनात्मक, मनोविश्लेषणवादी, सौन्दर्यशास्त्रीय, शैलीवैज्ञानिक और समाजशास्त्रीय।

(जारी.....)

आलोचनात्मक प्रश्न – **2x10=20** लघु उत्तरी प्रश्न – **5x6=30** वस्तुनिष्ठ प्रश्न – **10x1=10**

संदर्भ ग्रंथ :

1. भारतीय एवं पाश्चात्य काव्य सिद्धांत, लेखक डॉ. गणपतिचन्द्र गुप्त, प्रकाशक लोकभारती प्रकाशन।
2. काव्यशास्त्र, लेखक डॉ. भगीरथ मिश्र, प्रकाशक विश्वविद्यालय प्रकाशन वाराणसी।
3. भारतीय एवं पाश्चात्य काव्यशास्त्र, लेखक डॉ. विवेक शंकर, प्रकाशक राजस्थान हिन्दी ग्रंथ अकादमी।
4. भारतीय एवं पाश्चात्य काव्यशास्त्र की रूपरेखा, रामचन्द्र तिवारी।
5. साहित्य शास्त्र, लेखक आचार्य बलदेव उपाध्याय, प्रकाशक नंदकिशोर एण्ड सन्स, वाराणसी।
6. भारतीय काव्यशास्त्र, आचार्य देवेन्द्रनाथ शर्मा।
7. हिन्दी आलोचना शिखरों का साक्षात्कार, रामचन्द्र तिवारी, लोकभारती प्रकाशन, प्रयागराज।
8. भारतीय एवं पाश्चात्य काव्यशास्त्र तथा आलोचना, प्रो. योगेन्द्र प्रताप सिंह, श्यामा प्रकाशन संस्थान प्रयागराज।
9. पाश्चात्य काव्यशास्त्र : अधुनातन संदर्भ, डॉ. सत्यदेव मिश्रा।
10. वाद–विवाद संवाद नामवर सिंह, राजकमल प्रकाशन नई दिल्ली।
11. सौन्दर्य शास्त्र के तत्व, कुमार विमल, राजकमल प्रकाशन नई दिल्ली।

एम.ए. हिन्दी, प्रथम समसत्र
प्रश्न-पत्र-चतुर्थ
प्रयोजन मूलक हिन्दी
(GE-104)

पूर्णांक : 60
आंतरिक मूल्यांकन : 40

उद्देश्य :– भाषा के प्रयोजनपरक आयाम का संबंध हमारी सामाजिक आवश्यकताओं और जीवन व्यवहार से है। व्यक्तिपरक होकर भी यह समाज सापेक्ष सेवा माध्यम (सर्विसटूल्स) के रूप में प्रयुक्त होती है। इसके विविध आयामों से न केवल रोजगार की समस्या हल होगी अपितु राजभाषा तथा राष्ट्रभाषा का संस्कार की दृढ़ होगा।

पाठ्य विषय :–

इकाई 01 : कामकाजी हिन्दी

1. हिन्दी के विभिन्न रूप सर्जनात्मक भाषा, संचार भाषा, राष्ट्रभाषा, राजभाषा, माध्यम भाषा, मातृभाषा।
2. कार्यालयीन हिन्दी, राजभाषा के प्रमुख प्रकार्य– प्रारूपण, पत्र–लेखन, संक्षेपण, पल्लवन टिप्पणी।

इकाई 02 :

पारिभाषिक शब्दावली–स्वरूप एवं महत्व, पारिभाषिक शब्दावली के उदाहरण एवं उनका व्यावहारिक प्रयोग।

इकाई 03 : हिन्दी : कम्प्यूटर अनुप्रयोग

1. कम्प्यूटर : परिचय, रूपरेखा, उपयोग तथा बेब पब्लिशिंग का परिचय।
2. इंटरनेट, संपर्क उपकरणों का परिचय, प्रथामिक, रख–रखाव वं इंटरनेट, समय मितव्ययिता के सूत्र।
3. बेब पब्लिकेशन।
4. इंटर एक्सरलोइट अथवा नेट स्केप।
5. लिंक, ब्राउजिंग पोर्टल, ई.मेल भेजना/प्राप्त करना, हिन्दी के प्रमुख इंटरनेट पोर्टल, डाउलोडिंग एवं अपलोडिंग का साफ्टवेयर, पैकेज।

इकाई 04 :

1. पत्रकारिता स्वरूप एवं प्रकार।
2. हिन्दी पत्रकारिता का संक्षिप्त इतिहास।
3. समाचार–लेखनकला।
4. संपादन के आधारभूत तत्व।
5. व्यावहारिक प्रूफ शोधन।

(जारी.....)

इकाई 05 :

1. पत्रकारिता : शीर्षक की संरचना, लीड, इण्ट्रो एवं शीर्षक संपादन।
2. संपादकीय लेखन
3. पृष्ठसज्जा
4. साक्षात्कार, पत्रकार वार्ता एवं प्रेस–प्रबंधन
5. प्रमुख प्रेस कानून एवं आचार–संहिता।

निबंधात्मक प्रश्न	–	**2x10=20**
लघु उत्तरी प्रश्न	–	**5x6=30**
वस्तुनिष्ठ प्रश्न	–	**10x1=10**

संदर्भ ग्रंथ :

1. हिन्दी पत्रकारिता भारतेन्दु पूर्व से छायावादोत्तर काल तक, लेखक डॉ. धीरेन्द्र नाथ सिंह, प्रकाशक विश्वविद्यालय प्रकाशन वाराणसी।
2. हिन्दी पत्रकारिता का नया स्वरूप, लेखक बच्चन सिंह पत्रकार, प्रकाशक विश्वविद्यालय प्रकाशन, वाराणसी।
3. कम्प्यूटर एक परिचय, लेखक विनय कुमार ओझा, प्रकाशन परीक्षा मंथन।
4. प्रयोजन मूलक हिन्दी, विनोद गोदरे, वाणी प्रकाशन दिल्ली।
5. जन पत्रकारिता, जनसंचार, सूर्यप्रसाद दीक्षित, संजय प्रकाशन, नई दिल्ली।
6. सम्पूर्ण पत्रकारिता, डॉ. अर्जुन तिवारी, विश्वविद्यालय प्रकाशन, वाराणसी।

एम.ए. हिन्दी, द्वितीय समसत्र
प्रश्नपत्र-प्रथम
प्राचीन एवं मध्यकालीन काव्य तथा उसका इतिहास
(CC-201)

पूर्णांक : 60

आंतरिक मूल्यांकन : 40

उद्देश्य : विद्यार्थियों को इस बात से परिचित कराना कि प्राचीन एवं मध्यकालीन काव्य की लोकमंगल की साधना अवस्था काव्य में किस प्रकार संभव होती है। साथ ही उत्तर मध्यकालीन काव्य अपनी कलात्मक अभिव्यंजना में बेजोड़ है। इसका अध्ययन समाज, संस्कृति एवं युग की धड़कनों को समग्रता में समझने के लिए अनिवार्य है।

पाठ्य विषय :

इकाई 01 : **2x10=20**

सूरदास :– भ्रमरगीत सार, संपादक रामचन्द्र शुक्ल, पद क्रमांक 21 से 70 ।
तुलसीदास :– रामचरितमानस, अयोध्या काण्ड, दोहा क्रमांक 51 से 100।
बिहारी :– बिहारी रत्नाकर, संपादक जगन्नाथ रत्नाकर, दोहा क्रमांक 01 से 50।

इकाई–02 : **2x5=10**

सूरदास, तुलसीदास एवं बिहारी से संबंधित निबंधात्मक प्रश्न।

इकाई–03 : **2x5=10**

भक्तिकाल (सगुण भक्तिधारा) एवं रीतिकाल का इतिहास प्रवृत्तियाँ और प्रमुख रचनाकारों से संबंधित निबंधात्मक प्रश्न।

इकाई–04 : **2x5=10**

द्रुतपाठ के कवि, नंददास, मीराबाई, घनानंद और केशव से संबंधित, लघुत्तरीय प्रश्न।

इकाई–05 : **10x1=10**

वस्तुनिष्ठ प्रश्न (सम्पूर्ण पाठ्यक्रम से)

संदर्भ ग्रंथ :–

1. हिन्दी के प्राचीन प्रतिनिधि कवि, लेखक–द्वारका प्रसाद सक्सेना, प्रकाशक श्री विनोद पुस्तक मंदिर, आगरा–2।
2. हिन्दी साहित्य का इतिहास, लेखक रामचन्द्र शुक्ल, प्रकाशक राजकमल प्रकाशन।
3. हिन्दी साहित्य का इतिहास, लेखक डॉ. नगेन्द्र एवं डॉ. हरदयाल, प्रकाशक नेशनल पब्लिशिंग हाउस, नई दिल्ली।
4. सूर और उनक साहित्य, हरवंशलाल शर्मा, भारत प्रकाशन मंदिर अलीगढ़।
5. रीतिकाव्य की भूमिका, डॉ. नागेन्द्र, नेशनल पब्लिशिंग हाउस, दिल्ली।
6. गोस्वामी तुलसीदास, आचार्य रामचन्द्र शुक्ल, इण्डियन प्रेस लि. प्रयागराज।

एम.ए. हिन्दी, द्वितीय समसत्र
प्रश्नपत्र-द्वितीय
आधुनिक हिन्दी गद्य और उसका इतिहास
(CC-202)

पूर्णांक : 60
आंतरिक मूल्यांकन : 40

उद्देश्य - उपन्यास, कहानी तथा निबंध विधाओं के रूप में गद्य साहित्य वामन से विराट बन गया है। आधुनिक काल में गद्य के विविध रूपों का विकास इस तथ्य का साक्षी है। इसका अध्ययन चिन्तन प्रक्रिया के विकास से परिचित होने के लिए आवश्यक है।

पाठ्य विषय :-

इकाई–01 **2x10=20**

(i) उपन्यास– बाणभट्ट की आत्मकथा, हजारी प्रसाद द्विवेदी

(ii) निबंध–

- देश सेवा का महत्व–बालकृष्ण भट्ट
- कछुआ धर्म–चन्द्रधर शर्मा गुलेरी
- कविता क्या है–आचार्य रामचन्द्र शुक्ल
- अशोक के फूल–हजारी प्रसाद द्विवेदी
- मेरे राम का मुकुट भीग रहा है–विद्यानिवास मिश्र
- प्रिया नीलकंठी–कुबेरनाथ राय
- पगडण्डियों का जमाना–हरिशंकर परसाई

(iii) निर्धारित कहानियाँ –

- उसने कहा था–चन्द्रधर शर्मा गुलेरी
- पूस की रात–प्रेमचंद
- आकाशदीप–जयशंकर प्रसाद
- अपना अपना भाग्य–जैनेन्द्र कुमार
- तीसरी कसम–फणीश्वरनाथ रेणु
- लंदन की एक रात–निर्मल वर्मा
- राजा निरबंसिया–कमलेश्वर
- क्षमा करो हे वत्स–देवेन्द्र

(iv) पथ के साथी–महादेवी वर्मा

इकाई–02 : **2x5=10**

बाणभट्ट की आत्मकथा, निर्धारित निबंध, कहानी एवं पथ के साथी से समीक्षात्मक प्रश्न।

(जारी.....)

इकाई 03 : **2x5=10**

हिन्दी, कहानी, निबंध एवं अन्य गद्य विधाओं (रेखाचित्र, संस्मरण, आत्मकथा, जीवनी, यात्रावृत्तांत, व्यंग्य आदि) के इतिहास प्रवृत्तियाँ और प्रमुख रचनाकारों से सम्बद्ध निबंधात्मक प्रश्न।

इकाई 04 : **2x5=10**

लघुउत्तरीय प्रश्न :– द्रुतपाठ में निर्धारित निम्नलिखित गद्यकारों पर केन्द्रित दो लघुउत्तरीय प्रश्न पूछे जायेंगे।

निबंधकार :– भारतेन्दु हरिश्चन्द्र, प्रताप नारायण मिश्र, बालमुकुन्द गुप्त, सरदार पूर्ण सिंह।

कहानीकार :– अज्ञेय, यशपाल, फणीश्वरनाथ रेणु, भीष्म साहनी, अमरकांत।

रफुट ग्रंथ :– 1) अमृतराय (कलम का सिपाही), 2) शिवप्रसाद सिंह (उत्तर योगी), 3) हरिवंशराय बच्चन (क्या भूलूं क्या याद करूं), 4) राहुल सांस्कृत्यायन (घुमक्कड़ शास्त्र), 5) माखनलाल चतुर्वेदी (साहित्य देवता)

इकाई 05 : **10x1=10**

वस्तुनिष्ठ प्रश्न (सम्पूर्ण पाठ्यक्रम से)

संदर्भ ग्रंथ :

1. हिन्दी में निबंध साहित्य, लेखक जनार्दनस्वरूप अग्रवाल, प्रकाशक साहित्य भवन लिमिटेड, प्रयागराज।
2. कहानी : स्वरूप और संवेदना, लेखक राजेन्द्र यादव, प्रकाशक वाणी प्रकाशन।
3. एक दुनिया : समानान्तर, लेखक राजेन्द्र यादव, प्रकाशक राधाकृष्ण प्रकाशन।
4. हिन्दी कहानी की पहचान और परख, संपा. इन्द्रलाल मदान, लिपि प्रकाशन, नई दिल्ली।
5. नयी कहानी की भूमिका, कमलेश्वर, अक्षर प्रकाशन, नई दिल्ली।
6. कहानी, नयी कहानी, नामवर सिंह, लोकभारती प्रकाशन, प्रयागराज।
7. निबंध नवगीत, लक्ष्मीसागर, वार्ष्णेय, वाराणसी वि.वि. प्रकाशन।

एम.ए. हिन्दी, द्वितीय समसत्र
प्रश्न-पत्र-तृतीय
भारतीय एवं पाश्चात्य काव्यशास्त्र
(CC-203)

पूर्णांक : 60
आंतरिक मूल्यांकन : 40

उद्देश्य : पाश्चात्य चिन्तकों के काव्यालोचन को जानने तथा पूर्ववर्ती एवं आधुनिक वैश्विक काव्य के मर्म को समझने के लिए यह प्रश्न–पत्र आवश्यक है।

पाठ्य विषय :–

इकाई 01 :

प्लेटो : काव्य–सिद्धांत
अरस्तू : अनुकरण–सिद्धांत, त्रासदी–विवेचन, विरेचन–सिद्धांत
लोंजाइनस : उदात्त की अवधारणा।

इकाई 02 :

ड्राइडन के काव्य सिद्धांत
वड्र्सवर्थ : काव्य–भाषा का सिद्धांत
कालरिज : कल्पना–सिद्धांत और ललित–कल्पना

इकाई 03 :

मैथ्यू आर्नल्ड : आलोचना का स्वरूप और प्रकार्य

टी.एस. इलियट : परंपरा की परिकल्पना और वैयाक्तिक प्रज्ञा, निवैर्यक्तिकता का सिद्धांत, वस्तुनिष्ठ समीकरण, संवदेनशीलता का असाहचर्य।

आई.ए. रिचर्डस : रागात्मक अर्थ। संवेगों का संतुलन, व्यावहारिक आलोचना।

इकाई 04 :

सिद्धांत और वाद : अभिजात्यवाद, स्वच्छंदतावाद, अभिव्यंजनावाद, मार्क्सवाद, मनोविश्लेषण तथा अस्तित्ववाद।

इकाई 05 :

आधुनिक समीक्षा की विशिष्ट प्रवृत्तियॉ : संरचनावाद, शैलीविज्ञान, विखण्डनवाद, उत्तर आधुनिकतावाद।

आलोचनात्मक प्रश्न– **2x10=20** लघु उत्तरी प्रश्न– **5x6=30** वस्तुनिष्ठ प्रश्न– **10x1=10**

(जारी.....)

संदर्भ ग्रंथ :–

1. भारतीय एवं पाश्चात्य काव्य सिद्धांत, लेखक डॉ. गणपतिचन्द्र गुप्त, प्रकाशक लोकभारती प्रकाशन।
2. काव्यशास्त्र, लेखक डॉ. भगीरथ मिश्र, प्रकाशक विश्वविद्यालय प्रकाशन वाराणसी।
3. भारतीय एवं पाश्चात्य काव्यशास्त्र, लेखक डॉ. विवेक शंकर, प्रकाशक राजस्थान हिन्दी ग्रंथ अकादमी।
4. भारतीय एवं पाश्चात्य काव्यशास्त्र की रूपरेखा, रामचन्द्र तिवारी।
5. साहित्य शास्त्र, लेखक आचार्य बलदेव उपाध्याय, प्रकाशक नंदकिशोर एण्ड सन्स, वाराणसी।
6. भारतीय काव्यशास्त्र एवं पाश्चात्य साहित्य चिंतन, लेखक डॉ. सभापति मिश्र, प्रकाशक जय भारती प्रकाशन, इलाहाबाद।
7. पाश्चात्य काव्यशास्त्र, आ. देवेन्द्रनाथ शर्मा, मयूर बुक्स।
8. साहित्य अध्ययन की दृष्टियाँ, सं. उदयभान सिंह, नेशनल पब्लिशिंग हाउस, नई दिल्ली।

एम.ए. हिन्दी, द्वितीय समसत्र
प्रश्न-पत्र-चतुर्थ
प्रयोजन मूलक हिन्दी
(GE-204)

पूर्णांक : 60

आंतरिक मूल्यांकन : 40

उद्देश्य :– जनसंचार माध्यमों के अनुवाद का स्वरूप, क्षेत्र एवं प्रविधि एवं हिन्दी की प्रयोजनीयता में अनुवाद की उपयोगिता सर्वविदित है। विद्यार्थियों को इसका ज्ञान आवश्यक है।

पाठ्य विषय :–

इकाई 01 : मीडिया लेखन

1. जनसंचार–प्रौद्योगिकी एवं चुनौतियाँ।
2. विभिन्न जनसंचार माध्यमों का स्वरूप–मुद्रण, श्रव्य, दृश्य–श्रृव्य, इंटरनेट।
3. श्रृव्य माध्यम–रोडियो, मैखिक भाषा की प्रकृति, समाचार लेखन एवं वाचन, रोडियो नाटक, उद्घोषणा लेखन, विज्ञापन लेखन, फीचर तथा रिपोर्ताज।

इकाई–02 :

1. दृश्य–श्रृव्य माध्यम (फिल्म, टेलीविजन, विडियो), दृश्य माध्यमों में भाषा की प्रकृति, दृश्य एवं श्रव्य सामग्री का सामंजस्य, पार्श्व वाचन (वायस ओवर) पटकथा लेखन, टेलीड्रामा, डॉक्यू ड्रामा, संवाद–लेखन, साहित्य की विधाओं का दृश्य माध्यमों का रूपांतरण, विज्ञापन की भाषा।
2. इंटरनेट सामग्री सृजन – (Content creation)

इकाई 03 : हिन्दी : कम्प्यूटर अनुप्रयोग

1. अनुवाद का स्वरूप, क्षेत्र, प्रक्रिया एवं प्रविधि।
2. हिन्दी की प्रयोजनीयता में अनुवाद की भूमिका।
3. कार्यालयीन हिन्दी और अनुवाद।
4. जनसंचार माध्यमों का अनुवाद।
5. विज्ञापन में अनुवाद।
6. वैचारिक साहित्य का अनुवाद।

(जारी.....)

इकाई 04 :

1. वाणिज्यिक अनुवाद।
2. वैज्ञानिक, तकनीकी तथा प्रौद्योगिकी क्षेत्र में अनुवाद।
3. विधि–साहित्य की हिन्दी और अनुवाद।
4. व्यावहारिका अनुवाद अभ्यास।
5. कार्यालयीन अनुवाद :– कार्यालयीन एवं प्रशासनिक शब्दावली, प्रशासनिक, प्रयुन्तियाँ, पदनाम, विभाग आदि।
6. पत्रों के अनुवाद।
7. पदनामों, अनुभागों, दस्तावेजों, प्रतिवेदनों के अनुवाद।

इकाई–05 :

1. बैंक साहित्य के अनुवाद का अभ्यास।
2. विधि साहित्य के अनुवाद का अभ्यास।
3. साहित्यिक अनुवाद के सिद्धांत एवं व्यवहार : कविता, कहानी, नाटक।
4. सरानुवाद।
5. दुभाषिया प्रविधि।
6. अनुवाद पुनरीक्षण एवं मूल्यांकन।

निबंधात्मक प्रश्न	–	**2x10=20**
लघु उत्तरी प्रश्न	–	**5x6=30**
वस्तुनिष्ठ प्रश्न	–	**10x1=10**

संदर्भ ग्रंथ :–

1. आधुनिक मीडिया लेखन एवं हिन्दी रचना, लेखक डॉ. अशोक बत्रा, प्रकाशक लक्ष्मी प्रकाशन।
2. मीडिया संचार माध्यम एवं लेखन कला, लेखक रामप्रसाद मौर्य, प्रकाशक अर्जुन पब्लिशिंग हाउस।
3. प्रयोजन मूलक हिन्दी की नयी भूमिका, लेखक कैलाशनाथ पाण्डेय, प्रकाशक राजकमल प्रकाशन प्राइवेट लिमि.।
4. अनुवाद सिद्धांत और प्रयोग, लेखक भोलानाथ तिवारी।
5. हिन्दी भाषा एवं साहित्य का इतिहास, हिन्दी पत्रकारिता एवं निबंध लेखन प्रो. राजेन्द्र प्रसाद श्रीवास्तव, प्रकाशक भवदीय प्रकाशन, अयोध्या फैजाबाद।

एम.ए. हिन्दी, तृतीय समसत्र
प्रश्न-पत्र-प्रथम
आधुनिक हिन्दी काव्य और उसका इतिहास
(CC-301)

पूर्णांक : 60

आंतरिक मूल्यांकन : 40

उद्देश्य : उन्नीसवीं शती के उत्तरार्द्ध से अध्यावधि तक की संवेदनाएँ, भावनाएँ एवं नूतन विचार सारणियाँ इसमें अभिव्यक्त हुई हैं। अतः संवेदना तथा ज्ञानक्षितिज के विस्तार के लिए इसका अध्ययन अत्यंत आवश्यक एवं प्रासंगिक है।

पाठ्य विषय :–

इकाई–01 : व्याख्याश – **2x10=20**

1. मैथिलीशरण गुप्त : साकेत (नवम् सर्ग)
2. जयशंकर प्रसाद : कामायनी (चिंता, श्रद्धा एवं इडा सर्ग)
3. सूर्यकांत त्रिपाठी निराला : निर्धारित संकलन–राग विराग (संपादक रामविलास शर्मा) में संकलित कविताएँ। राम की शक्ति पूजा, सरोज स्मृति एवं कुकुरमुत्ता।

इकाई–02 : **2x5=10**

मैथिलीशरण गुप्त, जयशंकर प्रसाद एवं निराला से संबंधित समीक्षात्मक प्रश्न (एक)

इकाई–03 : **2x5=10**

आधुनिक हिन्दी काव्य (छायावाद तक) की प्रमुख प्रवृत्तियाँ, इतिहास और प्रमुख कवि

इकाई–04 : **2x5=10**

लघुउत्तरीय प्रश्न :– (दो)

द्रुतपाठ से निर्धारित कवि जगन्नाथदास रत्नाकर अयोध्या सिंह उपाध्याय हरिऔध, महादेवी वर्मा और बालकृष्ण शर्मा 'नवीन' से संबंध दो लघुउत्तरीय प्रश्न।

इकाई–05 : **10x1=10**

वस्तुनिष्ठ प्रश्न (सम्पूर्ण पाठ्यक्रम से)

संदर्भ ग्रंथ :–

1. हिन्दी साहित्य का इतिहास, लेखक डॉ. रामचन्द्र शुक्ल, प्रकाशक राजकमल प्रकाशन।
2. आधुनिक हिन्दी काव्य और कवि, लेखक डॉ. रामचन्द्र तिवारी, प्रकाशक नया साहित्य प्रकाशन इलाहाबाद।
3. कामायनी की टीका, लेखक श्री विश्वम्भर 'मानव', प्रकाशक लोकभारती प्रकाशन, इलाहाबाद।
4. निराला और अपरा, लेखन डॉ. राजेश्वर प्रसाद चतुर्वेदी, प्रकाशक विनोद पुस्तक मंदिर, आगरा।
5. साकेत की टीका, लेखक ओम प्रकाश सिंहल, प्रकाशन हिन्दी साहित्य संसार, दिल्ली।

एम.ए. हिन्दी, तृतीय समसत्र
प्रश्न-पत्र-द्वितीय
भाषा विज्ञान एवं हिन्दी भाषा
(CC-302)

पूर्णांक : 60

आंतरिक मूल्यांकन : 40

उद्देश्य : साहित्य आद्यंत एक भाषिक निर्मित है। साहित्य के गम्भीर अध्ययन के लिए भाषिक व्यवस्था का सुस्पष्ट सर्वांगीण ज्ञान अपरिहार्य है।

पाठ्य विषय :–

इकाई–01 :

भाषा और भाषा विज्ञान–भाषा की परिभाषा और अभिलक्षण, भाषा–व्यवस्था और भाषा–व्यवहार, भाषा संरचना और भाषिक–प्रकार्य। भाषा विज्ञान स्वरूप एवं व्याप्ति, अध्ययन की दिशाएँ–वर्णनात्मक, ऐतिहासिक और तुलनात्मक।

इकाई–02

स्वप्न प्रक्रिया–स्वप्न विज्ञान का स्वरूप और शाखाएँ, वांगयंत्र और उनके कार्य स्वन की अवधारणा और स्वनों का वर्गीकरण, स्वन–गुण, स्वनिक–परिवर्तन। स्वनिम विज्ञान का स्वरूप, स्वनिम की अवधारणा, स्वनिम में भेद, स्वनिमिक–विश्लेषण।

इकाई–03 :

व्याकरण–रूपविज्ञान का स्वयप और शाखाएँ, रूपिम की अवधारणा और भेद मुक्त–आबद्ध, अर्थदर्शी और संबंधदर्शी, संबंधदर्शी भेद और प्रकार। वाक्य की अवधारणा, अभिहितान्वयवाद और अन्विताभिधानवाद, वाक्य के भेद, वाक्य–विश्लेषण, निकटस्थ अवयव विश्लेषण, गहन–संरचना और बाह्य संरचना।

इकाई–04

अर्थविज्ञान–अर्थ की अवधारणा, शब्द और अर्थ संबंध, पर्यायता, अनेकार्थता, विलोमता, अर्थ प्राप्ति के साधन, अर्थ परिवर्तन।

इकाई–05

साहित्य और भाषाविज्ञान–साहित्य में अध्ययन में भाषाविज्ञान के अंगों की अपयोगिता।

आलोचनात्मक प्रश्न	–	**2x10=20**
लघु उत्तरी प्रश्न	–	**5x6=30**
वस्तुनिष्ठ प्रश्न	–	**10x1=10**

संदर्भ ग्रंथ :–

1. भाषा–विज्ञान, लेखक डॉ. भोलानाथ तिवारी, प्रकाशक किताब महल प्राइवेट लिमिटेड, इलाहाबाद।
2. आधुनिक भाषा विज्ञान, लेखक डॉ. विवेक शंकर, प्रकाशक राजस्थान हिन्दी ग्रंथ अकादमी।
3. भाषा विज्ञान की भूमिका, लेखक आचार्य देवेन्द्रनाथ शर्मा, प्रकाशक राधाकृष्ण प्रकाशन, नई दिल्ली।
4. भाषा विज्ञान सिद्धांत और स्वरूप, डॉ. जितराम पाठक, अनुपम प्रकाशन पटना।

एम.ए. हिन्दी, तृतीय समसत्र
प्रश्न-पत्र तृतीय
हिन्दी साहित्य के इतिहास
(CC-303)

पूर्णांक : 60
आंतरिक मूल्यांकन : 40

उद्देश्य : साहित्य के इतिहास का परिचय, हिन्दी साहित्य के इतिहास लेखन की परम्परा और पुनर्लेखन के ज्ञान हेतु यह प्रश्न–पत्र अनिवार्य है।

पाठ्य विषय :–

इकाई–01 :

हिन्दी साहित्य के इतिहास लेखन की परम्परा और साहित्येतिहास के पुनर्लेखन की समस्याएँ।

इकाई–02

हिन्दी साहित्य के आदिकाल की पृष्ठभूमि, साहित्यक प्रवृत्तियाँ, काव्याधाराएँ, गद्य साहित्य, प्रतिनिधि रचनाकार और इनकी रचनाएँ।

इकाई–03 :

पूर्वमध्यकाल भक्तिकाल की ऐतिहासिक पृष्ठभूमि, सांस्कृतिक चेतना एवं भक्ति आंदोलन, विभिन्न काव्य धाराएँ तथा उनका विश्लेषण, प्रमुख निर्गुण संत कवि और प्रमुख सूफी कवियों का अवदान।

इकाई–04

राम काव्य और कृष्णकाव्य : प्रमुख कवि और उनका रचनागत वैशिष्ट्य।

इकाई–05

उत्तर मध्यकाल (रीतिकाल) की ऐतिहासिक पृष्ठभूमि, काल सीमा और नामकरण, विविध धाराएँ रीतिबद्ध, रीतिसिद्ध, रीतिमुक्त, प्रवृत्तियाँ और विशेषताएँ।

दीर्घ उत्तरीय	–	**2x10=20**
लघु उत्तरी प्रश्न	–	**5x6=30**
वस्तुनिष्ठ प्रश्न	–	**10x1=10**

संदर्भ ग्रंथ :–

1. इतिहास और आलोचना–नामवर सिंह, राजकमल प्रकाशन, नई दिल्ली।
2. हिन्दी साहित्य का दूसरा इतिहास, डॉ. बच्चन सिंह, वाणी प्रकाशन, नई दिल्ली।
3. साहित्य और इतिहास दृष्टि, डॉ. मैनेजर पाण्डेय, वाणी प्रकाशन, नई दिल्ली।
4. हिन्दी साहित्य का इतिहास, डॉ. नगेन्द्र, वाणी प्रकाशन, नई दिल्ली।
5. साहित्य इतिहास और संस्कृति, शिवकुमार मिश्र, वाणी प्रकाशन।

एम.ए. हिन्दी, तृतीय समसत्र
प्रश्नपत्र-चतुर्थ
गोस्वामी तुलसीदास
(GE-304)

पूर्णांक : 60

आंतरिक मूल्यांकन : 40

उद्देश्य : तुलसीदास का रामचरितमानस भारतीय जनमानस की कथा कहती है मर्यादा पुरुषोत्तम राम के चरित्र परिचय कराने के लिए यह प्रश्न–पत्र है।

पाठ्य विषय :–

व्याख्या हेतु निर्धारित – रामचरित मानस (बालकाण्ड, अयोध्याकाण्ड और उत्तरकाण्ड)

आलोचनात्मक प्रश्न – तुलसीदास की युगीन पृष्ठभूमि, जीवन, कृतित्व एवं रामचरित मानस से संबंधित होंगे।

व्याख्याएँ	–	**2x10=20**
आलोचनात्मक प्रश्न	–	**2x5=10**
लघु उत्तरी प्रश्न	–	**4x5=20**
वस्तुनिष्ठ प्रश्न	–	**10x1=10**

संदर्भ ग्रंथ :–

1. रामचरितमानस, प्रकाशक गीता प्रेस, गोरखपुर।
2. गोस्वामी तुलसीदास, रामचंद्र शुक्ल, इण्डियन प्रेस प्रयागराज।
3. तुलसीदास, उदयभान सिंह, राधाकृष्ण प्रकाशन नई दिल्ली।
4. लोकवादी तुलसीदास, डॉ. विश्वनाथ त्रिपाठी, राधाकृष्ण प्रकाश नई दिल्ली।

एम.ए. हिन्दी, तृतीय समसत्र
प्रश्नपत्र-चतुर्थ
सूरदास
(GE-304)

पूर्णांक : 60

आंतरिक मूल्यांकन : 40

उद्देश्य : भारत एक कृषि प्रधान देश है। सूरदास कृषक संस्कृति एवं पशुपालन संस्कृति के कवियों में वरेण्य हैं। वे प्रेम और वात्सल्य के अद्‌भुत चितेरे हैं। विद्यार्थियों को इस संवेदनों से परिचित कराने के लिए यह वैकल्पिक प्रश्न–पत्र निर्धारित है।

ग्रंथ 'सूरसागर सार' संपादक – डॉ. धीरेन्द्र वर्मा

निर्धारित पद (प्रारम्भ से मथुरागमन के पूर्व तक) आलोचनात्मक प्रश्न सूर साहित्य की पृष्ठभूमि, जीवन, रचनाएँ तथा निर्धारित अंश से सम्बद्ध पूछे जाएँगे।

व्याख्याएँ	–	**2x10=20**
आलोचनात्मक प्रश्न	–	**2x5=10**
लघु उत्तरी प्रश्न	–	**4x5=20**
वस्तुनिष्ठ प्रश्न	–	**10x1=10**

संदर्भ ग्रंथ :–

1. सूरदास, लेखक आचार्य रामचन्द्र शुक्ल, प्रकाशक नागरी प्राचारिणी सभा, वाराणसी।
2. भक्ति आंदोलन और सूरदास का काव्य, मैनेजर पाण्डेय, वाणी प्रकाशन नई दिल्ली।
3. सूरदास : मूल्यांकन पुनर्मूल्याकन, लेखक परमानन्द श्रीवास्तव, प्रकाशक अभिव्यक्ति प्रकाशन, इलाहाबाद।
4. सूर साहित्य, हजारी प्रसाद द्विवेदी, राजकमल प्रकाशन नई दिल्ली।

एम.ए. हिन्दी

समसत्र तृतीय

वैकल्पिक प्रश्न पत्र (बघेली भाषा और उसका इतिहास)

प्रश्न-पत्र चतुर्थ (GE-304)

पूर्णांक . 60
आन्तरिक मूल्यांकन . 10

उद्देश्य · आज वैश्वीकरण का जमाना है। 'वसुधा' कुटुम्ब हो रही है परन्तु बिना जमीन पर खड़े हुए आकाश को नहीं निहारा जा सकता। बिना 'लोकल' के हम 'ग्लोबल' की कल्पना नहीं कर सकते। विद्यार्थियों को उनकी जमीन, बोली–बानी भाषा के मर्म से परिचित कराने के लिए जनपदीय भाषा और साहित्य के अध्ययन हेतु 'बघेली भाषा एवं साहित्य के अन्तर्गत मानवता की मातृभाषा कविता का यह प्रश्न–पत्र रखा गया है।

इकाई-01 :-

बघेली तथा हिन्दी की अन्य बोलियाँ, बघेली का उद्भव और विकास, बघेली का व्याकरण।

इकाई-02 :- बघेली कविता

बैजनाथ पाण्डेय 'बैजू', सैफूद्दीन सिद्दिकी 'सैफू', शम्भूनाथ द्विवेदी 'शम्भू काकू', गोमती प्रसाद 'विकल', अमोल वटरोही, अनूप अशेष।

पाठ्यपुस्तक–बघेली भाषा एवं साहित्य–संपादक डॉ. प्रतिभा चतुर्वेदी, मध्यप्रदेश हिन्दी ग्रंथ अकादमी, भोपाल।

इकाई-03 :-

उपर्युक्त कवियों से संबंधित समीक्षात्मक प्रश्न।

इकाई-04 :-

बघेली लोक साहित्य के विशेषताएँ।

इकाई-05 :-

द्रुतपाठ के कवि (कालिका प्रसाद त्रिपाठी, डॉ. रामसिया शर्मा, शिवशंकर मिश्र 'सरस', डॉ. कैलाश तिवारी, बाबूलाल दाहिया, सुधाकांत मिश्रा 'बेलाला', रामनरेश तिवारी 'निष्ठुर', सुदामा शरद, सुधाकांत मिश्रा 'बेलाला',)।

पाठ्यपुस्तक–बघेली भाषा और साहित्य संपादक डॉ. सत्येन्द्र शर्मा, प्रकाशकः मध्यप्रदेश हिन्दी ग्रंथ अकादमी, भोपाल।

(जारी.....)

व्याख्यात्मक प्रश्न	–	**2x10=20**
दीर्घ उत्तरी प्रश्न	–	**2x10=20**
लघु उत्तरी प्रश्न	–	**2x5=10**
वस्तुनिष्ठ प्रश्न (सम्पूर्ण पाठ्यक्रम से)	–	**10x1=10**

संदर्भ ग्रंथ :

1. नेउतहरी–सैफूद्दीप सिद्दिकी 'सैफू'।
2. चिरई चुनगुन–डॉ. भागवत प्रसाद शर्मा, कुमार प्रकाशन रीवा।
3. सेंदूर केर बोझ–श्रीमती रश्मि शुक्ला, गणेश प्रकाशन मंदिर प्रयागराज।
4. थोर का सुख–डॉ. चंद्रिका प्रसाद 'चंद्र', रूपांकन प्रकाशन इन्दौर।
5. फूलमती–योगेश त्रिपाठी, उत्कर्ष प्रकाशन 142 शाक्यपुरी, कंकर खेड़ा मेरठ उत्तरप्रदेश।
6. लोकगीतों का तुलनात्मक अध्ययन–(बुन्देलखण्ड एवं बघेलखण्ड के संदर्भ में), डॉ. विनोद त्रिपाठी, साहित्य वाणी प्रयागराज।

एम.ए. हिन्दी, चतुर्थ समसत्र
प्रश्नपत्र-प्रथम
आधुनिक हिन्दी काव्य और उसका इतिहास
(CC-401)

पूर्णांक : 60
आंतरिक मूल्यांकन : 40

उद्देश्य : आधुनिक हिन्दी काव्य और उसके इतिहास से विद्यार्थियों को परिचित कराना। स्वतंत्रता आंदोलन और तत्पश्चात् स्वतंत्र्योत्तर भारत की गति दशा और दिशा के काव्य से परिचित कराना।

पाठ्य विषय :–

इकाई–01 : व्याख्या – 2x10=20

1. सुमित्रानंदन पंत–निर्धारित संकलन, रश्मिबंध में संकलित परिवर्तन, नौकाविहार, एक तारा, मौन निमंत्रण आ धरती कितना देती है।
2. सच्चिदानंद हीरानंद वात्स्यायन 'अज्ञेय', नदी के द्वीप, असाध्य वीणा, कलगी बाजरें की, परती का गीत।
3. गजानन माधव मुक्तिबोध, ब्रह्म राक्षस कम, मुझे कदम–कदम पर, लकड़ी का बना रावण।

इकाई–02 : 2x5=10

पंत, अज्ञेय और मुक्तिबोध से संबंध समीक्षात्मक प्रश्न

इकाई–03 : 2x5=10

छायावादोत्तर काव्य की प्रमुख प्रवृत्तियाँ, इतिहास और प्रमुख कवियों पर निबंधात्मक प्रश्न।

इकाई–04 : 2x5=10

लघुउत्तरीय प्रश्न :– (दो)

दुतपाठ से निर्धारित कवि हरिवंशराय बच्चन, भवानी प्रसाद मिश्र, श्री नरेश महेता, रघुवीर से संबंध दो लघुउत्तरीय प्रश्न।

इकाई–05 : 10x1=10

वस्तुनिष्ठ प्रश्न (सम्पूर्ण पाठ्यक्रम से)

संदर्भ ग्रंथ :–

1. हिन्दी साहित्य का इतिहास, लेखक डॉ. रामचन्द्र शुक्ल, प्रकाशक राजकमल प्रकाशन।
2. आधुनिक हिन्दी काव्य और कवि, लेखक डॉ. रामचन्द्र तिवारी, प्रकाशक नया साहित्य प्रकाशन इलाहाबाद।
3. छायावाद, डॉ. नामवर सिंह, प्रकाशक राजकमल प्रकाशन, नई दिल्ली।
4. आधुनिक कवि, विश्वम्भर 'मानव', रामकिशोर शर्मा, प्रकाशक लोकभारती प्रकाशन, इलाहाबाद।
5. सुमित्रानंदन पंत, डॉ. नगेन्द्र, नेशनल पब्लिशिंग हाउस, नई दिल्ली।

एम.ए. हिन्दी, चतुर्थ समसत्र
प्रश्न-पत्र-द्वितीय
भाषा विज्ञान एवं हिन्दी भाषा
(CC-402)

पूर्णांक : 60
आंतरिक मूल्यांकन : 40

उद्देश्य : भाषा विज्ञान भाषा की वस्तुनिष्ठ अध्ययन प्रणाली के रूप में भाषिक ईकाईयों तथा भाषा संरचना के विभिन्न स्तरों पर उनके अन्तर्संबंधों के विन्यास को आलोकित कर न केवल अध्येता को भाषिक अर्द्धदृष्टि देता है। अपितु भाषा विषयक विवेचन के लिए एक निरूपक भाषा भी प्रदान करता है।

पाठ्य विषय :–

इकाई–01 :

हिन्दी की ऐतिहासिक पृष्ठभूमि : प्राचीन भारतीय आर्य भाषाएँ–वैदिक तथा लौकिक संस्कृत और उनकी विशेषताएँ। मध्यकालीन भारतीय आर्य भाषाएँ–पालि, प्राकृत–शैरसेनी, अर्द्धमागधी, मागधी, अपभ्रंश और उनकी विशेषताएँ। आधुनिक भारतीय आर्यभाषाएँ और उनका वर्गीकरण।

इकाई–02 :

हिन्दी का भौगोलिक विस्तार : हिन्दी की उपभाषाएँ, पश्चिमी हिन्दी, पूर्वी हिन्दी, राजस्थानी, बिहारी तथा पहाड़ी और उनकी बोलियाँ। खड़ी बोली, ब्रज और अवधी की विशेषताएँ।

इकाई–03 :

हिन्दी का भाषिक स्वरूप : हिन्दी की स्वनिम व्यवस्था–खंड्य, खंड्येतर। हिन्दी शब्द रचना, उपसर्ग, प्रत्यय, समास। रूप रचना–लिंग, वचन और कारक–व्यवस्था के संदर्भ में हिन्दी के संज्ञा, सर्वनाम विशेषण और क्रिया रूप। हिन्दी वाक्य–रचना : पदक्रम और अन्विति।

इकाई–04 :

हिन्दी के विविध रूप : संपर्क भाषा, राष्ट्रभाषा, राजभाषा के रूप में हिन्दी, माध्यम–भाषा, संचार–भाषा, हिन्दी की साविधानिक स्थिति।

इकाई–05 :

हिन्दी में कम्प्यूटर सुविधाएँ : आँकड़ा–संसाधन और शब्द संसाधन, वर्तनी–शोधक, मशीनी अनुवाद, हिन्दी भाषा–शिक्षण।
देवनागरी लिपि : विशेषताएँ और मानकीकरण –

आलोचनात्मक प्रश्न	–	**2x10=20**
लघु उत्तरी प्रश्न	–	**5x6=30**
वस्तुनिष्ठ प्रश्न	–	**10x1=10**

संदर्भ ग्रंथ :–

1. भाषा–विज्ञान, लेखक डॉ. भोलानाथ तिवारी, प्रकाशक किताब महल प्राइवेट लिमिटेड, इलाहाबाद।
2. आधुनिक भाषा विज्ञान, लेखक डॉ. विवेक शंकर, प्रकाशक राजस्थान हिन्दी ग्रंथ अकादमी।
3. भाषा विज्ञान की भूमिका, लेखक आचार्य देवेन्द्रनाथ शर्मा, प्रकाशक राधाकृष्ण प्रकाशन, नई दिल्ली।
4. भाषा विज्ञान सैद्धांतिक चिन्तन, रवीन्द्रनाथ श्रीवास्तव, राधाकृष्ण प्रकाशन दिल्ली।

एम.ए. हिन्दी, चतुर्थ समसत्र
प्रश्न-पत्र तृतीय
हिन्दी साहित्य का इतिहास
(CC-403)

पूर्णांक : 60

आंतरिक मूल्यांकन : 40

उद्देश्य : हिन्दी एम.ए. के विद्यार्थियों के लिए काव्य एवं कथा और उपन्यास सर्जना के इतिहास से परिचित होने के अनिवार्य है।

पाठ्य विषय :–

इकाई–01 :

आधुनिक काल :– आधुनिक काल की सामाजिक, राजनीतिक, आर्थिक एवं सांस्कृतिक पृष्ठभूमि, सन् 1857 ई. का प्रथम स्वाधीनता संग्राम और पुनर्जागरण।

भारतेन्दु युग :– प्रमुख साहित्यकार, रचनाएँ और साहित्यिक विशेषताएँ।

इकाई–02 :

द्विवेदी युग :– प्रमुख साहित्यकार रचनाएँ और साहित्यिक विशेषताएँ। हिन्दी स्वच्छंदतावादी चेतना का अग्रिम विकास, छायावादी काव्य, प्रमुख साहित्यकार, रचनाएँ और साहित्यिक विशेषताएँ।

इकाई–03 :

उत्तर छायावाद की विविध प्रवृत्तियाँ : प्रगतिवाद, प्रयोगवाद, नयी कविता। प्रमुख साहित्यकार, रचनाएँ और साहित्यिक विशेषताएँ।

इकाई–04 :

हिन्दी गद्य की प्रमुख विधाएँ : कहानी, उपन्यास, नाटक निबंध आदि।

इकाई–05 :

संस्मरण रेखाचित्र, जीवनी, आत्मकथा का विकास। हिन्दी आलोचना का उद्‌भव एवं विकास। स्त्री विमर्श और दलित विमर्श का परिचय।

दीर्घ उत्तरी प्रश्न	–	**2x10=20**
लघु उत्तरी प्रश्न	–	**5x6=30**
वस्तुनिष्ठ प्रश्न	–	**10x1=10**

संदर्भ ग्रंथ :–

1. हिन्दी साहित्य का इतिहास, रामचन्द्र शुक्ल
2. हिन्दी साहित्य का आलोचनात्मक इतिहास, डॉ. राम कुमार वर्मा
3. छायावाद, डॉ. नामवर सिंह
4. हिन्दी साहित्य बीसवीं शताब्दी, नंददुलारे वाजपेयी

एम.ए. हिन्दी, चतुर्थ समसत्र
प्रश्न-पत्र चतुर्थ
गोस्वामी तुलसीदास

(GE-404)

पूर्णांक : 60

आंतरिक मूल्यांकन : 40

उद्देश्य : 'कवितावली' सिर्फ राम की कथा नहीं तत्कालीन समाज की धड़कन है। विनय पत्रिका भक्ति, आस्था अज्ञेर समर्पण का काव्य है। विद्यार्थियों के लिए यह परिचय यह आवश्यक है।

पाठ्य विषय :–

व्याख्या हेतु निर्धारित – कवितावली एवं विनय पत्रिका।

आलोचनात्मक प्रश्न – तुलसी की भक्ति, दर्शन तथा निर्धारित कृतियों से संबंधित होंगे।

व्याख्याएँ	–	**2x10=20**
आलोचनात्मक प्रश्न	–	**2x5=10**
लघु उत्तरी प्रश्न	–	**4x5=20**
वस्तुनिष्ठ प्रश्न	–	**10x1=10**

संदर्भ ग्रंथ :–

1. रामचरितमानस, प्रकाशन गीता प्रेस, गोरखपुर।
2. तुलसीदास और उनकी कविता, रामनरेश त्रिपाठी, हिन्दी मंदिर प्रयागराज।
3. तुलसीदास, डॉ. राममूर्ति त्रिपाठी।
4. तुलसी के हिय हेरि, विष्णुकांत शास्त्री।

एम.ए. हिन्दी, चतुर्थ समसत्र
प्रश्न-पत्र चतुर्थ
सूरदास
(GE-404)

पूर्णांक : 60

आंतरिक मूल्यांकन : 40

उद्देश्य : सूरदास हिन्दी साहित्य के सूर्य है। हिन्दी के विद्यार्थियों के ज्ञान और संवेदना के विकास के लिए यह प्रश्न–पत्र आवश्यक है।

ग्रंथ 'सूरसागर सार' सम्पादक – डॉ. धीरेन्द्र वर्मा

निर्धारित पद (मथुरागमन से अंत तक) आलोचनात्मक प्रश्न सूर साहित्य की भक्ति, दर्शन, भ्रमरगीत आदि तथा सूरसागर के निर्धारित अंश से सम्बद्ध पूछे जाएँगे।

व्याख्याएँ	–	**2x10=20**
आलोचनात्मक प्रश्न	–	**2x5=10**
लघु उत्तरी प्रश्न	–	**4x5=20**
वस्तुनिष्ठ प्रश्न	–	**10x1=10**

संदर्भ ग्रंथ :–

1. सूरदास, लेखक आचार्य रामचन्द्र शुक्ल, प्रकाशन नागरी प्राचारिणी सभा, वाराणसी।
2. भ्रमरगीत सार की टीका, लेखक डॉ. राजेश्वर प्रसाद चतुर्वेदी।
3. सूरदास, ब्रजेश्वर वर्मा, हिन्दी परिषद विश्वविद्यालय प्रयागराज।
4. सूरदास : मूल्यांकन पुनर्मूल्याकन, लेखक परमानन्द श्रीवास्तव, प्रकाशन अभिव्यक्ति प्रकाशन, इलाहाबाद।

एम.ए. हिन्दी

समसत्र चतुर्थ

वैकल्पिक प्रश्न पत्र (बघेली भाषा और उसका इतिहास)

प्रश्न-पत्र चतुर्थ (GE-404)

पूर्णांक . 60

आन्तरिक मूल्यांकन . 10

उद्देश्य : गद्य को कवियों की कसौटी कहा गया है। स्थानीय भाषा एवं साहित्य के अन्तर्गत विद्यार्थियों को जनपदीय भाषा के गद्य से परिचित कराने के लिए बघेली नाटक और कहानी का यह प्रश्न–पत्र लिखा गया है।

इकाई-01 :- बघेली कहानी

1. सैफूद्दीन सिद्दिकी 'सैफू' – नेउतहरी
2. डॉ. भागवत प्रसाद शर्मा – चिरई चुनगुन
3. श्रीमती रश्मि शुक्ला – सेंदुर केर बोझ
4. डॉ. चंद्रिका प्रसाद 'चंद्र' – थोर का सुख
5. डॉ. रामसिया शर्मा – उपरेहित

इकाई-02 :- बघेली नाटक

योगेश त्रिपाठी – 'फूलमती'

इकाई-03 :-

उपर्युक्त लेखकों से संबंधित अलोचनात्मक प्रश्न।

इकाई-04 :-

बघेली लोकगीत, लोक कथाएँ, लोकनाट्य से संबंधित लघु उत्तरीय प्रश्न।

इकाई-05 :-

द्रुतपाठ के लेखक (डॉ. चंद्रिका प्रसाद 'चंद्र', डॉ. रामसिया शर्मा, श्रीमती रश्मि शुक्ला, डॉ. भागवत प्रसाद शर्मा, सैफूद्दीन सिद्दिकी 'सैफू') संबंधित लघुउत्तरी प्रश्न।

व्याख्यात्मक प्रश्न	–	**2x10=20**
आलोचनात्मक प्रश्न	–	**2x10=20**
लघु उत्तरी प्रश्न	–	**2x5=10**
वस्तुनिष्ठ प्रश्न (सम्पूर्ण पाठ्यक्रम से)	–	**10x1=10**

(जारी.....)

संदर्भ ग्रंथ :

1. बघेली भाषा और साहित्य–डॉ. भगवती प्रसाद शुक्ल, प्रकाशक साहित्य भवन प्रयागराज।
2. बघेली साहित्य का इतिहास–डॉ. आर्या प्रसाद त्रिपाठी, साहित्य अकादमी मध्यप्रदेश।
3. बघेली संस्कृति और साहित्य–गोमती प्रसाद 'विकल', प्रकाशक राजभाषा एवं संस्कृत संचालनालय, मध्यप्रदेश।
4. बघेली भाषा एवं साहित्य–डॉ. प्रतिभा चतुर्वेदी, मध्यप्रदेश हिन्दी ग्रंथ अकादमी, भोपाल।
5. सोन एवं रेवा के स्वर–संपा. डॉ. कमला प्रसाद, सेवाराम त्रिपाठी, बाबूलाल दाहिया, शिवशंकर मिश्र 'सरस', राजभाषा संचालनालय, भोपाल।
6. बघेलखण्ड के लोकगीत–लखन प्रताप सिंह उरगेस, मध्यप्रदेश आदिवासी लोक कला परिषद भोपाल।
7. हम तोंहार विरवा–कैलाश तिवारी, कुमार प्रकाशन रीवा।
8. बघेली व्याकरण–डॉ. सूर्यभान सिंह, प्रकाशन हिन्दी ग्रंथ अकादमी भोपाल।
9. रनजीत राय–गोमती प्रसाद 'विकल', वर्क प्रिन्टिंग प्रेस, रीवा।

BA (Hon's) A.I.H.C. & Archaeology
PROGRAMME STRUCTURE
(As per NEP 2020 & CBCS Ordinance 14 A)

1st Year

SEMESTER – I					
Course Code & Title	**Course Type**	**Theory Paper**	**Internal Assessment**	**Maximum Marks**	**Credits**
101- Introduction of Ancient Indian History, Culture & Archaeology	Major	60	40	100	6
102 - Indian Philosophy-I	Minor	60	40	100	6
103 - Ancient Indian Human Value	GE	60	40	100	4
104 - English	AE	60	40	100	4
SEMESTER TOTAL				**400**	**20**
CUMULATIVE TOTAL				**400**	**20**

SEMESTER – II					
Course Code & Title	**Course Type**	**Theory Paper**	**Internal Assessment**	**Maximum Marks**	**Credits**
201 - Methods of Archaeology	Major	60	40	100	6
202 - Indian Philosophy-II	Minor	60	40	100	6
203 - Heritage Management in India	GE	60	40	100	4
204 - Environment	AE	60	40	100	4
SEMESTER TOTAL				**400**	**20**
CUMULATIVE TOTAL				**400**	**20**

GE: Generic Elective **AE: Ability Enhancement**

*Students may choose this course as a **Generic Elective** or may choose a Generic Elective Course offered in other UTDs at the same level or may choose a Course offered by MOOCs through SWAYAM.

The student will be awarded Certificate in Bachelor of Arts (CBA) on successful completion of first year.

Credit Distribution to match/surpass the requirements of Annual System in MP Higher Education as per NEP 2020 and also the CBCS Ordinance 14 A passed by Co-ordination Committee:

.

		Main Faculty (as per prerequisite)			Any Faculty	Skill Enhancement Course (SEC)	Ability Enhancement Course (AEC)	Field Projects/ internship/ apprenticeship /community engagement & service	Credits	Qualification Title (Credits Requirements)
		Subject I		Subject II	Subject III					
Level	Sem	Major		Minor	Generic Elective Course	Vocational Course		#Inter/Intra Faculty		
		Core	DSE							
Level 5	1	6		6	4	-	4	-	6+6+4+4 =20	(40) Undergraduate Certificate in Main Faculty
	2	6		6	4	-	4	-	6+6+4+4 =20	
Level 6	3	6		6	4	4	-	-	6+6+4+4 =20	(80) Undergraduate Diploma in Main Faculty
	4	6		6	4	4	-	-	6+6+4+4 =20	
Level 7	5	6	4	-	-	4	-	6	6+4+4+6 =20	(120) Bachelor Degree in Main Faculty
	6	6	4+4	-	-	-	-	6	6+4+4+6 =20	
Level 8	7	6	4	4 Resear-ch Metho-dology	-	-	-	6	4+4+4+6 =20	(160) Bachelor Degree (Honours/Research) in Main Faculty
	8	6	-	4	-	-	-	10	6+4+10 = 20	
Total		48	16	32	16	12	8	28	160 Credits	

BA (Bachelor of Arts)
Full-Time Eight Semester Programme
Choice Based Credit System (CBCS)

SYLLABUS
(Session:2021-2022)

DEPARTMENT OF A.I.H.C. & ARCHAEOLOGY

AWADHESH PRATAP SINGH UNIVERSITY
REWA (MP)

(101) मुख्य (Major)
पाठ्यक्रम शीर्षक– प्राचीन भारतीय इतिहास, संस्कृति और पुरातत्व का परिचय

उद्देश्य– इस पाठ्यक्रम का उद्देश्य विद्यार्थियों को प्राचीन भारतीय इतिहास संस्कृति एवं पुरातत्व के स्रोतो से लेकर प्रागैतिहास काल, आद्यैतिहासिक काल, ऐतिहासिक काल, पुरालिपिशास्त्र, अभिलेख शास्त्र, मुद्राशास्त्र, पुरातत्व का अन्य विषयों से सम्बन्ध तथा भारतीय कला एवं स्थापत्य आदि से परिचय कराना है।

ईकाई–1 अ. प्राचीन इतिहास, संस्कृति एवं पुरातत्व की परिभाषा एवं क्षेत्र।

ब. प्राचीन भारतीय इतिहास के स्त्रोत– पुरातात्विक, साहित्यिक एवं विदेशी यात्रियों का विवरण।

इकाई–2 अ. प्रागैतिहास काल का परिचय।

ब. आद्य ऐतिहासिक काल का परिचय।

इकाई–3 अ. ऐतिहासिक काल का परिचय।

ब. पुरातत्व का अन्य विषयों के साथ संबन्ध।

इकाई–4 अ. लिपिशास्त्र उत्पत्ति एवं विशेषताएँ।

ब. मुद्राशास्त्र उत्पत्ति एवं विशेषताएँ।

इकाई–5 अ. प्राचीन भारतीय कला की अवधारणा।

ब. मूर्तिकला एवं चित्रकला का उत्पत्ति एवं विकास।

स. स्थापत्यकला उत्पत्ति एवं विकास।

परिणाम (Outcome)– यह पाठ्यक्रम छात्रों को प्राचीन भारतीय इतिहास के अन्य पेपर को समझने में मदद करेगा। वे प्राचीन स्थलों और मानव के विचारों को बहुत सार्थक तरीके से समझने में सक्षम होंगे। साथ ही छात्रों को उनके कॅरियर की योजना बनाने में भी मदद करेगा क्योंकि भारतीय इतिहास किसी भी प्रतियोगी परीक्षा का एक प्रमुख हिस्सा रहा है।

संबन्धित ग्रंथ–

1. Allchin, B. and F. R. Allchin, The Rise of Civilization in India and Pakistan
2. MohanLal Chadhar: Art Architecture and Archaeology of India, New Delhi
3. Mahesh Chandra Shrivastva: Ancient History of India
4. Mahesh Chandra Shrivastva: Archaeology Theory and Practice
5. Percy Brown, Indian Architecture, Vol.1
6. बाशम, ए, एल, द वंडर दैट वाज इंडिया
7. पांडेय, जय नारायण, पुरातत्व विमर्श
8. व्हीलर, आर. ई. एम, पृथ्वी से पुरातत्व (अंग्रेजी और हिंदी)
9. अग्रवाल, वी.एस., पाणिनिकृत भारत (अंग्रेजी और हिंदी)
10. बाजपेयी, कृष्णदत्त, ऐतिहासिक भारतीय अभिलेख, जयपुर, राजस्थान
11. बाजपेयी संतोष कुमारः ऐतिहासिक भारतीय सिक्के, दिल्ली
12. विमल चन्द्र पाण्डेयः प्राचीन भारत का राजनैतिक एवं सांसकृतिक इतिहास, इलाहाबाद
13. मोहन लाल चढ़ारः प्राचीन भारतीय इतिहास संस्कृति तथा पुरातत्व, नई दिल्ली

(101) Major
Course Title : Introduction to Ancient Indian History, Culture and Archaeology

Course objective : The purpose of this course is to introduce the students to the sources of ancient Indian history, culture, and archaeology, from prehistoric times to historical periods, palaeography, epigraphy, numismatics, and their relations to other subjects of archaeology, Indian art, and architecture, etc.

Unit- 1 A. Ancient History, Culture, and Archaeology: Definition and Scope

B. Sources of Ancient Indian history: Archaeological, Literary, and foreign traveler's details

Unit- 2 A. Introduction to Prehistory.

B. Introduction to the Proto-historic Period.

Unit- 3 A. Introduction to the historical period.

B. The relationship of archaeology with other subjects.

Unit- 4 A. Origin and Characteristics of Palaeography.

B. Origin and characteristics of Numismatics.

Unit- 5 A. Concept of Ancient Indian art.

B. Origin and development of Sculpture and painting.

C. Origin and development of Architecture.

Course Learning Outcome (CLO) : This course will assist students in comprehending other papers on ancient Indian history. They will be able to understand ancient sites and human thoughts in a very meaningful way. It will also assist students in planning their careers, as Indian history is a major component of any competitive exam.

Suggested Books :

1. Allchin, B. and F. R. Allchin, The Rise of Civilization in India and Pakistan
2. MohanLal Chadhar: Art Architecture and Archaeology of India, New Delhi
3. Mahesh Chandra Shrivastva: Ancient History of India
4. Mahesh Chandra Shrivastva: Archaeology Theory and Practice
5. Percy Brown, Indian Architecture, Vol.1
6. बाशम, ए, एल, द वंडर दैट वाज इंडिया
7. पांडेय, जय नारायण, पुरातत्व विमर्श
8. व्हीलर, आर. ई. एम, पृथ्वी से पुरातत्व (अंग्रेजी और हिंदी)
9. अग्रवाल, वी.एस., पाणिनिकृत भारत (अंग्रेजी और हिंदी)
10. बाजपेयी, कृष्णदत्त, ऐतिहासिक भारतीय अभिलेख, जयपुर, राजस्थान
11. बाजपेयी संतोष कुमारः ऐतिहासिक भारतीय सिक्के, दिल्ली
12. विमल चन्द्र पाण्डेयः प्राचीन भारत का राजनैतिक एवं सांसकृतिक इतिहास, इलाहाबाद
13. मोहन लाल चढ़ारः प्राचीन भारतीय इतिहास संस्कृति तथा पुरातत्व, नई दिल्ली

(102) गौड (Minor)
पाठ्यक्रम शीर्षक– भारतीय दर्शन–I

उद्देश्य– दर्शन शास्त्र वह ज्ञान है जो परम् सत्य और सिद्धान्तों, और उनके कारणों की विवेचना करता है। दार्शनिक चिन्तन मूलतः जीवन की अर्थवत्ता की खोज का पर्याय है। इस पाठ्यक्रम का उद्देश्य छात्रों को दर्शन की प्रकृति, सभी तत्वमीमांसा और ज्ञानमीमांसा अवधारणाओं और शास्त्रीय और विषम भारतीय दर्शन के विचारों के बारे में सिखाना और प्रशिक्षित करना है जो उपनिषद, जैन, बौद्ध और चार्वाक दर्शन की मूल बातें गहराई से तल्लीन हैं।

इकाई–1

दर्शन का स्वरूप और प्रयोजन, भारतीय दर्शन का वर्गीकरण, भारतीय दर्शन की विशेषताएँ।

इकाई–2

वेदों का परिचय, उपनिषद् दर्शन– उपनिषदों की तत्वमीमांसा, ब्रह्म एवं आत्मा, भगवद्गीता– ज्ञानयोग, कर्मयोग और भक्तियोग।

इकाई–3

जैन दर्शन– जैन दर्शन का सामान्य परिचय, अनेकान्तवाद, स्याद्वाद, एवं कैवल्य/मोक्ष।

इकाई–4

बौद्ध दर्शन– चार आर्य सत्य एवं अष्टांगिक मार्ग।

बौद्ध धर्म के सामान्य दार्शनिक सिद्धान्त– प्रतीत्यसमुत्पाद एवं क्षणिकवाद।

इकाई–5

चार्वाक दर्शन– जड़वाद का अर्थ, तत्वज्ञान, आत्मा का विचार, चार्वाक दर्शन में आत्मा के चार मत, चार्वाक दर्शन में नैतिक विचार।

परिणाम (Outcomes) - यह पाठ्यक्रम छात्रों को महत्वपूर्ण और तुलनात्मक प्रकाश में प्रत्येक प्रणाली का मूल्यांकन करने में मदद करेगा। इस पाठ्यक्रम के माध्यम से छात्र प्राचीन विचारकों के दार्शनिक और समृद्ध सांस्कृतिक ज्ञान से रूबरू होंगे और यह भी आशा किया जाता हैं कि छात्रों के ज्ञान का दायरा काफी विस्तृत एवं व्यापक होगा।

संबन्धित ग्रंथ–

1. डॉ. चन्द्रधर शर्मा, भारतीय दर्शन अलोचन और अनुशीलन, मोतीलाल बनारसीदास, दिल्ली 1995
2. डॉ. बी.एन. सिंह एवं डॉ. आशा सिंह, भारतीय दर्शन, स्टूडेण्ट्स फ्रेण्ड्स एण्ड कम्पनी, काशी हिन्दू विश्वविद्यालय मार्ग लंका, वाराणसी–5, 1996
3. प्रो. हरेन्द्र प्रसाद सिन्हा, भारतीय दर्शन की रूपरेखा, मोतीलाल बनारसीदास, दिल्ली, 1963
4. बलदेव उपाध्याय, भारतीय दर्शन, शारदा मन्दिर वाराणसी, 1997
5. नन्द किशोर देवराज, भारतीय दर्शन, उत्तर प्रदेश हिन्दी ग्रन्थ अकादमी, लखनऊ, 1975
6- Dutta & Chatterjee, An Introduction to Indian Philosophy, University of Calcutta, 1968.
7. M. Hiriyanna, Outlines of Indian Philosophy, George Allen and Unwin, Lodon-1932.

(102) Minor
Course Title : Indian Philosophy- I

Course objective : Philosophy is the study of ultimate truths, principles, and the causes of these truths. Philosophical thinking is basically synonymous with the search for the meaning of life. The aim of this course is to teach and train the students about the nature of philosophy, all the metaphysical and epistemological concepts and ideas of classical and heterodox Indian philosophy, deeply engrossed in the basics of Upanishad, Jain, Buddhist, and Charvaka philosophies.

Unit- 1

Nature and Purpose of Philosophy, Classification of Indian Philosophy, Characteristics of Indian Philosophy.

Unit- 2

Introduction to the Vedas, Upanishad Philosophy - Metaphysics of Upanishads, Brahman and Atman.

Bhagavad Gita - Jnana Yoga, Karma Yoga and Bhakti Yoga.

Unit- 3

Jain Philosophy: General Introduction to Jain Philosophy, Syadvada, Anekantavada, and Kaivalya/Moksha.

Unit- 4

Buddhist Philosophy – Four Noble Truths & Eightfold Path,

General Philosophical Principles of Buddhism – Pratityasamutpad & kshanikvada

Unit- 5

Charvaka philosophy- meaning of materialism, idea of soul, four views of soul in Charvaka philosophy, moral ideas in Charvaka philosophy.

Course Learning Outcome (CLO) : This course will help students evaluate each system in a critical and comparative light. Through this course, students will be exposed to the philosophical and rich cultural knowledge of ancient thinkers, and it is also expected that the scope of knowledge of the students will be wide and deep.

Suggested Books :

1- Dutta & Chatterjee, An Introduction to Indian Philosophy, University of Calcutta, 1968.
2. M. Hiriyanna, Outlines of Indian Philosophy, George Allen and Unwin, Lodon-1932.
3. डॉ. चन्द्रधर शर्मा, भारतीय दर्शन अलोचन और अनुशीलन, मोतीलाल बनारसीदास, दिल्ली 1995
4. डॉ. बी.एन. सिंह एवं डॉ. आशा सिंह, भारतीय दर्शन, स्टूडेण्ट्स फ्रेण्ड्स एण्ड कम्पनी, काशी हिन्दू विश्वविद्यालय मार्ग लंका, वाराणसी–5, 1996
5. प्रो. हरेन्द्र प्रसाद सिन्हा, भारतीय दर्शन की रूपरेखा, मोतीलाल बनारसीदास, दिल्ली, 1963
6. बलदेव उपाध्याय, भारतीय दर्शन, शारदा मन्दिर वाराणसी, 1997
7. नन्द किशोर देवराज, भारतीय दर्शन, उत्तर प्रदेश हिन्दी ग्रन्थ अकादमी, लखनऊ, 1975

(103) वैकल्पिक (General Elective)
पाठ्यक्रम शीर्षक– प्राचीन भारतीय मानव मूल्य

उद्देश्य– मूल्य शिक्षा हमें अपनी आवश्यकताओं को समझने और अपने लक्ष्यों की सही कल्पना करने में सक्षम बनाती है और उनकी पूर्ति की दिशा भी बताती है। यह हमारे भ्रमों और अंतर्विरोधों को दूर करने में भी मदद करता है साथ ही मानव मूल्य निर्णय लेने के आधार बनते हैं। यह पाठ्यक्रम छात्रों को हमारे प्राचीन मानवीय मूल्यों से परिचित कराएगा, जिनकी उस समय के कई यात्रियों ने प्रशंसा की थी और बहुत लंबे समय तक भारतीय संस्कृति का हिस्सा बने रहे। प्राचीन भारतीय मानवीय मूल्यों का अध्ययन भारत की प्राचीन संस्कृति को स्थापित करने में मदद करेगा।

इकाई–1 अ. मानव मूल्य की अवधारणा, अर्थ एवं परिभाषाएँ।

ब. मानव मूल्य संबन्धी भारतीय चिन्तन एवं संस्थाएँ– आश्रम व्यवस्था एवं पुरूषार्थ।

इकाई–2 अ. सभ्यता एवं संस्कृति

ब. भारतीय संस्कृति की विशिष्टताएँ– वैदिक, मौर्य, गुप्त एवं राजपूत कालीन संस्कृति की मुख्य विशेषताएं।

इकाई–3 ब्राह्मण परम्परा में मानव मूल्य– त्रि–ऋण, पंचमहायज्ञ, उपनयन संस्कार एवं विवाह।

इकाई–4 श्रमण परम्परा में मानव मूल्य–

जैन एवं बौद्ध धर्म– त्रि–रत्न, अष्टांगिक मार्ग, पंचमहाव्रत एवं निर्वाण/मोक्ष।

इकाई–5 अ. मानव मूल्य के संवहन एवं संवर्धन में संस्थाओं का योगदान (परिवार एवं समाज)।

ब. शिक्षा के उद्देश्य एवं प्राचीन शिक्षा के प्रमुख केन्द्र (तक्षशीला, नालन्दा, विक्रमशीला)।

परिणाम (Outcome)– भारतीय संस्कृति अपनी विशेषताओं के कारण विश्व की अन्य संस्कृतियों से श्रेष्ठ है, जिसमें मानव मूल्यों की प्रधानता है परन्तु विभिन्न कारणों यथा, पारिवारिक विघटन, औद्योगिकीकरण, नगरो की ओर पलायन के कारण प्राचीन मूल्यों का ह्रास हो रहा है। प्रस्तुत पाठ्यक्रम का अध्ययन कर छात्र अपने सांस्कृतिक विरासत से परिचित होगें। साथ यह विषय विद्यार्थियों को भारतीय संस्कृति का संरक्षण करने में काफी मदद करेगा।

संबन्धित ग्रंथ–

1. सिंह, चन्द्रदेव– प्राचीन भारतीय एवं चिन्तन
2. मिश्र, जयशंकर– प्राचीन भारत का सामाजिक इतिहास
3. काणे, पाण्डुरंग वामन– (अनु. अर्जुन चौबे कश्यप)– धर्म शास्त्र का इतिहास
4. अग्रवाल, वासुदेव शरण– भारत की मौलिक एकता
5. वेदालंकार, हरिदत्त– हिन्दू परिकर सीमांकन
6. गोपाल, लल्लन जी एवं यादव, बी.एन.एस– भारतीय संस्कृति
7. जैन, जगदीश चन्द्र– जैन आगम साहित्य में भारतीय समाज
8. श्रीवास्तव, महेशचन्द्र– जैन धर्म एवं दर्शन
9. चढार, मोहन लाल, योग विज्ञान के मूलतत्व, नई दिल्ली
10- Altekar, A.S. – Education in Ancient India
11- Ayanger, K.B. Rangaswami– Some Anspects of Hindu view of life according of Hindu Dharmsashtra
12- Ayganger, Sin P.S. – Education of Hindu Moral Ideas.
13- Mohan Lal Chadhar: Cultural Heritage of Ancient India, New Delhi, 2020

(103) General Elective
Course Title : Ancient Indian Human Values

Course objective : Value education enables us to understand our needs and visualize our goals correctly and also guides the direction towards their fulfillment. It also helps to remove our misconceptions and contradictions and human values form the basis of decision making. This course will introduce the students to our ancient human values, which were admired by many travellers of that time and remained a part of Indian culture for a very long time. The study of ancient Indian human values will help in establishing the ancient culture of India.

Unit- 1 A. Human Value Concept, Meaning, and Definitions
B. Indian thought and institutions related to human values (Ashram system and Purushartha)

Unit- 2 A. Culture and Civilization
B. Features of Indian culture: Vedic, Maurya, Gupta, and Rajput culture.

Unit- 3 Human Values in the Brahmanical Tradition: Tri-Rina, Panchamahayagya, Upanayana Sanskar, and Marriage.

Unit- 4 Human Values in the Shramana Tradition-
Jainism and Buddhism: Tri-Ratna, Eightfold Path, Panchamahavrata, and Nirvana/Moksha.

Unit- 5 A. Institutional involvement in the transmission and promotion of human values (Family and Society)
B. Objectives of education and major centers of ancient education (Takshashila, Nalanda, Vikramshila)

Course Learning Outcome (CLO) : Due to its characteristics, Indian culture is superior to other cultures of the world due to its characteristics in which human values are predominant, but for various reasons, such as family disintegration, industrialization, and migration to cities, ancient values are declining. By studying the presented course, students will get acquainted with their cultural heritage. Also, this subject will help the students a lot in preserving Indian culture.

Suggested Books :

1. Altekar, A.S. – Education in Ancient India
2. Ayanger, K.B. Rangaswami– Some Anspects of Hindu view of life according of Hindu Dharmsashtra
3. Ayganger, Sin P.S. – Education of Hindu Moral Ideas.
4. Mohan Lal Chadhar: Cultural Heritage of Ancient India, New Delhi, 2020
5. सिंह, चन्द्रदेव– प्राचीन भारतीय एवं चिन्तन
6. मिश्र, जयशंकर– प्राचीन भारत का सामाजिक इतिहास
7. काणे, पाण्डुरंग वामन– (अनु. अर्जुन चौबे कश्यप)– धर्म शास्त्र का इतिहास
8. अग्रवाल, वासुदेव शरण– भारत की मौलिक एकता
9. वेदालंकार, हरिदत्त– हिन्दू परिकर सीमांकन
10. गोपाल, लल्लन जी एवं यादव, बी.एन.एस– भारतीय संस्कृति
11. जैन, जगदीश चन्द्र– जैन आगम साहित्य में भारतीय समाज
12. श्रीवास्तव, महेशचन्द्र– जैन धर्म एवं दर्शन
13. चढार, मोहन लाल, योग विज्ञान के मूलतत्व, नई दिल्ली

(104) Ability Enhancement (AE)
Course Title - English

Course Objective: The objectives of the course are to improve the competence of the student's basic language skills and to acquaint student with working official English Language.

Unit- I

Noun : Definition, Kinds of Noun, Functions of Noun, Number, Gender, Case and Common errors in use of Nouns. Framing of sentences using Nouns.

Pronoun : Definition, Kind of Pronoun, Functions of Pronoun, Number, Gender, Case and Common errors in use of Pronouns. Framing of sentences using Pronouns. One word Substitution, Synonyms and Antonyms.

Unit- II

Adjective : Definition of Adjective, Kinds of Adjective, Degree of an Adjective, Common Error in Use of Adjective. Framing of sentences using Adjectives, Words often Confused, Framing of sentences with pairs of confusing words, Correction of sentences.

Unit- III

Prepositions, Verbs, Articles, Adverb, function of Adverb, Framing the sentence using Adverb.

Unit- IV

Tense : Present, Past and Future

Unit- V

Letter Writing (both formal and informal)

Comprehension of unseen passage, Translation of a passage from English to Hindi.

Outcome: This course will hone reading, writing and over all communication skills of the participants which is very basic and imperative for almost all kind of management jobs in the organization. The graduates are expected to understand the process of communicating and interpreting the human experiences through literary representation using historical context and disciplinary methodologies.

Suggested Readings :

1. P.C. Wren and H. Martin, High School English Grammar and Composition.
2. G. Yule, Oxford Practice Grammar Book.
3. L. Walker, Basic English Composition by Bonnie.
4. Advanced English Grammar by Martin Hewings.

(201) मुख्य (Major)
पाठ्यक्रम शीर्षक– पुरातत्व की विधियाँ

उद्देश्य– इस पाठ्यक्रम का प्रमुख उद्देश्य विद्यार्थियों को अतीत की जानकारी एवं वर्तमान से तुलनात्मक अध्ययन किया जायेगा जिसमें पाषाण काल से ऐतिहासिक काल तक के पुरावशेषों को प्राप्त करने के लिए पुरातत्व की विभिन्न विधियों का प्रयोग कर निष्कर्ष तक पहुचेंगे ताकि विद्यार्थियों को विभिन्न आयामों का ज्ञान हो सके।

इकाई–1

1. पुरातत्व की परिभाषा, अध्ययन क्षेत्र एवं उद्देश्य।
2. भारतीय पुरातत्व का इतिहास।

इकाई–2

1. सर्वेक्षण की विधियाँ एवं उद्देश्य
2. उत्खनन के आवश्यक उपकरण तथा पुरातात्विक सामग्रियाँ।

इकाई–3

1. उत्खनन की विधियाँ।
2. स्तरीकरण।
3. छायांकन।

इकाई–4

1. सामाग्रियों का वर्गीकरण।
2. मृदभाण्डों के प्रकार– गैरिक मृदभाण्ड, चित्रित धूसर मृदभाण्ड, उत्तरी कृष्णमार्जित मृदभाण्ड।

इकाई–5

महत्वपूर्ण स्थलों का अध्ययन–
आदमगढ़, भीमबेटका एवं बेलन घाटी, सराय नाहर राय, मेहरगढ़, कोल्डीहवा, मालवा, जोर्वे, एरण, इटहा, देउरकोठार।

परिणाम (Outcome)- इस पाठ्यक्रम के अध्ययन के पश्चात् विद्यार्थी पुरातत्व की विभिन्न विधियों से परिचित हो होगें। यह पुरातात्विक विधि पुरातात्विक अवशेषों का विश्लेषण करने में महती भूमिका निभायेगा साथ ही विद्यार्थियों को उचित निष्कर्ष एवं वैज्ञानिकपूर्ण निर्णय में काफी मदद करेगा।

सहायक ग्रंथ–

1. जे. एन. पाण्डेय– पुरातत्व विमर्श
2. मनमोहन सिंह– पुरातत्व की रूपरेखा
3. राधाकान्त वर्मा– क्षेत्रीय पुरातत्व
4. राधाकान्त वर्मा– पुरातत्व अनुशीलन
5. B. Allchin And Raymond- Origins of Civilization
6. Martimer Wheeler – Archaeology from the Earth
7. Sushmita Panday – Archaeological Methods and Techniques

(201) Major
Course Title : Methods of Archaeology

Course objective : The main objective of this course will be to make the students aware of the past and comparative study with the present, in which to get the antiquities from the Stone Age to the historical period, they will reach the conclusion by using different methods of archaeology, so that the students will have knowledge of different dimensions.

Unit - 1

A. Definition of Archaeology, Study Areas and Objectives.
B. A History of Indian Archaeology.

Unit - 2

A. Methods & purpose of survey.
B. Necessary tools for excavation and archaeological materials.

Unit - 3

A. Methods of excavation.
B. Stratification
C. Chāyāṅkana.(Photography)

Unit - 4

A. Classification of materials.
B. Types of pottery- Ochre Coloured Pottery, Painted grey ware, Northern black polished ware.

Unit - 5

Study of important sites-

Adamgarh, Bhimbetka and Belan Valley, Sarai Nahar Rai, Mehrgarh, Koldihwa, Malwa, Jorwe, Eran, Itha, Deurkothar

Course Learning Outcome (CLO) : After studying this course, students will be familiar with different methods of archaeology. This archaeological method will play an important role in analysing the archaeological remains as well as help the students a lot in making proper conclusions and scientific decisions.

Suggested Books-

8. B. Allchin And Raymond- Origins of Civilization
9. Martimer Wheeler – Archaeology from the Earth
10. Sushmita Panday – Archaeological Methods and Techniques
11. जे0एन0 पाण्डेय– पुरातत्व विमर्श
12. मनमोहन सिंह– पुरातत्व की रूपरेखा
13. राधाकान्त वर्मा– क्षेत्रीय पुरातत्व
14. राधाकान्त वर्मा– पुरातत्व अनुशीलन

(202) गौड़ (Minor)
पाठ्यक्रम शीर्षक– भारतीय दर्शन–II

उद्देश्य– इस पाठ्यक्रम का उद्देश्य छात्रों को भारतीय षड् दर्शन सांख्य, न्याय, वैशेषिक, योग, मीमांसा एवं वेदांत की सभी आध्यात्मिक और ज्ञानमीमांसात्मक अवधारणाओं और विचारों के बारे में पढ़ाना और प्रशिक्षित करना है।

इकाई–1

सांख्य दर्शन– सांख्य दर्शन का सामान्य परिचय, सत्कार्यवाद, पुरूष, प्रकृति, विकासवाद के सिद्धान्त एवं कैवल्य।

इकाई–2

न्याय दर्शन– न्याय दर्शन का सामान्य परिचय, प्रमाण–विचार, प्रत्यय, अनुमान, शब्द, उपमान, तत्वमीमांसा।

इकाई–3

वैशेषिक दर्शन– वैशेषिक दर्शन का सामान्य परिचय, पदार्थ–निरूपण, परमाणुवाद, सृष्टि और प्रलय।

इकाई–4

योग दर्शन– योग दर्शन का सामान्य परिचय, चित्त विज्ञान, समाधि का स्वरूप, अष्टांग योग, ईश्वर का स्वरूप, कैवल्य।

इकाई–5

1. मीमांसा दर्शन– प्रमाण विचार, तत्व विचार, आत्मा का विचार एवं मोक्ष।
2. वेदान्त दर्शन– तत्वमीमांसा, ज्ञान–मीमांसा एवं मोक्ष का स्वरूप।
3. भारतीय दर्शन की प्रांसागिकता।

परिणाम (Outcome)- इस पाठ्यक्रम के माध्यम से छात्र प्राचीन भारतीय विचारकों के दार्शनिक सिद्धांतों का अध्ययन करेगें। साथ ही भारत की समृद्ध सांस्कृतिक ज्ञान से रूबरूब होंगे। यह विषय प्रतियोगी परीक्षाओं के लिए काफी हितकर होगा।

संबन्धित ग्रंथ–

1. डॉ. चन्द्रधर शर्मा, भारतीय दर्शन अलोचन और अनुशीलन, मोतीलाल बनारसीदास, दिल्ली 1995
2. डॉ. बी.एन. सिंह एवं डॉ. आशा सिंह, भारतीय दर्शन, स्टूडेण्ट्स फ्रेण्ड्स एण्ड कम्पनी, काशी हिन्दू विश्वविद्यालय मार्ग लंका, वाराणसी 1996
3. प्रो. हरेन्द्र प्रसाद सिन्हा, भारतीय दर्शन की रूपरेखा, मोतीलाल बनारसीदास, दिल्ली, 1963
4. बलदेव उपाध्याय, भारतीय दर्शन, शारदा मन्दिर वाराणसी, 1997
5. नन्द किशोर देवराज, भारतीय दर्शन, उत्तर प्रदेश हिन्दी ग्रन्थ अकादमी, लखनऊ, 1975

6- Dutta & Chatterjee, An Introduction to Indian Philosophy, University of Calcutta, 1968

7- M. Hiriyanna, Outlines of Indian Philosophy, George Allen and Unwin, Lodon-1932

(202) Minor
Course Title : Indian Philosophy-II

Course objective : The objective of this course is to teach and train the students about all the spiritual and epistemological concepts and ideas of Indian Shad Darshana, Samkhya, Nyaya, Vaisheshika, Yoga, Mimamsa, and Vedanta.

Unit - 1

Sankhya Philosophy : A General Introduction to Sankhya Philosophy, Satkaryavada, Purusa, Prakriti, Principles of Evolution, and Kaivalya.

Unit - 2

Nyaya Philosophy : General Introduction to the Philosophy of Nyaya, Praman-vichar, Pratyaksha, Anuman, Shabda, Upamana, Metaphysics.

Unit - 3

Vaisheshik Darshana : A general introduction to Vaisheshik philosophy, Padarth-Nirupan, Atomism (paramaanuvaad), Srshti (Creation) and Pralay (Holocaust).

Unit - 4

Yoga Darshan : General Introduction to Yoga Darshan, Chitta Vigyan, The form of Samadhi, Ashtanga Yoga, The form of God, Kaivalya.

Unit - 5

A. Mimamsa Philosophy : Proof thought, elemental thought, idea of soul and salvation.
B. Vedanta philosophy : metaphysics, epistemology and The form of salvation
C. Relevance of Indian Philosophy.

Course Learning Outcome (CLO) : Through this course, students will study the philosophical principles of ancient Indian thinkers. Along with this, you will get acquainted with the rich cultural knowledge of India. This topic will be very beneficial for competitive exams.

Suggested Books :

8- Dutta & Chatterjee, An Introduction to Indian Philosophy, University of Calcutta, 1968
9- M. Hiriyanna, Outlines of Indian Philosophy, George Allen and Unwin, Lodon-1932
10. डॉ. चन्द्रधर शर्मा, भारतीय दर्शन अलोचन और अनुशीलन, मोतीलाल बनारसीदास, दिल्ली 1995
11. डॉ. बी.एन. सिंह एवं डॉ. आशा सिंह, भारतीय दर्शन, स्टूडेण्ट्स फ्रेण्ड्स एण्ड कम्पनी, काशी हिन्दू विश्वविद्यालय मार्ग लंका, वाराणसी 1996
12. प्रो. हरेन्द्र प्रसाद सिन्हा, भारतीय दर्शन की रूपरेखा, मोतीलाल बनारसीदास, दिल्ली, 1963
13. बलदेव उपाध्याय, भारतीय दर्शन, शारदा मन्दिर वाराणसी, 1997
14. नन्द किशोर देवराज, भारतीय दर्शन, उत्तर प्रदेश हिन्दी ग्रन्थ अकादमी, लखनऊ, 1975

(203) वैकल्पिक (General Elective)
पाठ्यक्रम शीर्षक– भारत में विरासत प्रबंधन

उद्देश्य– इस पाठ्यक्रम का उद्देश्य विद्यार्थियों को सांस्कृतिक विरासत से परिचित कराना है जिसके अन्तर्गत विरासत का अर्थ, परिभाषा, विरासत प्रबंधन व्यवस्था, संरक्षण एवं परिरक्षण इत्यादि के साथ मध्य प्रदेश के मूर्त एवं अमूर्त सांस्कृतिक विरासत का विस्तृत अध्ययन कराना है।

इकाई–1

विरासत की अर्थ एवं परिभाषा, विरासत का उत्पत्ति और प्रकार।
विरासत प्रबंधन की अवधारणा, चुनौतियाँ एवं सतत विकास।

इकाई–2 सांस्कृतिक विरासत प्रबंधन के स्त्रोत एवं योजना–

1. सांस्कृतिक विरासत अध्ययन के स्त्रोत।
2. मूर्त एवं अमूर्त विरासत।
3. विरासत प्रबंध के लिए योजना और रणनीतियाँ।

इकाई–3 विरासत प्रबंधन–

1. भारत में विरासत प्रबन्धन कानून।
2. कलात्मक वस्तुओं की तस्करी की समस्याएँ।
3. विरासत संरक्षण में संग्रहालयों की भूमिका।

इकाई–4 संरक्षण एवं परिरक्षण–

1. संरक्षण एवं परीक्षण की प्रमुख विधियाँ।
2. विरासत संसाधनों के रखरखाव की विधियाँ।
3. विरासत प्रबंधन संगठन– भारतीय पुरातत्व सर्वेक्षण।

इकाई–5 सांस्कृतिक विरासत–

1. भीमबेटका, सांची एवं खजुराहो।
2. अजंता, एलोरा एवं मांडा।
3. नचना, भूमरा एवं सोहागपुर।

परिणाम (Outcome)- इस पाठ्यक्रम के अध्ययन से विद्यार्थी, विरासत से संबंधित मूलभूत अवधारणाओं और विरासत चुनौतियों का ज्ञान प्राप्त करेंगे। वे सांस्कृतिक विरासत के विभिन्न स्त्रोतों, मूर्त–अमूर्त विरासतों और विरासत प्रबंधन में डिजिटल प्रौद्योगिकी की भूमिका, संरक्षण एवं परिरक्षण की पद्धतियों की विस्तृत जानकारी प्राप्त करने में सक्षम होंगे। उक्त विषयों के अध्ययन के पश्चात विद्यार्थी अपनी सांस्कृतिक विरासतों का संरक्षण स्वयं करेंगे और दूसरों को भी प्रेरित करेंगे।

संबन्धित ग्रंथ–

1. पृथ्वीं कुमार अग्रवाल, प्राचीन भारतीय कला एवं वास्तु वाराणसी, 2002
2. डॉ. जय नारायण पाण्डेय, भारतीय कला एवं पुरातत्व, प्रयानिक पब्लिकेशन, इलाहाबाद
3. कृष्ण दत्त वाजपेयी, इंडियन न्यूनियेसट्रिक स्टडीज, नई दिल्ली, 1976
4. बरूआ और सिन्हा, भरहुत इन्सिक्रशन्स, कलकत्ता, 1926
5. Adishakti Laretna T. (2012), Heritage Management A Professional of the Opportunity Future Asmita Samwaad.
6. B. Cardon de Lichtbure (2002), Heritage and Sustainable development, Naturopa, the Coucil of Europe.
7. Protection of manuments, Ministry of Tourism and Culture, Press Information Bureau, Dec 4, 2007.
8. Bhatt Mihir (2012) Heritage Manegement A Professional Opportunity for the Future, Asmita Samwad.

(203) General Elective
Course Title : Heritage Management in India

Course objective : The objective of this course is to introduce the students to cultural heritage, including the meaning, definition, heritage management system, conservation and preservation, etc.

Unit – 1 Meaning and definitions of Heritage, Origin and types of Heritage.
Concepts of Heritage management. challenges and sustainable development.

Unit - 2 Sources And Scheme Of Cultural Heritage Management-
A. Sources of Cultural Heritage Studies.
B. Tangible and Intangible Heritage.
C. Planning and Strategies for Heritage Management.

Unit - 3 Heritage Management-
A. Heritage Management Laws in India.
B. Problems of smuggling of art objects.
C. The Role of Museums in Heritage Conservation.

Unit - 4 Protection and Preservation-
A. Major methods of conservation and testing.
B. Methods of maintenance of Heritage resources.
C. Heritage Management Organization- Archaeological Survey of India.

Unit - 5 Cultural Heritage-
A. Bhimbetka, Sanchi and Khajuraho.
B. Ajanta, Ellora and Manda.
C. Nachna, Bhumra and Sohagpur.

Course Learning Outcome (CLO) : By studying this course, students will gain knowledge of the fundamental concepts related to heritage and the challenges of heritage. They will be able to get a detailed understanding of the various sources of cultural heritage, tangible and intangible, and the role of digital technology in heritage management, methods of conservation and preservation. After studying the above subjects, the students themselves will preserve their cultural heritage and will also inspire others.

Suggested Books :

9. Adishakti Laretna T. (2012), Heritage Management A Professional of the Opportunity Future Asmita Samwaad.
10. B. Cardon de Lichtbure (2002), Heritage and Sustainable development, Naturopa, the Coucil of Europe.
11. Protection of manuments, Ministry of Tourism and Culture, Press Information Bureau, Dec 4, 2007.
12. Bhatt Mihir (2012) Heritage Manegement A Professional Opportunity for the Future, Asmita Samwad.
13. पृथ्वीं कुमार अग्रवाल, प्राचीन भारतीय कला एवं वास्तु वाराणसी, 2002
14. डॉ. जय नारायण पाण्डेय, भारतीय कला एवं पुरातत्व, प्रयानिक पब्लिकेशन, इलाहाबाद
15. कृष्ण दत्त वाजपेयी, इंडियन न्यूनियेसट्रिक स्टडीज, नई दिल्ली, 1976
16. बरूआ और सिन्हा, भरहुत इन्सिक्रशन्स, कलकत्ता, 1926

(204) Ability Enhancement (AE)
Course Title – Environment

उद्देश्य– इस पाठ्यक्रम के माध्यम से विद्यार्थी पर्यावरणीय जानकारियों से रूबरूब होंगे। जिसमें पर्यावरण का अर्थ परिभाषा, क्षेत्र एवं महत्व, भारतीय संस्कृति में पर्यावरण संबन्धी अवधारणा, बायोम, पारिस्थितिकी तंत्र, जैव विविधता, प्राकृतिक संसाधन, प्रदुषण, राष्ट्रीय एवं अन्तर्राष्ट्रीय समझौते आदि विषयों का गहन अध्ययन करेंगे।

इकाई – 1 पर्यावरण–

परिभाषा, क्षेत्र एवं महत्व, भारतीय संस्कृति में पर्यावरण, पर्यावरण सुरक्षा हेतु जनजागरूकता।

इकाई – 2 बायोम एवं पारिस्थितिकी तंत्र–

1. बायोम– उष्णकटिबंधीय, शीतोष्ण, वन, घास का मैदान, मरूस्थल, टुण्ड्रा एवं आर्द्रभूमि।
2. पारिस्थितिक तन्त्र की संरचना, कार्य एवं प्रकार व इनका संरक्षण तथा पुनः स्थापन।

इकाई – 3 जैव विविधता–

1. जैव विविधता और उसका संरक्षण, जैव विविधता– परिचय, समस्याएँ एवं संरक्षण**,** जैव विविधता के स्तर– अनुवांषिक, जातीय एवं परिस्थितिक विविधता, भारत का जैव–भौगोलिक वर्गीकरण।

इकाई – 4 प्राकृतिक संसाधन–

1. परिचय, समस्याएँ एवं संरक्षण, प्राकृतिक संसाधनों के विभिन्न प्रकार– वन, भूमि, खाद्य, ऊर्जा एवं जल।

इकाई – 5 पर्यावरण प्रदूषण, प्रबंधन, सामाजिक मुद्दे, राष्ट्रीय एवं अन्तर्राष्ट्रीय समझौता–

1. प्रदुषण के प्रकार, नियंत्रण के उपाय, प्रबंधन एवं उससे जुड़ी समस्याएँ।
2. पर्यावरण कानून एवं अधिनियम।
3. पर्यावरण आंदोलन, संचार एवं जनजागरूकता कार्यक्रम।
4. पर्यावरण संरक्षण एवं नियंत्रण से संबंधित राष्ट्रीय एवं अन्तर्राष्ट्रीय संगठन।

परिणाम (Outcome) - इस पाठ्यक्रम के अध्ययन के पश्चात् विद्यार्थी पर्यावरण से संबंधित सभी प्रकार की जानकारियों से परिचित होंगे। साथ ही यह पाठ्यक्रम विद्यार्थियों को पर्यावरण के संरक्षण की चेतना को विकसित करने में मदद करेगा। इसके अतिरिक्त यह विषय विद्यार्थियों को प्रतियोगी परीक्षाओं के लिए भी काफी हितकर साबित होगा।

संबन्धित ग्रंथ–

1. डॉ0 सतीश कुमार एवं डॉ0 दीपशिखा– पर्यावरणीय अध्ययन बी बी पी पब्लिकेशन्स, मेरठ
2. डॉ. वीरेन्द्र सिंह यादव, भारतीय संस्कृति में पर्यावरण चिन्तन के विविध आयाम, ओमेगा पब्लिकेशन्स, नई दिल्ली, 2010
3. डॉ. दया शंकर त्रिपाठी, पर्यावरण अध्ययन, मोतीलाल बनारसीदास, दिल्ली, 2005
4. डी.एस. त्रिपाठी, पर्यावरण चेतना 1997
5. Satish Kumar and Deepshikha- Environmental Studies, BBP Publication, Meerut UP,
6. P.D. Sharma- Elements of Ecology, 1988

(204) Ability Enhancement (AE)
Course Title : Environment

Course objective : Through this course, students will be exposed to environmental knowledge. In which the meaning, definition, area and importance of the environment, concepts related to the environment in Indian culture, biomes, ecosystems, biodiversity, natural resources, pollution, national and international agreements, etc. will be studied deeply.

Unit - 1 Environment-

Definition, scope and importance, environment in Indian culture, public awareness for environmental protection.

Unit - 2 Biomes and Ecosystem-

A. Biomes- Tropical, temperate, forest, grassland, desert, tundra and wetland.
B. Structure, functions and types of ecosystems and their conservation and restoration.

Unit - 3 Biodiversity-

Biodiversity and its Conservation, Biodiversity- Introduction, Problems and Conservation, Levels of Biodiversity- Genetic, Ethnic and Ecological Diversity, Bio-geographical Classification of India.

Unit - 4 Natural Resources-

Introduction, problems and conservation, different types of natural resources- forest, land, food, energy and water.

Unit - 5 Environmental Pollution, Management, Social Issues, National and International Convention-

A. Types of pollution, control measures, management and related problems.
B. Environmental Laws and Acts.
C. Environmental movement, communication and public awareness programmes.
D. National and international organizations related to environmental protection and control.

Course Learning Outcome (CLO) : After studying this course, students will be familiar with all kinds of information related to the environment. Also, this course will help the students develop an awareness of conservation of the environment. Apart from this, this subject will also prove to be very beneficial for students preparing for competitive examinations.

Suggested Books :

7. Satish Kumar and Deepshikha- Environmental Studies, BBP Publication Pvt. Ltd. Meerut, UP.
8. P.D. Sharma- Elements of Ecology, 1988
9. डॉ0 सतीश कुमार एवं डॉ0 दीपशिखा– पर्यावरणीय अध्ययन बी बी पी पब्लिकेशन्स, मेरठ
10. डॉ. वीरेन्द्र सिंह यादव, भारतीय संस्कृति में पर्यावरण चिन्तन के विविध आयाम, ओमेगा पब्लिकेशन्स, नई दिल्ली, 2010
11. डॉ. दया शंकर त्रिपाठी, पर्यावरण अध्ययन, मोतीलाल बनारसीदास, दिल्ली, 2005
12. डी.एस. त्रिपाठी, पर्यावरण चेतना 1997

DEPARTMENT OF ENGLISH

AWADHESH PRATAP SINGH UNIVERSITY, REWA

B. A. English-Sem.-I

S.No.	Paper Name	Credits	Scheme of Marks		Total
			External	Internal	
Paper-1	Major –British Poetry and Drama 14th and 17th Centuries	6	60	40	100
Paper-2	Minor- General Psychology	6	60	40	100
Paper-3	Generic Elective – Academic Writing and Composition	4	60	40	100
Paper-4	Ability Enhancement Compulsory course: English Communication	4	60	40	100
		20			400

B.A. English Sem.-II

S.No.	Paper Name	Credits	Scheme of Marks		Total
			External	Internal	
Paper-1	Major- European Classical Literature	6	60	40	100
Paper-2	Minor- Community Psychology	6	60	40	100
Paper-3	Generic Elective- Media and Communication Skills	4	60	40	100
Paper-4	Ability Enhancement Compulsory course Environment studies	4	60	40	1O0
		20			400

PAPER- 1

Major

BRITISH POETRY AND DRAMA: 14TH TO 17TH CENTURIES

Course Credits: 6

Learning Outcomes

Some of the course learning outcomes that students of this course are required to demonstrate run thus: understand the tradition of English literature from 14th to 17th centuries.

- develop a clear understanding of Renaissance Humanism that provides the basis for
- the texts suggested engage with the major genres and forms of English literature and develop
- fundamental skills required for close reading and critical thinking of the texts and concepts appreciate and analyze the poems and plays in the larger socio-political and religious
- contexts of the time.

Course Content

1. Poetry from Chaucer to Donne

1.1 **Geoffrey Chaucer** *The Wife of Bath's Prologue*

1.2 Edmund Spenser Selections from *Amoretti*:

Sonnet LXVII 'Like as a huntsman...'

Sonnet LVII 'Sweet warrior...'

Sonnet LXXV 'One day I wrote her name...'

1.3 John Donne: 'The Sunne Rising',

'Batter My Heart'

'Valediction: Forbidding Mourning'

2. **Christopher Marlowe** : *Doctor Faustus*

3**. William Shakespeare** *Macbeth*

4. **William Shakespeare** *Twelfth Night*

5. **John Milton** *On His Blindness* and *Lycidas*

Suggested Topics

- Renaissance Humanism
- The Stage, Court and City
- Religious and Political Thought
- Ideas of Love and Marriage

- The Writer in Society

Suggested Readings

- Pico Della Mirandola, excerpts from the *Oration on the Dignity of Man,* in *The Portable Renaissance Reader,* ed. James Bruce Ross and Mary Martin McLaughlin (New York: Penguin Books, 1953) pp. 476–9.
- John Calvin, 'Predestination and Free Will', in *The Portable Renaissance* Reader,ed. James Bruce Ross and Mary Martin McLaughlin (New York: Penguin Books,1953) pp. 704–11.
- Baldassare Castiglione, 'Longing for Beauty' and 'Invocation of Love', in Book 4 of *The Courtier*, 'Love and Beauty', tr. George Bull (Harmondsworth: Penguin, rpt. 1983) pp. 324– 8, 330–5.
- Philip Sidney, *An Apology for Poetry*, ed. Forrest G. Robinson (Indianapolis: Bobbs-Merrill, 1970) pp. 13–18.

Paper-2

Minor-**General Psychology**

Course Credits: 6

Learning Outcomes

1. Developing knowledge of the basic concepts in psychology.

2. Developing skills for applying psychological knowledge to real life situations so as to improve interpersonal interactions and adjustment in life.

Course Content

Unit 1:

1.1 Nature of Psychology: Definition, Schools of modern psychology

1.2 Psychology in India: History and current status

Unit 2: Orientation to Psychology: Nature, fields and applications of psychology;

Cognitive Processes: Learning, memory and problem solving;

Conative Processes: Motivation, types of motives (Sociogenic/Psychogenic motives);

Affective Processes: Emotion, Positive and negative emotion

Unit 3: Psychology of Individual Differences: Theories of personality: Freudian psychoanalysis, type and trait; humanistic;

Theories of intelligence: Spearman 'g' theory, Sternberg and Gardner; Emotional intelligence;

Assessment of intelligence and personality

Unit 4: Understanding Developmental Processes: Cognitive Development: Piaget; Moral Development: Kohlberg;

Psycho-social Development: Erikson

Unit 5: Applications of Psychology: Work; Health

References:

Ciccarelli , S. K & Meyer, G.E (2008). Psychology (South Asian Edition). New Delhi: Pearson

Feldman.S.R. (2009).Essentials of understanding psychology (7th Ed.) New Delhi : Tata McGraw Hill.

Michael ,W., Passer, Smith,R.E. (2007). Psychology The science of mind and Behavior. New Delhi:Tata McGraw-Hill

Paper-3

Generic Elective: ACADEMIC WRITING AND COMPOSITION

Course Credits: 4

Learning Outcomes

Students will learn to

- convey their ideas in English using simple and acceptable English in writing
- understand to recognize and draft different types of writing – e.g. classroom notes,
- summaries, reports, exploratory and descriptive paragraphs, substantiating etc describe a diagram or elaborate information contained in a graph, chart, table etc
- write a review of a book or a movie
- write a report on an academic or cultural event that takes place in a college or university for a journal or a newspaper

Course Contents

1.1. Introduction to the Writing Process

1.2. Introduction to the Conventions of Academic Writing

2.1. Writing in one's own words: Summarizing and Paraphrasing

2.2. Study Skills including note making, note taking, information transfer, reviewing etc.

3. Structuring an Argument: Introduction, Interjection, and Conclusion

4. Critical Thinking: Syntheses, Analyses, and Evaluation

5. Citing Resources; Editing, Book and Media Review

Suggested Readings

Liz Hamp-Lyons and Ben Heasley, *Study writing: A Course in Writing Skills for Academic Purposes* (Cambridge: CUP, 2006).

Renu Gupta, *A Course in Academic Writing* (New Delhi: Orient BlackSwan, 2010).

Ilona Leki*, Academic Writing: Exploring Processes and Strategies* (New York: CUP, 2nd edn, 1998).

Gerald Graff and Cathy Birkenstein, *They Say/I Say: The Moves That Matter in Academic Writing* (New York: Norton, 2009).

Eastwood, John. (2005) *Oxford Practice Grammar*. Oxford, OUP

Wallace, Michael. (2004). *Study Skills*. Cambridge, CUP

Paper-4

AECC: English Communication

Course Credits: 4

Learning Objectives:

The purpose of this course is to introduce students to the theory, fundamentals and tools of communication and to develop in them vital communication skills which should be integral to personal, social and professional interactions.

1. **Basic Language Skills**:

1.1 Vocabulary Building: Suffix, Prefix, Synonyms, Antonyms, Homophones, Homonyms and one-word substitution.

1.2. Basic Grammar: Noun, Pronoun, Adjective, Verb, Adverb, Prepositions, Articles, Time and Tense

2.1. **Introduction: Theory of Communication, Types and modes of Communication**

2.2. Language of Communication: Verbal and Non-verbal (Spoken and Written) Personal, Social and Business Barriers and Strategies Intra-personal, Inter-personal and Group communication

3. **Speaking Skills:**

Monologue

Dialogue

Group Discussion

Effective Communication/ Mis- Communication

Interview

Public Speech

4. **Reading and Understanding**

Close Reading

Comprehension

Summary

Paraphrasing

Analysis and Interpretation

5. **Writing Skills**:

Documenting,

Report Writing,

Making notes,

Letter writing

Recommended Readings:

1. Fluency in English - Part II, Oxford University Press, 2006.

2. Business English, Pearson, 2008.

3. Language, Literature and Creativity, Orient Blackswan, 2013.

4. Language through Literature (forthcoming) ed. Dr. Gauri Mishra, Dr Ranjana Kaul, Dr Brati Biswas

Learning Outcomes :

1. Prepare for various competitive exams by developing their English language competence.

2. Promote their comprehension skills being exposed to a variety of texts and their interpretations

3. Build and enhance their vocabulary.

4. Develop their communication skills by strengthening grammar and usages.

It is hoped that after studying this course, students will find a difference in their personal and professional interactions.

PAPER 1:

Type - Major

Title -EUROPEAN CLASSICAL LITERATURE

Course Credits: 6

Learning Outcomes :

- historically situate classical European, i.e., Greek and Latin literary cultures and their
- socio-political-cultural contexts engage with classical literary traditions of Europe from the beginning till the 5th
- century AD grasp the evolution of the concept of classic and classical in the European literary
- thinking and its reception over a period of time appreciate classical literature of Europe and pursue their interests in it
- examine different ways of reading and using literary texts across a wide range of classical authors, genres and periods with comparative perspectives
- develop ability to pursue research in the field of classic
- develop academic and practical skills in terms of communication and presentation and also learn about human and literary values of classical period

Course Content

1.Classical Drama:

1.1 Comedy and Tragedy in Classical Drama

1.3 Literary Culture in Augustan Rome

2**. Classical Epic Poetry**

Homer: selections from *The Illiad*

Virgil, selections from the *Aeneid*

3. **Classical Tragedy**

Sophocles: *Antigone* or Oedipus Rex

a. Oedipus Rex: Summary and analysis

b. Oedipus Rex : a classical and modern tragedy

4. Classical Poetry

4.1 Horace : Life and works

4.2 Horace: *Satires (*textual analysis)

5.**Classical Comedy**

Plautus: Selections from *The Ghost or Menaechmi*

Suggested Readings

Homer, *The Illiad*. Tr. E.V. Rieu. Harmondsworth: Penguin, 1985.

Sophocles, *Oedipus the King*. Tr. Robert Fagles in *Sophocles: The Three Theban Plays.* Harmondsworth: Penguin, 1984.

Richard Rutherford*, Classical Literature: A Concise History*. Oxford: Blackwell Publishing, 2005.

Paper -2

Type-Minor

Community Psychology

Course Credits: 6

Learning Outcomes

1. Understanding the role of Psychology in development.

2. Developing an appreciation of the core values that guide community psychology and facilitate community functions.

3. Developing insights with respect to health promotion programs in communities

4. Community programme for child and maternal health, for physically challenged and elderly people in the Indian context, through case studies

Course Content

1. **Introduction to community Psychology**

Definition of community psychology;

Types of communities – locality based and relational;

Models: ecological level analysis of community, conceptual level model.

2. **Core values in community psychology**:

- Individual and family wellness;
- sense of community;
- respect for human diversity;
- social justice;
- empowerment and citizen participation;
- collaboration and community strengths.

3.**Community functions** – learning, socialization, and supportive functions.

4**. Communities as setting for health promotion**

4.1 Need and process of community organization and building for health promotion programming
4.2 Community programme for child and maternal health, for physical challenged and old age in the Indian context.

5. **Interventions for Community Development and Empowerment**

5.1 Concept and practices for community development and empowerment

5.2 Case studies of community intervention programs by the governmental and nongovernmental organizations in Indian context such as, rural panchayat programs, children's education, citizen right, self- help group, social accounting.

Suggestive readings:

- Banerjee, A., Banerji, R., Duflo, E., Glenneske, R., & Khenani, S. (2006) Can Information Campaign start local participation and improve outcomes? A study of primary education in Uttar Pradesh, India, World Bank Policy Research, Working Paper No.3967
- Fetterman, D.M., Kaftarian, S.J. & Wandersman, A (Eds)(1996) Empowerment Evaluation, New Delhi : Sage Publication.
- Kloos B. Hill, J Thomas, Wandersman A, Elias M.J. & Dalton J.H. (2012). Community Psychology: Linking Individuals and Communities, Wadsworth Cengage Learning.
- McKenzie, J. F. Pinger, R. R. & Kotecki, J. E. (2005). An introduction to community health. United States: Jones and Bartlett Publishers.
- Misra, G. (Ed). (2010) Psychology in India. Indian Council of Social Science Research. Dorling Kindersley (India) Pvt Ltd. Pearson Education
- Poland, B. D., Green, L.W. & Rootman, I.(2000) Setting for Health Promotion: Linking Theory and Practice, Sage Publication, New Delhi

PAPER- 3:

Generic Elective Course

MEDIA AND COMMUNICATION SKILLS

Course Credits: 4

Learning Outcomes

- develop the professional ability to communicate information clearly and effectively in all kinds of environment and contexts.
- demonstrate practical skills of various types of media writing, reviews, reports,
- programmes and discussions demonstrate their familiarity with the new media, its techniques, practices of socialmedia and hypermedia.
- critically analyze the ways in which the media reflects, represents and influences the contemporary world and identify avenues for a career in print and electronic media.

Course Content

1. **Introduction to Mass Communication**

1. 1Mass Communication and Globalization

2. **Forms of Mass Communication**

Topics for Student Presentations:

a. Case studies on current issues Indian journalism

b. Performing street plays

c. Writing pamphlets and posters, etc.

3. **Advertisement**

1. Types of advertisements

2. Advertising ethics

3. How to create advertisements/storyboards

Topics for Student Presentations: a. Creating an advertisement/visualization b. Enacting an advertisement in a group c. Creating jingles and taglines

4. Media Writing

1. Scriptwriting for TV and Radio

2. Writing News Reports and Editorials

3. Editing for Print and Online Media

Topics for Student Presentations:

a. Script writing for a TV news/panel discussion/radio programme/hosting radio programmes on community radio

b. Writing news reports/book reviews/film reviews/TV program reviews/interviews

c. Editing articles

d. Writing an editorial on a topical subject

5. Introduction to Cyber Media and Social Media

1. Types of Social Media

2. The Impact of Social Media

3. Introduction to Cyber Media

Suggested Readings

Bel, B. et al. Media and Mediation. New Delhi: Sage, 2005.

Bernet, John R, Mass Communication, an Introduction. New Jersey: Prantice Hall, 1989.

Stanley J. Baran and Davis, Mass Communication Theory: Foundations, Ferment and Future. Boston: Wadsworth Cengage Learning, 2012.

John Fiske, Introduction to Communication Studies. London: Routledge, 1982.

Katherine Miller, Communication theories: Perspectives, Processes and Contexts. New York: McGraw Hill, 2004.

Michael Ruffner and Michael Burgoon, Interpersonal Communication. New York & London: Holt, Rinehart and Winston1981.

Kevin Williams, Understanding Media Theory. London & New York: Bloomsbury, 2015.

V.S. Gupta, Communication and Development. New Delhi: Concept Publication, 2000.

Paper -4

Ability Enhancement Compulsory Course

Environment Studies

Course Credits: 4

Learning Outcomes

- Articulate the interconnected and interdisciplinary nature of environmental studies
- Students will develop an understanding of environmental issues
- Students will reflect on their roles ,responsibilities and identities as citizens, consumers and environmental actors in a complex, interconnected world.

Unit 1 : Study of Environment and Ecology

1.1 Introduction to environmental studies

• Multidisciplinary nature of environmental studies;

• Scope and importance; Concept of sustainability and sustainable development.

1.2 Ecology and Ecosystems

- Introduction to Ecology
- What is an ecosystem?

Structure and function of ecosystem;

Energy flow in an ecosystem: food chains, food webs and ecological succession.

Case studies of the following ecosystems :

a) Forest ecosystem b) Grassland ecosystem c) Desert ecosystem d) Aquatic ecosystems (ponds, streams, lakes, rivers, oceans, estuaries)

Unit 2 : Natural Resources : Renewable and Non-renewable Resources

• Land resources and landuse change; Land degradation, soil erosion and desertification.

• Deforestation: Causes and impacts due to mining, dam building on environment, forests, biodiversity and tribal populations.

• Water : Use and over-exploitation of surface and ground water, floods, droughts, conflicts over water (international & inter-state).

• Energy resources : Renewable and non renewable energy sources, use of alternate energy sources, growing energy needs, case studies. (8 lectures)

Unit- 3. Biodiversity and Conservation

• Levels of biological diversity : genetic, species and ecosystem diversity;

Biogeographic zones of India; Biodiversity patterns and global biodiversity hot spots

• India as a mega-biodiversity nation; Endangered and endemic species of India

• Threats to biodiversity : Habitat loss, poaching of wildlife, man-wildlife conflicts, biological invasions; Conservation of biodiversity : In-situ and Ex-situ conservation of biodiversity.

• Ecosystem and biodiversity services: Ecological, economic, social, ethical, aesthetic and Informational value.

Unit 4 : Environmental Pollution, Policies and Practices

4.1 Environmental Pollution

• Environmental pollution : types, causes, effects and controls; Air, water, soil and noise pollution • Nuclear hazards and human health risks

• Solid waste management : Control measures of urban and industrial waste.

• Pollution case studies

4.2 Environmental Policies & Practices

• Climate change, global warming, ozone layer depletion, acid rain and impacts on human communities and agriculture 2/2

• Environment Laws: Environment Protection Act; Air (Prevention & Control of Pollution) Act; Water (Prevention and control of Pollution) Act; Wildlife Protection Act; Forest Conservation Act. International agreements: Montreal and Kyoto protocols and Convention on Biological Diversity (CBD).

• Nature reserves, tribal populations and rights, and human wildlife conflicts in Indian context.

Unit 5 : Human Communities and the Environment

• Human population growth: Impacts on environment, human health and welfare.

• Resettlement and rehabilitation of project affected persons; case studies.

• Disaster management : floods, earthquake, cyclones and landslides.

• Environmental movements : Chipko, Silent valley, Bishnois of Rajasthan.

• Environmental ethics: Role of Indian and other religions and cultures in environmental conservation.

• Environmental communication and public awareness, case studies (e.g., CNG vehicles in Delhi).

Unit 6 : Field work

• Visit to an area to document environmental assets: river/ forest/ flora/fauna, etc.

• Visit to a local polluted site-Urban/Rural/Industrial/Agricultural.

• Study of common plants, insects, birds and basic principles of identification.

• Study of simple ecosystems-pond, river, Delhi Ridge, etc.

Suggested Readings:

1. Carson, R. 2002. Silent Spring. Houghton Mifflin Harcourt.

2. Gadgil, M., & Guha, R. 1993. This Fissured Land: An Ecological History of India. Univ. of California Press.

3. Gleeson, B. and Low, N. (eds.) 1999. Global Ethics and Environment, London, Routledge.

4. Gleick, P. H. 1993. Water in Crisis. Pacific Institute for Studies in Dev., Environment & Security. Stockholm Env. Institute, Oxford Univ. Press.

5. Groom, Martha J., Gary K. Meffe, and Carl Ronald Carroll. Principles of Conservation Biology. Sunderland: Sinauer Associates, 2006.

6. Grumbine, R. Edward, and Pandit, M.K. 2013. Threats from India's Himalaya dams. Science, 339: 36-37.

7. McCully, P. 1996. Rivers no more: the environmental effects of dams (pp. 29-64). Zed Books.

8. McNeill, John R. 2000. Something New Under the Sun: An Environmental History of the Twentieth Century.

9. Odum, E.P., Odum, H.T. & Andrews, J. 1971. Fundamentals of Ecology. Philadelphia: Saunders.

10. Pepper, I.L., Gerba, C.P. & Brusseau, M.L. 2011. Environmental and Pollution Science. Academic Press.

11. Rao, M.N. & Datta, A.K. 1987. Waste Water Treatment. Oxford and IBH Publishing Co. Pvt. Ltd.

12. Raven, P.H., Hassenzahl, D.M. & Berg, L.R. 2012. Environment. 8th edition. John Wiley & Sons.

13. Rosencranz, A., Divan, S., & Noble, M. L. 2001. Environmental law and policy in India. Tripathi 1992.

14. Sengupta, R. 2003. Ecology and economics: An approach to sustainable development. OUP.

15. Singh, J.S., Singh, S.P. and Gupta, S.R. 2014. Ecology, Environmental Science and Conservation. S. Chand Publishing, New Delhi.

16. Sodhi, N.S., Gibson, L. & Raven, P.H. (eds). 2013. Conservation Biology: Voices from the Tropics. John Wiley & Sons.

17. Thapar, V. 1998. Land of the Tiger: A Natural History of the Indian Subcontinent.

18. Warren, C. E. 1971. Biology and Water Pollution Control. WB Saunders.

19. Wilson, E. O. 2006. The Creation: An appeal to save life on earth. New York: Norton.

20. World Commission on Environment and Development. 1987. Our Common Future. Oxford University Press

Centre for Biotechnology Studies
A.P.S. University Rewa (M.P.)

B.Sc. (Hons.) Biotechnology

Name of Semester	Paper code	Subject
First Semester	BT101 BT102 BT103 BT104	Botany I (Lower plants) Zoology I (Invertebrates) Basics of Inorganic and Physical Chemistry Cell Biology
Second Semester	BT201 BT202 BT203 BT204	Botany II (Higher Plants) Zoology II (Vertebrates) Basics of Organic Chemistry Genetics & Molecular Biology
Third Semester	BT301 BT302 BT303 BT304	Computer Application Fundamentals of Biochemistry Principle of Microbiology Biostatistics
Forth Semester	BT401 BT402 BT403 BT404	Biophysical and Molecular techniques Immunology Human physiology & Developmental Biology Entrepreneurship and IPR
Fifth Semester	BT501 BT502 BT503 BT504	Recombinant DNA Technology Animal Biotechnology and Cell culture Bioenergetics and Metabolism Environmental Studies.
Sixth Semester	BT601 BT602 BT603 BT604	Plant Biotechnology and tissue culture Medical biotechnology and Bioinformatics Environmental Biotechnology Industrial Biotechnology

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First Semester

Scheme of Marks

Paper Code	**Paper Name**	**External Assessment**		**Internal Assessment**		**Practical's Marks**		**Total**
		Max.	**Min.**	**Max.**	**Min.**	**Max.**	**Min.**	**Max. Marks.**
BT101	**Botany I (Lower Plants)**	35	13	15	06			50
BT102	**Zoology I (Invertebrates)**	35	13	15	06			50
BT103	**Basics of Inorganic and Physical Chemistry**	35	13	15	06			50
BT104	**Cell Biology**	35	13	15	06			50
	Practical –I (Based on Paper I and II)					50	18	50
	Practical –II (Based on Paper III and IV)					50	18	50
Total								**300**

Note: Internal assessment marks will be based on written test of concerned subject.

B.Sc. Biotechnology (Hon's)

Semester-I

Paper-1st (BT-101)

Botany I (Lower Plants)

Unit-1

Algae: General characters: General account on : habitat and habit , algal cell structure, algal pigments, flagella and food reserves. Types of the life cycle and Classification. Introduction to cyanobacteria, occurrence, salient features, thallus organization and reproduction in Nostoc.

Unit-2

Habitat, structure, reproduction and life cycle of following forms: Chlorophyta - *Volvox, , Chara.*
Xanthophyta**:** Occurrence, salient features, thallus organization and reproduction in *Vaucheria.*
Bacillariophyta: Occurrence, salient features, thallus organization and reproduction of pennate and centric diatoms.
Phaeophyta: Occurrence, salient features, thallus organization and reproduction with reference to *Ectocarpus.*
Rhodophyta: Occurrence, salient features, thallus organization and reproduction in *Polysiphonia*
Economic importance of algae.

Unit-3

Fungi: General characters, classification, Important Features, structure and mode of reproduction in fungi, and life history of Mastigomycotina- *Phytophthora*, Zygomycotiana *Mucor*, Ascomycotina :*Aspergillus, Peziza*,l Basibiomycotina - *Puccinia,* Alternaria, Agaricus Deurteromycotina *Cercospora*.
Lichens: Classification, occurrence, systematic position, mode of nutrition, reproduction and economic importance.

Unit-4

General characters and classification of Bryophyta
Hepaticopsida: *Marchantia*
Anthoceropsida: *Anthoceros*
Bryopsida: *Polytricum*

Unit-5

Pteridophyta: Important Characteristics and Classification
Psilophytopsida: *Rhynia*
Lycopsida: *Lycopodium*
Sphenopsida: *Equisetum*

B.Sc. Biotechnology (Hon's)

Semester-I

Paper-2nd (BT-102)

Zoology-I (Invertebrates)

Unit-1

Elementary Knowledge of Zoological Nomenclature and International Code.

Classification of Lower Invertebrates (According to Parker and Haswell 7th edition)

Classification of Higher Invertebrates (According to Parker and Haswell 7th edition)

Protozoa- Type, Study of Plasmodium, Protozoa and Diseases.

Unit-2

Porifera- Type study of Sycon.

Types of Canal system.

Coelenterata- Type study of Obelia

Corals and Coral Reef formation.

Unit-3

Helminthes- Type study of Liver Fluke.

Nematodes and diseases.

Annelida- Type study of earthworm , metamerism.

Type Study of Hirudinaria.

Structure and significance of Trochophore larva.

Unit-4

Arthropoda- Type study of Prawn.

Types study of Periplanata.

Larval forms of Crustacea.

Insect as Vectors of human diseases.

Unit-5

Mollusca- Type study of Pila

Echinodermata- External features and water vascular system of Star fish.

Larval forms of Echinoderms.

Minor Phyla – Ectoprocta & Rotifera.

B.Sc. Biotechnology (Hon's)

Semester-I

Paper- 3rd (BT-103)

Basics of Inorganic and Physical Chemistry

Unit-1

Atomic Structure: Idea of de Broglie matter wave, Heisenberg uncertainty principle, atomic orbital's, Quantum numbers, shapes of s, p, d orbitals, Trends in periodic table and applications in predicting and explaining the physical and chemical behaviors. Atomic radii, ionic radii, ionization energy, electron affinity and electro negativity.

Unit-2

Chemical Bonding: Valence bond theory and its limitations ,directional characteristics of covalent bond, various types of hybridization and shapes of simple inorganic molecules and ions, Valence shell electron pair repulsion (VSEPR) theory, homonuclear and heteronuclear (CO and NO) diatomic molecules, Weak interactions, Hydrogen bonding, van der Waal forces.

Unit-3

s - Block elements: Comparative study, diagonal relationships, salient features of Hydrides, Solvation and complexation tendencies. **p- Block elements:** Comparative study of groups 13–17 elements, compounds like hydrides, oxides, halides of group 13-16, basic properties of halogens, inter halogens and polyhalides. **d- blocks elements**: First transition series -Properties of the elements of the first transition series, stability of their oxidation states, coordination number. Second and Third transition series – General characteristics, comparative treatments with their 3d-analogues in respect of ionic radii, oxidation state and magnetic property.

Unit-4

Thermodynamics- Principles, Kirchhoff's equation, calculation of w, q, ΔU, ΔH, The Hender-Hasselbatch equation, of thermodynamics, Enthalpy, Second law of thermodynamics, Entropy free energy, chemical equilibrium, law of mass sction, Le chatlier's principles.

Different States: Structural differences between - solids, liquids and gases. Intermolecular forces, Definition of space lattice, unit cell. Bragg's equation. crystal structure of NaCl, KCl and CsCl, Ideal and non ideal solutions, methods of expressing concentration of solutions, Acid-Base concept.

Unit-5

Chemical kinetics & its scope, Rate of reaction, factors influencing the rate of reactions, zero order, second order, pseudo order, half life & mean life, various theories of chemical kinetics, Arrhenious equation & catalysis.

Solution, ideal & non ideal solution, Different methods of concentration expression, raoult's law

B.Sc. Biotechnology (Hon's)

Semester-I

Paper-4th (BT-104)

Cell Biology

Unit-1

Introduction, Scope and Importance, History of Cytology. Prokaryotic cell, Eukaryotic cell (Plant and Animal Cell). Structure of cell wall.

Plasma membrane: structure and functions (simple diffusion, facilitated diffusion, active transport, endocytosis, pinocytosis, phagocytois, and exocytosis).

Unit-2

Structure and functions of mitochondria, chloroplast, Structure and functions of Endoplasmic reticulum, Endoplasmic reticulum targeting proteins, protein folding and processing in ER, Targeting of lysosomal protein. Structure and function of Golgi complex, Protein Glycosylation within the Golgi. Structure and functions of Ribosome. Lysosome and Inracellular digestion.

Unit-3

The nucleus and nucleolus. structure and classification of Chromosomes.

Chromosome structure and its types. Lampbrush and Polytene Chromosomes.

Cellular reproduction: Cell cycle- mitosis and meiosis.

Unit-4

Cell Motility and Shape I: Structure and function of microfilaments and Intermediate Filaments. Molecular Mechanisms of Cell-Cell Adhesions. Extracellular Matrix of animals, Cell signaling. Introduction and application of stem cells.

Unit-5

General introduction of Cancer, Apoptosis and necrosis.

Techniques in cell biology: chromosomal banding techniques. Principles and applications of light microscope and electron microscope (Scanning and transmission). Karyotyping and Idiogram.

Centre for Biotechnology Studies
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Second Semester

Scheme of Marks

Paper Code	**Paper Name**	**External Assessment**		**Internal Assessment**		**Practical Marks**		**Total**
		Max.	**Min.**	**Max.**	**Min.**	**Max.**	**Min.**	**Max. Marks.**
BT201	Botany II (Higher Plants)	35	13	15	06			50
BT202	Zoology II (Vertebrates)	35	13	15	06			50
BT203	Basics of Organic Chemistry	35	13	15	06			50
BT204	Genetics & Molecular Biology	35	13	15	06			50
	Practical –I (Based on Paper I and II)					50	18	50
	Practical –II (Based on Paper III and IV)					50	18	50
Total								**300**

Note: Internal assessment marks will be based on written test of concerned subject.

Semester-II

Paper 5th (BT-201)

Botany II (Higher Plants)

Unit-1

Gymnosperm: General characters and Classification of Gymnosperms. Heterospory and Origin of Seed Habit. Diversity of Gymnosperm: Geological Time Scale and Fossilization. Fossil Gymnosperms: *Lyginopteris* and *Lagenostoma. Morphology, Anatomy Reproduction and life cycle, of Cycas, Pinus and Ephedra.*

Unit-2

Angiosperms: - : Origin and Evolution of Angiosperms. Terminology for plant description in semi technical language: Principles and rules of Botanical Nomenclature, Herbarium and Botanical gardens; Classification of Angiosperms: Bentham and Hooker, Hutchinson, and Engler & Prantals Modern trends inTaxonomy.

Unit-3

Taxonomy: Diagnostic characteristics and Economic Importance of Families – Ranunculaceae, Brassicaceae, Malvaceae, Rutaceae, Fabaceae, Apiaceae, Asteraceae, Asclepiadaceae, Solanaceae, Lamiaceae, Euphorbiaceae, Liliaceae and Poaceae.

Unit-4

Plant Physiology: - Plant Water Relations: Properties of water, Importance of water in plant life, Diffusion, Osmosis & Osmotic relation to plant cell. Water Absorption, Ascent of Sap. Transpiration: Structure & Physiology of Stomata, Mechanism of Transpiration, Factors affecting the rate of transpiration.

Photosynthesis:- Chloroplast, Photosynthetic pigments, Red drop, Emerson' effect, Concept of two Photosystems, Light reaction, Dark reaction – Calvin cycle, Hatch & Slack cycle, CAM cycle, Factors affecting rate of photosynthesis & Photorespiration.

Unit-5

Embryology: Concept of flower as a modified shoot. Structure of Anther, Microsporogenesis and Male Gametophyte. Structure of Pistil, Ovules, Megasporogenesis and Development of Female Gametophyte (Embryo Sac) and its types. Pollination– Mechanism and Agencies of Pollination, Pollen Pistil interactions and Self incompatibility. Double Fertilization and triple fusion. Development and types of endosperm and its morphological nature, Development of Embryo in Monocot and Dicot. Fruit development and maturation. Seed structure and dispersal. Mode of Vegetative Propagation.

B.Sc. Biotechnology (Hon's)

Semester-II

Paper-6th (BT-202)
Zoology II (Vertebrates)

Unit-1

Origin of Chordates Classification of phylum Chordata upto orders according to Parker and Haswell (Latest edition).
Hemichordata – External features and affinities of Balanoglossus.
Urochordata – Type study of Herdmania.
Cephalochordata – Type study of Amphioxus. Affinities of Amphioxus.

Unit-2

Comparative account of limb bones and girdles of vertebrates (Amphibia, Reptiles, Birds and Mammals).
Comparative account of digestive system.
Comparative account of respiratory system.
Comparative account of aortic arches and heart.
Comparative account of brain
Placentation in mammals.

Unit-3

Origan of life- modern concepts only.
Lamarckism, Darwinism.
Modern synthetic theories: Variations, Mutation, Isolation & speciation
Adaptation and mimicry
Micro, macro evolution and mega evolution.

Unit-4

Aquaculture

Prawn culture: Culture of fresh water prawn , methods of prawn fishing ,preservation and processing of prawns.
Pearl culture and pear industry.
Major carp culture : Management of ponds , preservation and processing of fishes.
Maintenance of Aquarium.

Unit-5

Economic Entomology

Sericulture: Species of silkworm, life history of *Bombyx mori*, Sericulture Industry in India.
Apiculture – Life cycle of the species methods of bee keeping, products of bees, enemies of bees.
Lac culture: Lifecycle, and association with the host plant.
Biological control of insect pests.

B.Sc. Biotechnology (Hon's)

Semester-II

Paper-7th (BT-203)
Basics of Organic Chemistry

Unit-1

Structure of Organic compounds, bond length, bond angle, Hydrogen bond, Resonance, Electronic effects, inductive, Mesomeric, Electromeric & Hyperconjugation. Nucleophiles and Electrophiles, Reaction intermediates Carbonium ions, Carbanions, Free radicals and Carbenes, Homolytic fission and Heterolytic fission.

Unit-2

Introduction, Nomenclature, Isomerism, Preparation and General Properties of Aliphatic hydrocarbons, Alkanes, Alkenes and Alkynes, Cycloalkanes,

Unit-3

Introduction, Nomenclature, Preperation and general properties of Alcohols, Phenols, Aldehyde and Ketones. Aromaticity.

Unit-4

Carbohydrates(monosaccarides, diasaccarides and polysaccharides) : classification and general properties, Glucose and fructose (open chain and cyclic structure), Overview of primary, secondary, tertiary and Quaternary structure of proteins. Introduction, glycerides, synthetic detergents, Introduction, classification of amino acids

Unit-5

Stereochemistry: Simple molecules , Hybridization, conformation & configuration, Geometrical isomerism, optical isomerism, Chirality, Enantiomers and optical activity

B.Sc. Biotechnology (Hon's)

Semester-II

Paper-8th (BT-204)
Genetics & Molecular Biology

Unit-1

Importance of Genetics, Gene, allele, genotype and phenotype.
Mendelian laws of inheritance, Monohybrid cross, Law of Dominance and the law of segregation, Dihybrid cross and law of independent assortment.
Interactions of genes, complementary genes, reversions , lethal genes, epistasis.
Multiple alleles, Blood groups, Rh factor.

Unit-2

Sex linked inheritance**:** X linkage, sex linkage in man, color blindness, Hemophilia (Bleeder's disease) and other genetic diseases.
Characteristics of X linked inheritance.
Y linked inheritance in Man, Inheritance of X-Y linked genes.
Human genetics (pedigree analysis, karyotypes and genetic disorder).

Unit-3

Structure of prokaryotic and eukaryotic genomes.
Molecular basis of life. Nucleic acids as genetic material.
Structure of DNA and its alternative forms.
Structure and Types of RNA.
DNA replication in prokaryotes (enzymology and process)

Unit-4

Prokaryotic gene expression: Prokaryotic transcription.
Genetic code
Prokaryotic translation.
Regulation of gene expression: Operon concept (Lac and Trp operon)

Unit-5

DNA recombination: molecular mechanisms
Mutation (point mutation, frame shift mutation) chromosomal aberration and DNA repair.
Oncogenes and Tumor Suppressor Genes: Properties and Significance
Insertion elements and transposons.

Centre for Biotechnology Studies
A.P.S. University Rewa (M.P.)
B.Sc. (Hon's) Biotechnology,

Third Semester

Scheme of Marks

Paper Code	**Paper Name**	**External Assessment**		**Internal Assessment**		**Practical's Marks**		**Total**
		Max.	**Min.**	**Max.**	**Min.**	**Max.**	**Min.**	**Max. Marks.**
BT301	Computer Application	35	13	15	06			50
BT302	Fundamentals of Biochemistry	35	13	15	06			50
BT303	Principle of Microbiology	35	13	15	06			50
BT304	Biostatistics	35	13	15	06			50
	Practical –I (Based on Paper I and II)					50	18	50
	Practical –II (Based on Paper III and IV)					50	18	50
Total								**300**

Note: Internal assessment marks will be based on written test of concerned subject.

B.Sc. Biotechnology (Hon's)

Semester-III

Paper-9th (BT-301)
Computer Application

Unit I

Introduction to computer: History and Generation of computer, Characteristic to computer, Classification: digital, analogue, hybrid, Micro, mini and Super, Components of computer System.

Unit II

Introduction to Operating system: Need, functions, control programs, OS supervisor, Job control programs concurrent, C. S., popular OS for PC's. Introductions to DOS, Internal commands, External commands, (TREE, UNDELTE, CHKDSK, FDISK, FC, BACKUP, RESORE, FORMAT, UNFORMAT, JOIN, XCOPY)

Unit III

Introduction to windows: Program manager, file manager, customizing windows with control panel, print manager. File shearing. Computer languages.

Unit IV

Introduction to MS office: The office manager, Starting information with MS office, The clipboard, Word, Excel, Power point. Word processing with word; word basis, Undo, redo, repeat, Insert, text, replace Text, copying form one word document to other. Printing, auto formation, autocorrect.

Unit V

Internet- introduction and application: LAN, WAN, MAN, WWW, Search engines,WiFi,LiFi.

Semester-III

Paper-10th (BT-302)
Fundamentals of Biochemistry

UNIT-1

The foundation of biochemistry: Biochemical organization of Cell, Intra and inter molecular forces electrostatic interactions and Hydrogen bonding interaction, vander Waals and Hydrophobic interactions, Disulphide bridges, Role of water and weak interactions, Chemical foundations of Biology- pH, pK, acids, bases, buffers, weak bonds & Covalent bonds.

UNIT-2

1. Carbohydrates: classification, structure, functions; homo and hetero polysaccharides,animal, plant and microbe specific polysaccharides.

2. Lipids: Classification, nomenclature, structure and property of fatty acids,Simple lipids- Triglisrids, fates and Waxes. Compound lipids- classification, structure, distribution, and biological importance, role of prostaglandine,leukotrins and thromboxans, Sterols- Cholestrol, role in biological system. Tarpenes and phenols.

UNIT -3

1. Nucleic acids: Structure, Properties of purines and pyrimidine bases,DNA : Structure, conformation, prokaryotic and eukaryotic DNA, nucleotides,Chromosomal and extrachromosomal DNA

2. RNA: Structure, types and function of mRNA, tRNA, Ribozymes: structure and functions.

UNIT-4

3. Amino acids- classification, structure, property, Zwitter ion, titration curve and biologically important amino acids

5. Proteins: Classification, Primary structure, nature of peptide bond, secondary structure, hydrogen bonding, salt bridge, disulphide bonds, hydrophobic and hydrophilic interaction in proteine and role of these bonds in protein folding, α-helix, β- sheet, and beta turns structures etc.Tertiary and quaternary structure. Biological role of proteins.

UNIT-5

Enzymes; General characteristics and Catalytic power of enzymes and their classification, Energy considerations, Factors affecting enzyme activity, Enzyme kinetics, Michaelis- Menten equation, Allosteric enzymes .Vitamins and cofactors: Structure, distribution, interaction and biological properties Hormones- structure, distribution and function.

B.Sc. Biotechnology (Hon's)

Semester-III

Paper-11th (BT-303)

Principles of Microbiology

UNIT I

Scope of Microbiology:

Historical aspect: Early observations of Antony Van Leeuwenhoek,
Control of Infections: Vaccination, Chemotherapy, Antibiotics.
Aseptic Techniques: Disinfection, sterilization, pasteurization.

UNIT II

Diversity of Micro organisms: Archaea, Prokaryota, Eukaryota [an overview of structure].
Brief introduction of Bacteria, Fungi, Protozoa, Algae [protistean] and Viruses. Viroids and Prions.
Kingdom Monera, Five kingdom system and its modifications. The Three Domains.
Bergey's manual of Systematic Bacteriology.

UNIT III

Identification of Bacteria: Culture and Isolation.
Methods of Pure culture of Microorganisms: Concept of Pure culture, Streak plate method, Pour plate method. Culture media.s
Staining of bacteria: Gram stain, Acid–fast stain, Endospore stain, Negative stain, flagella stain.
Estimation of Micro-organisms: Dilution plate technique, MPN method.

UNIT IV

Bacterial cell: External Structure; Flagella, Pili, Glyocalyx, Cell wall ,
Gram Positive and Gram negative bacteria,
Internal Structure: Cytoplasm, Nucleiod, Endospore. Structure of Archaea cell.

UNIT V

Microbial Growth.

Measurement of Growth: Turbidity, Dry weight measurement.
Physical factors affecting growth: Temperature, pH, Water activity.
Chemical factors affecting growth: carbon, Nitrogen, Sulphur, Phosphorus, Trace elements, Oxygen. Continuous and Batch culture.
Food Borne Infections: Food poisoning. Infective and toxic, Bacterial and non-bacterial. General methods of their diagnosis .Organisms from common food items such as curd and bread.

B.Sc. Biotechnology (Hon's)
Semester-III
Paper-12th (BT-304)

Biostatistics

UNIT – I

Collection of Data, Classification and Tabulation of Data : Graphical presentation, bar charts, Pie diagrams,Graphs, Measures of Central Tendency, Measures of Dispersion. Correlation and Regression.

UNIT – II

Statistical Population, Sample from Population, classical definition of probability, Probability Distribution, Binomial Poisson and Normal Distribution.

UNIT – III

Parameters and Statistics, Sampling Distribution, Theory of Error, Test of Significant, Mean and Standard deviation, chi-square test for goodness of fit, T-test, Analysis of Variance.

UNIT – IV

Multivariate, Analysis. Design of Experiments, randomization, replication, local control, complimentary, Randomized, randomized block design.

UNIT – V

Factor Analysis. Path analysis, Classification and Discriminant Analysis Tools: CART, Random forests, Fisher's discriminant functions. Neural networks. Multilayer perception,algorithm, exploratory data analysis.

Fourth Semester

Scheme of Marks

Paper Code	Paper Name	External Assessment Max.	External Assessment Min.	Internal Assessment Max.	Internal Assessment Min.	Practical's Marks Max.	Practical's Marks Min.	Total Max. Marks.
BT401	Biophysical and Molecular techniques	35	13	15	06			50
BT402	Immunology	35	13	15	06			50
BT403	Human physiology & Developmental Biology	35	13	15	06			50
BT404	Entrepreneurship and IPR	35	13	15	06			50
	Practical –I (Based on Paper I and II)					50	18	50
	Practical –II (Based on Paper III and IV)					50	18	50
Total								**300**

Note: Internal assessment marks will be based on written test of concerned subject.

B.Sc. Biotechnology (Hon's)
Semester-IV
Paper-13th (BT-401)

Biophysical and Molecular techniques

Unit-1

PH Metter, Buffer, Handerson and Hasselblach equation,
Titration of weak acid and weak bases.
Tracer Technique.

Unit-2

Spectroscopic Technique:Principle and its applications- UV, visible and Fluorescence spectroscopy,X-ray Diffraction, Nuclear Magnetic Resonance (NMR)

Unit-3

Chromatographic Technique: Principle and its Application, Types(Adsorption and Partition Chromatography). Paper, Thin layer, Ion-Exchange, HPLC.

Unit - 4

1Centrifugation Technique,
Electrophoresis of DNA, proteins and enzymes.
Southern, northern and western blotting

Unit-5

DNA Fingerprinting (VNTR)
PCR and its different variations.
DNA sequencing

B.Sc. Biotechnology (Hon's)
Semester-IV
Paper-14th (BT-402)
Immunology

UNIT I

Immunity and Immune response: Innate immune and characteristics of adaptive immune Responses, Hematopoiesis. Anatomical organization of Immune System: Primary Lymphoid Organs, Secondary Lymphoid Organs, Cell of immune system: Mononuclear cells and granulocyte, Antigen presenting cells, lymphocytes and their subsets.

UNIT II

Inflammation: its mediator and the process, cell-adhesion molecules and their role in

Inflammation, role of anaphylatoxins, granulocyte in inflammatory process.

Major histocompatibility systems:

UNIT III

Antigen: Properties, types and determinants of antigenicity, Heptanes: Factor affecting immunogenicity, Super antigen. Antibody: Nature, Types and Structure of Immunoglobulin and Their Functions. Antigen-Antibody interaction avidity and affinity.

UNIT IV

Monoclonal antibodies: production, characterization and application .

Compliment System, components, Activation pathway and regulation.

Hypersensitivity and its types.

UNIT V

Autoimmunity and Immunodeficiency Syndrome

Vaccines: Active and passive immunization.

Immunotechniques: Immunodifusion, Immunoprecipitation, ELISA, RIA.

B.Sc. Biotechnology (Hon's)
Semester-IV
Paper-15th (BT-403)
Human physiology & Developmental Biology

UNIT I

Introductory Knowledge of Different Organ System of Body, Structure and parts of Digestive tract, Physiology of digestion and disorders of digestive tract. Structure and parts of Respiratory system, Physiology of Respiration, disorders of Respiratory system, Anatomy and physiology of Heart, disorders of Circulatory system .

UNIT II

Structure and parts of Excretory system, structure of kidney, Physiology of Excretion disorders of Excretory system, Structure, parts and Physiology of Nervous system, disorders of Nervous system, Physiology of Muscle contraction.

UNIT III

Endocrine system : Introduction to Endocrinology, Structure and Hormones of pitutary gland, thyroid gland, parathyroid gland, adrenal gland, pancreas, gonads, thymus, gastro intestine, Regulation of endocrine system and Disorders of Endocrine system.

UNIT IV

Structure of male reproductive Organs, Structure of female reproductive organs, reproductive hormones, menstrual cycle, pregnancy and lactation, disorders of reproductive system, placentation.

UNIT V

Historical perspective, Aims and Scope of Developmental Biology, Gametogenesis – Spermetogenesis and Oogenesis, Fertilization, cleavage, Blastulation, Gastrulation, Fate map, Organizer Concept, Concept of Regeneration.

B.Sc. Biotechnology (Hon's)
Semester-IV
Paper-16th (BT-404)
Entrepreneurship and IPR

UNIT I

Entrepreneurship: Definition, characteristics, importance, types and functions of an entrepreneur, qualities of a good entrepreneur; entrepreneurial motivation factors.

UNIT II

Women entrepreneurship: Opportunities and problems, search and selection of business idea. Basics of production management: Methods of manufacturing-Project/Jobbing, Batch Production, Flow/Continuous production, process production-Characteristics of each Method.

UNIT III

Preparation of project report: Preparation of preliminary project report, main elements of a detailed project report, selection of types of organization and factors influencing the choice of organization, sole proprietorship, partnership, co-operative society.

UNIT IV

Public policy, regulatory and ethical challenges facing the biotechnology, Entrepreneurship, Business development for medical products, Business development for consumable products

UNIT V

Patenting System: WTO, Paris Convention, Indian Legislations, Intellectual Property Right: Copy Right & Industrial Properties, Trademarks, Designs, Geographical Indications, IPR & Technology transfer, Role of patentee & Licensor, Patent process & Patent laws & e-filing

Centre for Biotechnology Studies
A.P.S. University Rewa (M.P.)
B.Sc. (Hon's) Biotechnology,

Fifth Semester

Scheme of Marks

Paper Code	**Paper Name**	**External Assessment**		**Internal Assessment**		**Practical's Marks**		**Total**
		Max.	**Min.**	**Max.**	**Min.**	**Max.**	**Min.**	**Max. Marks.**
BT501	Recombinant DNA Technology	35	13	15	06			50
BT502	Animal Biotechnology and Cell culture	35	13	15	06			50
BT503	Bioenergetics and Metabolism	35	13	15	06			50
BT504	Environmental Studies.	35	13	15	06			50
	Practical –I (Based on Paper I and II)					50	18	50
	Practical –II (Based on Paper III and IV)					50	18	50
					Total			**300**

Note: Internal assessment marks will be based on written test of concerned subject.

B.Sc. Biotechnology (Hon's)
Semester-V
Paper-17th (BT-501)
Recombinant DNA Technology

Unit I

The recombinant DNA Technology: General concept and principle of cloning, Enzymes: Nucleases and restriction endonucleases- properties and types; phosphomonoesterases; polymerase; terminal deoxynucleotidyl transferase; poly A polymerase, Linkers, adaptors and homopolymer tailing. Prokaryotic host- vector system: Characteristics of E.coli as host; vectors for cloning in E.coli. (plasmid pBr322, pUC, bacteriophage- EMBL)

Unit II

Design and characteristics of expression vectors for cloning in prokaryotes and factors that affect expression. Cloning in Yeast: Properties of yeast as host for cloning and different types of vectors designed for cloning in yeast, Plant transformation technology: Features of Ti and Ri plasmids, mechanism of DNA transfer. Methods of introduction of foreign DNA in animal system; Vectors for cloning in animal system- SV-40,

Unit III

Methods for Constructing rDNA and cloning: Inserts; vector insert ligation; infection, transferring and cloning ,Methods for screening and selection of recombinant clones , DNA Libraries: types, advantages and disadvantages of different types of libraries; Different methods for constructing genomic and full length cDNA libraries.

Unit IV

Principles and applications of Blotting techniques- Southern, Northern, Western and Eastern blotting; Polymerase Chain reaction and types (multiplex, nested, RT, real time, touchdown PCR, hot start PCR, colony PCR). Blotting techniques (Southern, northern and western).

Unit V

DNA fingerprinting and DNA footprinting. restriction fragment length polymorphism.Application of Recombinant DNA technology in Medicine & Industry. Application of Recombinant DNA technology in Medicine & Industry. Si RNA and si RNA technology: Micro RNA Construction of si RNA vectors: Gene silencing and its applications in agro industry.

B.Sc. Biotechnology (Hon's)
Semester-V
Paper-18th (BT-502)
Animal Biotechnology and Cell culture

UNIT I

Animal cell and tissue culture: History and scope of animal biotechnology and genomics, advantage and Laboratory Facilities for Cell and Tissue Culture, Substrate, Culture Media and Procedures for Cell and Tissue Culture, Primary cell Culture and Cell Lines,

Stem Cells: Introduction, Origin, Types and functions of Stem Cells, Therapeutics, cloning for embryonic stem cells, Stem Cell Therapy.

UNIT II

Organ/Embryo Culture: Primary Tissue Explanation Techniques, Organ Culture, Embryo Culture.

Cell and Tissue engineering: Approaches and Bio-Materials for tissue engineering, Tissue engineering of skin (Skin Graft), Engineering of Bone Crafts and Artificial Nerve Crafts, Future Limitations and Possibilities of Tissue Engineering.

UNIT III

In Vitro Fertilization and Embryo Transfer: In Vitro Fertilization in Human, Embryo Transfer (ET) in Humans, Super Ovulation and Embryo Transfer in Farm Animals (e.g. Cow).

Cloning of Animals: Method, Types and utility of cloning animals, Cloning for Production of Transgenic Animals, Human Cloning and Ethical issues and Risk.

UNIT IV

Transgenic Animals: Gene Transfer or Transfection (Transfection of embryo, unfertilized eggs, culture of mammalian cells), Transgenic Animals, Cryopreservation.

UNIT V

Molecular Maps: Genetic Maps Using Molecular Markers, Cytogenetic Maps Using Molecular Markers, Physical Maps Using Molecular Markers.

Genomics and Proteomics: Human Genome project, Progressing Genomic Research (*Drosophila*, Mouse, Rat, Chimpanzee), Integrated Genomic Maps and Linkage Disequilibrium, Maps of the Future, Introduction types and application of proteomics.

B.Sc. Biotechnology (Hon's)
Semester-V
Paper-19th (BT-503)

Bioenergetics and Metabolism

Unit-1

Basic concept, laws of thermodynamics, ATP role in metabolism. Mechanism of Enzyme catalysis and action, Enzyme inhibition, activation of enzymes, Immobilized enzymes. Molecular mechanism of action of chymotrypsin, Lysozyme.

Unit-2

Glycolysis: Key structure and enzymatic reactions. Regulation of glycolysis. conversion of pyruvate into ethanol lactate or acetyl CoA. Gluconeogenesis:Enzymatic reaction and its role. Pentose phosphate pathway : enzymatic reaction.

Unit-3

Citric acid cycle: Enzymatic Reaction**.**

Electron transport and oxidative phosphorylation.

Unit-4

Carbohydrate Metabolism in plants: Photosynthesis, C_3, C_4 & CAM plants.

Lipid Metabolism: Enzymatic reaction.

Unit-5

Amino acid Metabolism: Enzymatic reaction.

Nucleotides metabolism: Enzymatic reaction.

B.Sc. Biotechnology (Hon's)
Semester-V
Paper-20th (BT-504)

Environmental Studies

Unit 1- The multidisciplinary nature of Environmental Studies, Definitions, scopes & importance, need for public awareness. Natural resources:, renewable & non renewable resources, natural resources & associated problems of forest, water, minerals, food, energy & land resources. Conservation of natural resources, Environmental Ethics:, issues & possible solutions, water conservation, rain water harvesting & watershed management, resettlements & rehabilitation of peoples.

Unit 2- Ecosystems; Concept of an ecosystem, structure & function of an ecosystem, energy flow in the ecosystem, ecological succession, food chain, food webs & ecological pyramids. Types, characteristic features, structure & function of following ecosystem; forest ecosystem, grassland ecosystem, desert ecosystem, aquatic ecosystem (ponds, streams, lakes, rivers, oceans, estuaries etc.)

Unit 3- Concepts of Biodiversity**:** Definition of Genetic species & ecosystem diversity, biogeographical classification of india- value of diversity: consumptive use, productive use, social, ethical, Aesthetic & option values. Biodiversity at global, national & local levels. Hotspot of diversity, threats to biodiversity: habitat loss, poaching of wild life, man wild life conflicts. Endangered & endemic species of india, conservation of biodiversity.

Unit 4- Definition of environmental pollution, causes, effects, & control measures of air, water, soil, marines, thermal & noise pollution. Climate Change: global warming, acid rain, ozone layer depletion & nuclear accidents. Solid Waste management: causes, effect & control measures of urban & industrial wastes. Role of an individual in prevention of pollution.

Unit 5- Disaster managements: Floods, earthquakes, cyclones, & landslides. Waste lands reclamation, Consumerism & waste product. Population explosion: family welfare programmes, environment & human health, HIV/AIDS: Role of information technology in environmental & human health. Environmental legislation: environment protection act. Air(prevention & control of pollution) Act. Water (prevention & control of pollution) Act. Wild life protection Act. Forest conservation Act.

Centre for Biotechnology Studies
A.P.S. University Rewa (M.P.)
B.Sc. (Hon's) Biotechnology,

Sixth Semester

Scheme of Marks

Paper Code	Paper Name	External Assessment		Internal Assessment		Practical Marks		Total Max. Marks.
		Max.	Min.	Max.	Min.	Max.	Min.	
BT601	Plant Biotechnology and tissue culture	35	13	15	06			50
BT602	Medical biotechnology and Bioinformatics	35	13	15	06			50
BT603	Environmental Biotechnology	35	13	15	06			50
BT604	Industrial Biotechnology	35	13	15	06			50
	Practical –I (Based on Paper I and II)					50	18	50
	Practical –II (Based on Paper III and IV)					50	18	50
Total								**300**

Note: Internal assessment marks will be based on written test of concerned subject.

B.Sc. Biotechnology (Hon's)
Semester-VI
Paper-21th (BT-601)

Plant Biotechnology and Tissue Culture

UNIT I

Plant Tissue Culture: Basic aspects of plant biotechnology (History, application, scope and importance), laboratory and culture media for plant tissue culture, cell Culture and its applications.

Clonal Propagation and Protoplast Culture: Micro propagation, Somaclonal Variation, Production and uses of Haploids**,** Protoplast isolation, Regeneration of plant, Somatic Hybridization

UNIT II

Gene Transfer in Plants: Vectors of gene transfer (Plasmids, Agrobacterium and Virus vector) Transformation technique (Agrobacterium mediated gene transfer, DNA mediated gene transfer (DMGT) Removal of selected Marker Genes from Transgenic Plants, Regulatory sequences of induced genes.

Transgenic Plant resistance against Stress: Development of herbicide resistant transgenic plant, Development of insect resistant transgenic plant, Transgenic plant resistance against virus, bacterial and fungal pathogens, transgenic plant resistance against abiotic stress.

UNIT III

Genetically Modified Crops and Floricultural Plants: Transgenic plants with improved crop productivity, Transgenic plants with improved nutritional quality, Transgenic plants for Floriculture.

Molecular Farming:

Transgenic Plants for Value Added Specialty Crops, Transgenic Plants for Edible Vaccines, Transgenic Plants for Antibodies and Transgenic Plants for Biopharmaceuticals

UNIT IV

Transgenic Plants for Biosafety: Biosafety regulations of Transgenic Crops, Commercialization of Transgenic plants, quality modifications of plants (Modification of starch quality, modification and future of oil quality and modification of seed protein quality).

Choloroplast Engineering: plants Engineering of Chloroplast Genome, Transformation of choloroplast genome in higher plants, Transplastomic Plants and its applications (in Tabacco, Patato, Rice, Tomato etc.)

UNIT V

Construction of Molecular Maps: Preparation of Genetic Maps, (cereals, millets, sugarcane, cotton, Soyabean, Pea, Sunflower, etc.), Molecular genetics maps of high density plants, Uses of molecular genetics maps.

Genomics: Microcllinearity in DNA Sequences of Small Genomic Regions, Thale cress genome, Rice (Oryza Sativa)

Semester-VI
Paper-22th (BT-602)
Medical Biotechnology and Bioinformatics

UNIT I

Biotechnology in medicine: History, scope & importance of Biotechnology in medicine Disease Diagnosis (DNA, RNA probes, Monoclonal Antibodies auto Antibodies), Detection and Treatment of genetic Diseases.

Genetic Counseling and Forensic Medicine: Fertility control, Genetic counseling, (Chance of having child with congenital defects, choice of Baby sex), DNA Fingerprinting in Forensic Medicines.

UNIT 1I

Gene therapy: Definition and types of Gene therapy, Initial success and future of Gene therapy, Vectors and other delivery system of gene therapy, Target tissue for gene therapy system, Gene therapy of genetic diseases(Neurological Disorders, Cystic Fibrosis),Gene therapy of Acquire diseases(Infectious Diseases, Cardiovascular diseases, cancer), Nanobiotechnology for drug targeting and gene therapy.

UNIT III

Pharmaceutical Biotechnology: Drug development, drug manufacturing processes, manufacturing processes of antiviral drugs, drug designing, Novel drug delivery systems, Antimicrobial drugs.

Pharmacogenetics: Pharmacogenetics and personalized medicine, genetics and genomics in medical practice, use of SNPs in pharmocogenomics.

UNIT IV

Genetic Engineering: Genetic and recombinant vaccines; Edible vaccines production of therapeutic proteins; Genetic engineering for production of Factor VIII, tissue plasminogen activator, Interferon.

Tissue Engineering: Tissue engineering of skin and cartilage and their applications, properties and types of stem cells, culture and applications of stem cells, Transplant rejection, Intellectual property issues in using human embryonic stem cells.

UNIT V

Biological Database : Introduction, History and applications of Bio-Informatics, Sequences and Nomenclature (DNA sequences, Amino acid sequences of proteins, Types of sequences in nucleotide sequence database), Database and search tool (FASTA, BLASTA Nucleotide sequence database, protein database), GCG: The Wisconsin pacakage of sequence analysis programe, Detection of genes, Protein structure prediction, Large scale Bio-informatics genome projects.

B.Sc. Biotechnology (Hon's)
Semester-VI

Paper-23th (BT-603)

Environmental Biotechnology

UNIT I

Basic concepts of Environment: Basic concept of Environment & its component (Origin of earth, atmosphere, life & ecosystem), Scope & importance of environmental biotechnology.

Global Environmental Problems: Ozone depletion, UV- B, Green House Effect, Acid Rain, Climate change

UNIT II

Environmental Monitoring: Methods for sampling & measurement of air pollution, methods for sampling & measurement of water pollution, methods for sampling & measurement of soil pollution, permissible limits & indices for pollution.

Environmental Pollution & Control: sources, effects & control of air pollution, noise pollution, thermal pollution, water pollution, soil & solid waste pollution.

UNIT III

Bioremediation: Bio-remediation of inorganic & organic pollutants, bioremediation of xenobiotics, phytoremediation.

Solid & liquid waste Treatment: Microbial treatment of solid waste, liquid waste (Example sewage) waste water treatment, biotechnology for enhanced oil recovery.

UNIT IV

Clean Technology: Integrated pest management, biopolymer production & bioplastic technology, biotechnology for energy (production of biofule, biogas, microbial hydrogen).

Bio-fertilizers: vermin compost, green manure, use of microbes for improving soil fertility.

UNIT V

Restoration Technology: Reforestation through micro-propagation, Soil restoration, Lake Restoration, Biodiversity conservation.

Biosensor and Bio-reporter Technology: Principle types and application of biosensor, bio-reporter (Reporter Gene System).

B.Sc. Biotechnology (Hon's)
Semester-VI
Paper-24th (BT-604)

Industrial Biotechnology

UNIT I

Isolation and Culture of microorganisms: History, scope and importance of industrial biotechnology, isolation, screening, culture and preservation of microorganism, strain improvement.

Fermentation Technology: Bioreactor design, and operation types of fermenters, Fermentation media, Batch. Fed batch, continuous culture system, *Insitu* recovery of products.

UNIT II

Alcohol and acid Production: Industrial production of alcoholic beverages vinegar, Ethanol, organic acids, Amino acids and Antibiotics.

Enzyme Production: Properties and types of enzymes, Enzymes production, types and application, immobilization of Enzymes, Enzyme/protein Engineering, industrial processing: (Down stream processing, recovery, extraction and purification of fermentation products).

UNIT III

Dairy Industry: Fermented foods cheese production, use of enzymes in food industry, processing of milk and dairy products (Pasteurized milk, sterilized milk, cream and butter), enzymes in fruit juice and brewing industries (Fruit Juice and Wines, Beer), single cell protein.

Polymer and colloid production: Microbial and algal polysaccharides and polyesters production, (Production of Hydrocolloids and polyhdroxyalkonoides) Mass culture technique for algae, primary and secondary metabolites of microorganism and plants.

UNIT IV

Drug Discovery and Designing: History and molecular aspects of drug discovery, drug discovery in cancer, microbial genomics for new antibiotics, drug designing.

Metabolic engineering: Cloning and expression of heterologous genes, molecular breeding of Bio synthetic pathways, metabolomics and metabolic engineering, limitations in metabolic engineering.

UNIT V

Fuel biotechnology: Concept scope and importance of bio-fuels, bio-ethanol, bio-diesel, bio-hydrogen and biogas. **Bio-pesticides:** Microbial insecticides (Types Production and uses) Bio-pesticides (Types production and uses) principles and objectives of integrated nutrient management, biofertilizer

Centre for Microbiology Studies
A.P.S. University Rewa (M.P.)

B.Sc. (Hons.) Microbiology

Name of Semester	Paper code	Subject
First Semester	MB101 MB102 MB103 MB104	Botany I (Lower plants) Zoology I (Invertebrates) Basics of Inorganic and Physical Chemistry Basics of Microbiology & Bacteriology
Second Semester	MB201 MB202 MB203 MB204	Botany II (Higher Plants) Zoology II (Vertebrates) Basics of Organic Chemistry Cell Biology
Third Semester	MB301 MB302 MB303 MB304	Computer Application Fundamentals of Biochemistry Microbial Genetics and Molecular Biology Biostatistics
Fourth Semester	MB401 MB402 MB403 MB404	Biophysical and Molecular techniques Virology Microbial Physiology & Metabolism Entrepreneurship and IPR
Fifth Semester	MB501 MB502 MB503 MB504	Recombinant DNA Technology Mycology & Plant pathology Immunology Environmental Studies.
Sixth Semester	MB601 MB602 MB603 MB604	Medical Microbiology Food & Dairy Microbiology Microbial Ecology Industrial Microbiology

Centre for Microbiology Studies
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B.Sc. (Hons.) Microbiology

First Semester

Scheme of Marks

Paper Code	Paper Name	External Assessment Max.	External Assessment Min.	Internal Assessment Max.	Internal Assessment Min.	Practical's Marks Max.	Practical's Marks Min.	Total Max. Marks.
MB101	**Botany I (Lower Plants)**	35	13	15	06			50
MB102	**Zoology I (Invertebrates)**	35	13	15	06			50
MB103	**Basics of Inorganic and Physical Chemistry**	35	13	15	06			50
MB104	**Basics of Microbiology & Bacteriology**	35	13	15	06			50
	Practical –I (Based on Paper I and II)					50	18	50
	Practical –II (Based on Paper III and IV)					50	18	50
		Total						**300**

Note: Internal assessment marks will be based on written test of concerned subject.

B.Sc. Microbiology (Hon's)

Semester-I

Paper-1st (MB-101)

Botany I (Lower Plants)

Unit-1

Algae: General characters **:** General account on : habitat and habit , algal cell structure, algal pigments, flagella and food reserves. Types of the life cycle and Classification. Introduction to cyanobacteria , occurrence, salient features, thallus organization and reproduction in Nostoc.

Unit-2

Habitat, structure, reproduction and life cycle of following forms: Chlorophyta - *Volvox, , Chara.*

Xanthophyta**:** Occurrence, salient features, thallus organization and reproduction in *Vaucheria.*

Bacillariophyta: Occurrence, salient features, thallus organization and reproduction of pennate and centric diatoms.

Phaeophyta: Occurrence, salient features, thallus organization and reproduction with reference to *Ectocarpus.*

Rhodophyta: Occurrence, salient features, thallus organization and reproduction in *Polysiphonia*

Economic importance of algae.

Unit-3

Fungi: General characters, classification, Important Features, structure and mode of reproduction in fungi, and life history of Mastigomycotina- *Phytophthora*, Zygomycotiana *Mucor*, Ascomycotina :*Aspergillus, Peziza*,l Basibiomycotina - *Puccinia,* Alternaria, Agaricus Deurteromycotina *Cercospora*.

Lichens: Classification, occurrence, systematic position, mode of nutrition, reproduction and economic importance.

Unit-4

General characters and classification of Bryophyta

Hepaticopsida : *Marchantia*

Anthoceropsida : *Anthoceros*

Bryopsida : *Polytricum*

Unit-5

Pteridophyta : Important Characteristics and Classification

Psilophytopsida : *Rhynia*

Lycopsida : *Lycopodium*

Sphenopsida : *Equisetum*

B.Sc. Microbiology (Hon's)

Semester-I

Paper-2nd (MB-102)

Zoology I (Invertebrates)

Unit-1

1. Elementary Knowledge of Zoological Nomenclature and International Code.
2. Classification of Lower Invertebrates (According to Parker and Haswell 7th edition)
3. Classification of Higher Invertebrates (According to Parker and Haswell 7th edition)
4. Protozoa- Type Study of Plasmodium.
5. Protozoa and Diseases.

Unit-2

1. Porifera- Type study of Sycon.
2. Types of Canal system.
3. Coelenterata- Type study of Obelia
4. Corals and Coral Reef formation.

Unit-3

1. Helminthes- Type study of Liver Fluke.
2. Nematodes and diseases.
3. Annelida- Type study of earthworm , metamerism.
4. Type Study of Hirudinaria.
5. Structure and significance of Trochophore larva.

Unit-4

1. Arthropoda- Type study of Prawn.
2. Types study of Periplanata.
3. Larval forms of Crustacea.
4. Insect as Vectors of human diseases.

Unit-5

1.Mollusca- Type study of Pila
2. Echinodermata- External features and water vascular system of Star fish.
3. Larval forms of Echinoderms.
4. Minor Phyla – Ectoprocta & Rotifera.

B.Sc. Microbiology (Hon's)

Semester-I

Paper-3rd (MB-103)

Basics of Inorganic and Physical Chemistry

Unit-1

Atomic Structure: Idea of de Broglie matter wave, Heisenberg uncertainty principle, atomic orbitals, Quantum numbers, shapes of s, p, d orbitals, Trends in periodic table and applications in predicting and explaining the physical and chemical behaviors. Atomic radii, ionic radii, ionization energy, electron affinity and electro negativity.

Unit-2

Chemical Bonding: Valence bond theory and its limitations ,directional characteristics of covalent bond, various types of hybridization and shapes of simple inorganic molecules and ions, Valence shell electron pair repulsion (VSEPR) theory to NH3 , H3O+,SF4, and H2O MO theory, homonuclear and heteronuclear (CO and NO) diatomic molecules, Weak interactions, Hydrogen bonding, van der Waal forces.

Unit-3

Different States: Structural differences between - solids, liquids and gases. Intermolecular forces, Definition of space lattice, unit cell. Bragg's equation. crystal structure of NaCl, KCl and CsCl, Ideal and non ideal solutions, methods of expressing concentration of solutions, Acid-Base concept. **s - Block elements**: Comparative study, diagonal relationships, salient features of Hydrides, Solvation and complexation tendencies. **p- Block elements:** Comparative study of groups 13–17 elements, compounds like hydrides, oxides, halides of group 13-16, basic properties of halogens, inter halogens and polyhalides. **Chemistry of d- blocks elements**: First transition series -Properties of the elements of the first transition series, stability of their oxidation states, coordination number. Second and Third transition series – General characteristics, comparative treatments with their 3d-analogues in respect of ionic radii, oxidation state and magnetic property.

Unit-4

Thermodynamics- Principles, The Hender-Hasselbatch equation, of thermodynamics, Enthalpy, Second law of thermodynamics, Entropy free energy, chemical equilibrium, law of mass sction, principle

Unit-5

Law of Thermodynamics, Concept of Entropy and enthalpy, Kirchhoff's equation, calculation of w, q, ΔU, ΔH. Chemical kinetics & its scope, Rate of reaction, factors influencing the rate of reactions, zero order, second order, pseudo order, half life & mean life, various theories of chemical kinetics, Arrhenious equation & catalysis.

B.Sc. Microbiology (Hon's)

Semester-I

Paper- 4th (MB-104)
Basics of Microbiology & Bacteriology

Unit-1

History and Scope of Microbiology:

Classification: Binomial Nomenclature, Whittaker's five kingdom and Carl Woese's three domain classification systems and their utility,

Acellular (Prions, Viroids, Viruses) and cellular microorganisms.

Unit-II

Bacteria: General characteristics with emphasis on their morphology and cell structure.

Fungi: General characteristics of fungi with emphasis on their occurrence, distribution and structure.

Algae: General characteristics of algae with emphasis on their occurrence, distribution and cell structure.

Viruses: General characteristics and structure of viruses with special reference to TMV, Poliovirus, T4 and lambda phages, hepatitis B virus.

Protozoa: Occurrence, morphology, nutrition, perennation, locomotion, reproduction and economic importance of protozoa. A brief account of *Amoeba*, *Plasmodium*, *Trypanosoma*, *Leishmania.*

Unit-III

Introduction: Historical landmarks in Bacteriology.

Classification of bacteria: classification of Bacterial species concept, nomenclature and different systems of classification of Prokaryotes, Concept of eubacteria and archaebacteria, Differences between the two groups.

Archaebacteria: habitat, groups (halophiles, methanogens, thermoacidophiles and hyperthermophiles).

Unit-IV

Eubacteria: Groups, characteristics, and importance.

Cell organization: Cell size, cell arrangement and cell shape.

Cell wall: structure and function of Gram negative and Gram positive cell wall, endotoxins, sphaeroplast, protoplast, and L-forms.

Cell membrane: structure, function and chemical composition, Cytoplasm- ribosomes, mesosomes and cytoplasmic inclusions, Pili and flagella –structure, function and arrangement, taxes types.

Endospore –structure, formation, chemical composition & and function

Unit-V

Sterilization and disinfection: physical and Chemical control methods.

Culture media: types and preparation, culture methods.

Bacterial nutrition and growth: Requirements for microbial growth- Physical growth requirements (temperature, pH, oxygen concentration, water activity, radiations and light, pressure).

Chemical growth requirements: nutritional types, Definition of growth, growth curve, generation time and growth rate, Measurement of growth by quantitative cell mass, cell number and a cell constituent. Asexual methods of reproduction.

Bacterial Genome and General principles of bacterial recombination- homologous and non-homologous Methods of recombination in bacteria. Transformation, transduction and Conjugation.

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Second Semester

Scheme of Marks

Paper Code	Paper Name	External Assessment Max.	External Assessment Min.	Internal Assessment Max.	Internal Assessment Min.	Practical's Marks Max.	Practical's Marks Min.	Total Max. Marks.
MB201	**Botany II (Higher Plants)**	35	13	15	06			50
MB202	**Zoology II (Vertebrates)**	35	13	15	06			50
MB203	**Basics of Organic Chemistry**	35	13	15	06			50
MB204	**Cell Biology**	35	13	15	06			50
	Practical –I (Based on Paper I and II)					50	18	50
	Practical –II (Based on Paper III and IV)					50	18	50
		Total						**300**

Note: Internal assessment marks will be based on written test of concerned subject.

B.Sc. Microbiology (Hon's)

Semester-II

Paper- 5th (MB-201)

Botany II (Higher Plants)

Unit-1

Gymnosperm:- General characters and Classification of Gymnosperms. Heterospory and Origin of Seed Habit. Diversity of Gymnosperm: Geological Time Scale and Fossilization. Fossil Gymnosperms: *Lyginopteris* and *Lagenostoma*. *Morphology, Anatomy Reproduction and life cycle, of Cycas, Pinus and Ephedra.*

Unit-2

Angiosperms-: Origin and Evolution of Angiosperms. Terminology for plant description in semi technical language: Principles and rules of Botanical Nomenclature, Herbarium and Botanical gardens; Classification of Angiosperms: Bentham and Hooker, Hutchinson, and Engler & Prantals Modern trends inTaxonomy.

Unit-3

Taxonomy: Diagnostic characteristics and Economic Importance of Families – Ranunculaceae, Brassicaceae, Malvaceae, Rutaceae, Fabaceae, Apiaceae, Asteraceae, Asclepiadaceae, Solanaceae, Lamiaceae, Euphorbiaceae, Liliaceae and Poaceae.

Unit-4

Plant Physiology: - Plant Water Relations: Properties of water, Importance of water in plant life, Diffusion, Osmosis & Osmotic relation to plant cell. Water Absorption, Ascent of Sap. Transpiration: Structure & Physiology of Stomata, Mechanism of Transpiration, Factors affecting the rate of transpiration.

Photosynthesis:- Chloroplast, Photosynthetic pigments, Red drop, Emerson' effect, Concept of two Photosystems, Light reaction, Dark reaction – Calvin cycle, Hatch & Slack cycle, CAM cycle, Factors affecting rate of photosynthesis & Photorespiration.

Unit-5

Embryology: Concept of flower as a modified shoot. Structure of Anther, Microsporogenesis and Male Gametophyte. Structure of Pistil, Ovules, Megasporogenesis and Development of Female Gametophyte (Embryo Sac) and its types. Pollination– Mechanism and Agencies of Pollination, Pollen Pistil interactions and Self incompatibility. Double Fertilization and triple fusion. Development and types of endosperm and its morphological nature, Development of Embryo in Monocot and Dicot. Fruit development and maturation. Seed structure and dispersal. Mode of Vegetative Propagation.

B.Sc. Microbiology (Hon's)

Semester-II

Paper- 6th (MB-202)

Zoology II (Vertebrates)

Unit-1

Origin of Chordates Classification of phylum Chordata upto orders according to Parker and Haswell (Latest edition).
Hemichordata – External features and affinities of Balanoglossus.
Urochordata – Type study of Herdmania.
Cephalochordata – Type study of Amphioxus. Affinities of Amphioxus.

Unit-2

Comparative account of limb bones and girdles of vertebrates (Amphibia, Reptiles, Birds and Mammals).
Comparative account of digestive system.
Comparative account of respiratory system.
Comparative account of aortic arches and heart.
Comparative account of brain
Placentation in mammals.

Unit-3

Origan of life- modern concepts only.
Lamarckism, Darwinism.
Modern synthetic theories: Variations, Mutation, Isolation & speciation
Adaptation and mimicry
Micro, macro evolution and mega evolution.

Unit-4

Aquaculture

Prawn culture: Culture of fresh water prawn , methods of prawn fishing ,preservation and processing of prawns.
Pearl culture and pear industry.
Major carp culture : Management of ponds , preservation and processing of fishes.
Maintenance of Aquarium.

Unit-5

Economic Entomology

Sericulture: Species of silkworm, life history of *Bombyx mori*, Sericulture Industry in India.
Apiculture – Life cycle of the species methods of bee keeping, products of bees, enemies of bees.
Lac culture: Lifecycle, and association with the host plant.
Biological control of insect pests.

B.Sc. Microbiology (Hon's)

Semester-II

Paper- 7th (MB-203)

Basics of Organic Chemistry

Unit-1

Structure of Organic compounds, bond length, bond angle, Hydrogen bond, Resonance, Electronic effects, inductive, Mesomeric, Electromeric & Hyperconjugation. Nucleophiles and Electrophiles, Reaction intermediates Carbonium ions, Carbanions, Free radicals and Carbenes, Homolytic fission and Heterolytic fission.

Unit-2

Introduction, Nomenclature, Isomerism, Preparation and General Properties of Aliphatic hydrocarbons, Alkanes, Alkenes and Alkynes, Cycloalkanes,

Unit-3

Introduction, Nomenclature, Preperation and general properties of Alcohols, Phenols, Aldehyde and Ketones. Aromaticity.

Unit-4

Carbohydrates (monosaccarides, diasaccarides and polysaccharides): classification and general properties, Glucose and fructose (open chain and cyclic structure), Overview of primary, secondary, tertiary and Quaternary structure of proteins. Introduction, glycerides, synthetic detergents, Introduction, classification of amino acids.

Unit-5

Stereochemistry: Simple molecules , Hybridization, conformation & configuration, Geometrical isomerism, optical isomerism, Chirality, Enantiomers and optical activity

Laboratory work

Organic Chemistry:

Detection of elements– Nitrogen, Sulphur and halogens. Qualitative analysis – detection of functional groups (phenolic,carboxylic, carbonyl, esters, carbohydrates, amines, amides, nitro etc.) in simple organic compounds.

Books:

1.Bahl A and Bahl BS: Advanced Organic Chemistry. S. Chand
2.Finar L. Organic Chemistry (Vol. I & II)

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Semester-II

Paper- 8th (MB-204)

Cell Biology

Unit-1

Introduction, Scope and Importance, History of Cytology. Prokaryotic cell, Eukaryotic cell (Plant and Animal Cell). Structure of cell wall.

Plasma membrane: structure and functions (simple diffusion, facilitated diffusion, active transport, endocytosis, pinocytosis, phagocytois, and exocytosis).

Unit-2

Structure and functions of mitochondria, chloroplast. Structure and functions of Endoplasmic reticulum, Endoplasmic reticulum targeting proteins, protein folding and processing in ER, Targeting of lysosomal protein. Structure and function of Golgi complex, Protein Glycosylation within the Golgi. Structure and functions of Ribosome. Lysosome and Inracellular digestion.

Unit-3

The nucleus and nucleolus. structure and classification of Chromosomes.

Chromosome structure and its types. Lampbrush and Polytene Chromosomes.

Cellular reproduction: Cell cycle- mitosis and meiosis.

Unit-4

Cell Motility and Shape I: Structure and function of microfilaments and Intermediate Filaments. Molecular Mechanisms of Cell-Cell Adhesions. Extracellular Matrix of animals, Cell signaling. Introduction and application of stem cells.

Unit-5

General introduction of Cancer, Apoptosis and necrosis.

Techniques in cell biology: chromosomal banding techniques. Principles and applications of light microscope and electron microscope (Scanning and transmission). Karyotyping and Idiogram.

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Third Semester

Scheme of Marks

Paper Code	Paper Name	External Assessment Max.	External Assessment Min.	Internal Assessment Max.	Internal Assessment Min.	Practical's Marks Max.	Practical's Marks Min.	Total Max. Marks.
MB301	**Computer Application**	35	13	15	06			50
MB302	**Fundamentals of Biochemistry**	35	13	15	06			50
MB303	**Microbial Genetics and Molecular Biology**	35	13	15	06			50
MB304	**Biostatistics**	35	13	15	06			50
	Practical –I (Based on Paper I and II)					50	18	50
	Practical –II (Based on Paper III and IV)					50	18	50
		Total						**300**

Note: Internal assessment marks will be based on written test of concerned subject.

B.Sc. Microbiology (Hon's)

Semester-III

Paper- 9th (MB-301)

Computer Application

Unit I

Introduction to computer: History and Generation of computer, Characteristic to computer, Classification: digital, analogue, hybrid, Micro, mini and Super, Components of computer System.

Unit II

Introduction to Operating system: Need, functions, control programs, OS supervisor, Job control programs concurrent, C. S., popular OS for PC's. Introductions to DOS, Internal commands, External commands, (TREE, UNDELTE, CHKDSK, FDISK, FC, BACKUP, RESORE, FORMAT, UNFORMAT, JOIN, XCOPY)

Unit III

Introduction to windows: Program manager, file manager, customizing windows with control panel, print manager. File shearing. Computer languages.

Unit IV

Introduction to MS office: The office manager, Starting information with MS office, The clipboard, Word, Excel, Power point. Word processing with word; word basis, Undo, redo, repeat, Insert, text, replace Text, copying form one word document to other. Printing, auto formation, autocorrect.

Unit V

Internet- introduction and application: LAN, WAN, MAN, WWW, Search engines,WiFi,LiFi.

B.Sc. Microbiology (Hon's)

Semester-III

Paper- 10th (MB-302)

Fundamentals of Biochemistry

UNIT-1

The foundation of biochemistry: Biochemical organization of Cell, Intra and inter molecular forces electrostatic interactions and Hydrogen bonding interaction, vander Waals and Hydrophobic interactions, Disulphide bridges, Role of water and weak interactions, Chemical foundations of Biology- pH, pK, acids, bases, buffers, weak bonds & Covalent bonds.

UNIT-2

1. Carbohydrates: classification, structure, functions; homo and hetero polysaccharides,animal, plant and microbe specific polysaccharides.

2. Lipids: Classification, nomenclature, structure and property of fatty acids,Simple lipids- Triglisrids, fates and Waxes. Compound lipids- classification, structure, distribution, and biological importance, role of prostaglandine,leukotrins and thromboxans, Sterols- Cholestrol, role in biological system. Tarpenes and phenols.

UNIT -3

1. Nucleic acids: Structure, Properties of purines and pyrimidine bases,DNA : Structure, conformation, prokaryotic and eukaryotic DNA, nucleotides,Chromosomal and extrachromosomal DNA

2. RNA: Structure, types and function of mRNA, tRNA, Ribozymes: structure and functions.

UNIT-4

3. Amino acids- classification, structure, property, Zwitter ion, titration curve and biologically important amino acids

5. Proteins: Classification, Primary structure, nature of peptide bond, secondary structure, hydrogen bonding, salt bridge, disulphide bonds, hydrophobic and hydrophilic interaction in proteine and role of these bonds in protein folding, α-helix, β- sheet, and beta turns structures etc.Tertiary and quaternary structure. Biological role of proteins.

UNIT-5

Enzymes; General characteristics and Catalytic power of enzymes and their classification, Energy considerations, Factors affecting enzyme activity, Enzyme kinetics, Michaelis- Menten equation, Allosteric enzymes .Vitamins and cofactors: Structure, distribution, interaction and biological properties Hormones- structure, distribution and function.

B.Sc. Microbiology (Hon's)

Semester-III

Paper- 11th (MB-303)

Microbial Genetics and Molecular Biology

Unit -1

Introduction: Historical developments in the field of genetics. Organisms suitable for genetic experimentation and their genetic significance.
Mendelian genetics: Mendel's experimental design, monohybrid, di-hybrid and try hybrid crosses, Law of segregation & Principle of independent assortment.

Unit -2

Allelic interactions: Concept of dominance, excessiveness, incomplete dominance, co-dominance, pleiotropy, multiple alleles. **Non allelic interactions:** Interaction producing new phenotype-complementary genes, epistasis (dominant & recessive), duplicate genes.

Chromosome organization: Structure and characteristics of bacterial and eukaryotic chromosome-chromosome morphology, concept of euchromatin and heterochromatin, packaging of DNA molecule into chromosomes, chromosome banding pattern, karyotype, giant chromosomes

Unit-3

Structure of prokaryotic and eukaryotic genomes, molecular basis of life. nucleic acids as genetic material, structure of DNA and its alternative forms, structure and types of RNA, DNA replication in prokaryotes (enzymology and process): bacterial and Viral replication.

Unit-4

Prokaryotic gene expression: Prokaryotic transcription. Genetic code, Prokaryotic translation.
Regulation of gene expression: Operon concept (Lac and Trp operon)
Transposable elements (Prokaryotic and eukaryotic).

Unit-5

DNA recombination in Eukaryotes and Prokaryotes: molecular mechanisms,
Transformation, Conjugation, Transduction: Specialized transduction and generalized transduction, Barriers to genetic exchange (host restriction and modification).
Mutation (point mutation, frame shift mutation) chromosomal aberration and DNA repair.

Paper- 12th (MB-304)

Biostatistics

UNIT – I

Collection of Data, Classification and Tabulation of Data : Graphical presentation, bar charts, Pie diagrams,Graphs, Measures of Central Tendency, Measures of Dispersion. Correlation and Regression.

UNIT – II

Statistical Population, Sample from Population, classical definition of probability, Probability Distribution, Binomial Poisson and Normal Distribution.

UNIT – III

Parameters and Statistics, Sampling Distribution, Theory of Error, Test of Significant, Mean and Standard deviation, chi-square test for goodness of fit, T-test, Analysis of Variance.

UNIT – IV

Multivariate, Analysis. Design of Experiments, randomization, replication, local control, complimentary, Randomized, randomized block design.

UNIT – V

Factor Analysis. Path analysis, Classification and Discriminant Analysis Tools: CART, Random forests, Fisher's discriminant functions. Neural networks. Multilayer perception,algorithm, exploratory data analysis.

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Fourth Semester

Scheme of Marks

Paper Code	Paper Name	External Assessment Max.	External Assessment Min.	Internal Assessment Max.	Internal Assessment Min.	Practical's Marks Max.	Practical's Marks Min.	Total Max. Marks.
MB401	**Biophysical and Molecular techniques**	35	13	15	06			50
MB402	**Virology**	35	13	15	06			50
MB403	**Microbial Physiology & Metabolism**	35	13	15	06			50
MB404	**Entrepreneurship and IPR**	35	13	15	06			50
	Practical –I (Based on Paper I and II)					50	18	50
	Practical –II (Based on Paper III and IV)					50	18	50
		Total						**300**

Note: Internal assessment marks will be based on written test of concerned subject.

B.Sc. Microbiology (Hon's)

Semester-IV

Paper- 13th (MB-401)

Microbial, Biophysical and Molecular techniques

Unit-1

Autoclave, Hot air oven, Incubator, Laminar air flow, Balance, Cell counting, Micrometer, Lyophilizer, Microscope, PH Metter, Buffer, Handerson and Hasselblach equation, Titration of weak acid and weak bases, Tracer Technique.

Unit-2

Spectroscopic Technique: Principle and its applications- UV, visible and Fluorescence spectroscopy, X-ray Diffraction, Nuclear Magnetic Resonance (NMR)

Unit-3

Chromatographic Technique: Principle and its Application, Types(Adsorption and Partition Chromatography). Paper, Thin layer, Ion-Exchange, HPLC.

Unit – 4

Centrifugation Technique,
Electrophoresis of DNA, proteins and enzymes. Southern, Northern and Western blotting

Unit-5

DNA Fingerprinting (VNTR)
PCR and its different variations.
DNA sequencing

B.Sc. Microbiology (Hon's)

Semester-IV

Paper- 14th (MB-402)

Virology

Unit-1

Introduction: Discovery and origin of viruses, Definition, Nature, General properties, structure and morphology of virus., Characteristics and Classification of plant viruses.

Unit-2

Characteristics and Classification of animal/human virus, Measurements of virus. Concepts of viroids, satellite viruses, virusoids and prions.

Unit-3

Nomenclature of different groups of viruses infecting bacteria, fungi, algae, Structure & Characters of Tobacco mosaic virus, Salient features of pox, herpes, hepatitis, rhabdo, influenza viruses.

Unit-4

Viral genomes: Structure and organization, Viral multiplication cycle (one step growth curve), Replication strategies**:** Interaction of viruses with cellular receptors, different modes of entry, different transcriptional methods of replication of viruses

Unit-5

History, structure and morphology of bacteriophage, Classification of bacteriophage, Detailed description of lytic cycle, Detailed description of lysogenic cycle.

B.Sc. Microbiology (Hon's)

Semester-IV

Paper- 15th (MB-403)

Microbial Physiology & Metabolism

Unit -1

Nutritional classification of microorganisms and Nutrient uptake: Passive and facilitated diffusion, active transport, Specific transport systems-ATP linked ion motive pumps, porins, Overview of cell growth **:** Growth curves, growth rate and generation time, Primary and secondary metabolite production during different growth phases, synchronous growth. Batch culture and Continuous culture.

Unit -2

Effect of environment on microbial growth : Osmolarity, water activity, oxygen, pH, temperature, radiation, Carbon Metabolism: Glycolysis, Entner-Doudoroff pathway, pentose phosphate pathway, Tricarboxylic acid cycle, glyoxalate cycle and gluconeogenesis.

Unit –3

Mitochondrial and bacterial electron transport chain: Aerobic and anaerobic respiration. Oxidative phosphorylation, mechanism and hypotheses, Bacterial fermentations: Alcoholic, lactic acid, butyric acid, mixed acid, 2, 3-butanediol, propionic acid and acetic acid fermentations.

Unit -4

Nitrogen metabolism: Nitrogen cycle, Nitrate reduction: assimilatory vs. dissimilatory, nitrification, denitrification, Biological nitrogen fixation, symbiotic and free living organisms, Mechanism of nitrogen fixation, properties of nitrogenase, ammonia assimilation.

Unit -5

Photosynthesis: A historical account, oxygenic vs. an oxygenic photosynthesis. Mechanism of photosynthesis in bacteria, cyanobacteria algae and halobacteria. Carbon dioxide fixation: Calvin Cycle. Chemolithotrophy: Nitrifying bacteria, iron bacteria, hydrogen bacteria , sulphur bacteria,

B.Sc. Microbiology (Hon's)

Semester-IV

Paper- 16th (MB-404)

Entrepreneurship and IPR

UNIT I

Entrepreneurship: Definition, characteristics, importance, types and functions of an entrepreneur, qualities of a good entrepreneur; entrepreneurial motivation factors.

UNIT II

Women entrepreneurship: Opportunities and problems, search and selection of business idea.
Basics of production management: Methods of manufacturing-Project/Jobbing, Batch Production, Flow/Continuous production, process production-Characteristics of each Method.

UNIT III

Preparation of project report: Preparation of preliminary project report, main elements of a detailed project report, selection of types of organization and factors influencing the choice of organization, sole proprietorship, partnership, co-operative society.

UNIT IV

Public policy, regulatory and ethical challenges facing the biotechnology, Entrepreneurship, Business development for medical products, Business development for consumable products

UNIT V

Patenting System: WTO, Paris Convention, Indian Legislations, Intellectual Property Right: Copy Right & Industrial Properties, Trademarks, Designs, Geographical Indications, IPR & Technology transfer, Role of patentee & Licensor, Patent process & Patent laws & e-filing

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Fifth Semester

Scheme of Marks

Paper Code	Paper Name	External Assessment		Internal Assessment		Practical's Marks		Total Max. Marks.
		Max.	Min.	Max.	Min.	Max.	Min.	
MB501	**Recombinant DNA Technology**	35	13	15	06			50
MB502	**Mycology & Plant pathology**	35	13	15	06			50
MB503	**Immunology**	35	13	15	06			50
MB504	**Environmental Studies.**	35	13	15	06			50
	Practical –I (Based on Paper I and II)					50	18	50
	Practical –II (Based on Paper III and IV)					50	18	50
		Total						**300**

Note: Internal assessment marks will be based on written test of concerned subject.

B.Sc. Microbiology (Hon's)

Semester-V

Paper- 17th (MB-501)

Recombinant DNA Technology

Unit I

The recombinant DNA Technology: General concept and principle of cloning, Enzymes: Nucleases and restriction endonucleases- properties and types; phosphomonoesterases; polymerase; terminal deoxynucleotidyl transferase; poly A polymerase, Linkers, adaptors and homopolymer tailing. Prokaryotic host- vector system: Characteristics of E.coli as host; vectors for cloning in E.coli. (plasmid pBr322, pUC, bacteriophage- EMBL)

Unit II

Design and characteristics of expression vectors for cloning in prokaryotes and factors that affect expression. Cloning in Yeast: Properties of yeast as host for cloning and different types of vectors designed for cloning in yeast, Plant transformation technology: Features of Ti and Ri plasmids, mechanism of DNA transfer. Methods of introduction of foreign DNA in animal system; Vectors for cloning in animal system- SV-40,

Unit III

Methods for Constructing rDNA and cloning: Inserts; vector insert ligation; infection, transferring and cloning ,Methods for screening and selection of recombinant clones , DNA Libraries: types, advantages and disadvantages of different types of libraries; Different methods for constructing genomic and full length cDNA libraries.

Unit IV

Principles and applications of Blotting techniques- Southern, Northern, Western and Eastern blotting; Polymerase Chain reaction and types (multiplex, nested, RT, real time, touchdown PCR, hot start PCR, colony PCR). Blotting techniques (Southern, northern and western).

Unit V

DNA fingerprinting and DNA footprinting. restriction fragment length polymorphism.Application of Recombinant DNA technology in Medicine & Industry. Application of Recombinant DNA technology in Medicine & Industry. Si RNA and si RNA technology: Micro RNA Construction of si RNA vectors: Gene silencing and its applications in agro industry.

B.Sc. Microbiology (Hon's)

Semester-V

Paper- 18th (MB-502)

Fungi and Plant Pathology

Unit-1

Introduction to fungi: Habitat, fungal cells structure and thallus organization, wall structure, different types of reproductive structures-asexual and sexual, Classification of Fungi, Lichens: A general account, Economic importance of fungi.

Unit-2

Salient features of different groups and detailed study of the following genera
i. Chytridiomycota: *Synchytrium, Allomyces*
ii. Zygomycota: *Rhizopus* and *Mucor*
iii. Ascomycota: *Saccharomyces, Emericella (Aspergillus), Talaromyces*, *Penicillium*.
iv. Basidiomycota: *Agaricus* and *Ustilago*.
v. Deuteromycota: *Candida* and *Fusarium*.
vi. Cellular slime molds: *Dictyostelium*.
vii. True slime molds (Myxomycetes-exosporous and endosporous).
viii. Oomycota: *Saprolegnia, phytophthora,Pythium,Peronospora and Albugo*

Unit-3

Introduction: Concept of plant disease, significant landmarks in the field of plant pathology, Signs and symptoms associated with microbial plant pathogens, Koch's postulates basic procedures in the diagnosis and study of plant diseases, Factors affecting disease development, Disease forecasting.

Unit-4

Microbial Pathogenicity: Microbial enzymes, toxins, growth regulators & suppressors of plant defenses in plant diseases, Mechanism of Defense in Plants. Control of Plant diseases: Physical, chemical and biological control, Management of plant diseases: Principles & practices involved in the management of plant diseases by different methods, *viz.*, regulatory (quarantine & legislative measures).

Unit-5

Important diseases caused by fungi: Clubroot of crucifers *Plasmodiophora brassicae*, White Rust *Albugo*, Downy mildew *Perenospora*, Late blight of potato *Phytophthora*, Powdery mildew *Erysiphe*, Ergot of rye *Claviceps pupurea*, Rust of wheat *Puccinia graminis tritici*, Loose smut of wheat *Ustilago tritici*, Fusarium wilts *Fusarium* sp., Red rot of sugarcane *Colletotrichum falcatum*., Tikka disease of *Cercospora arachidola* groundnut, Important diseases caused by Phyto-pathogenic bacteria, Angular leaf spot of cotton, Bacterial leaf blight of rice, Soft rot of Potato, Crown galls, Bacterial cankersof citrus, Common scab of potato. Important diseases caused by Phytoplasmas, Aster yellow, little Leaf of brinjal, Sandal spike disease, Root wilts of coconut. Important diseases caused by viruses Tobacco mosaic, Leaf curl of papaya, Bean mosaic, Tomato yellow leaf curl, Banana bunchy top.

B.Sc. Microbiology (Hon's)

Semester-V

Paper- 19th (MB-503)

Immunology

Unit-1

Historical background, innate and acquired immunity, Humoral and cell mediated immunity, organs and cells involved in immune response.

Unit-2

Identification and characterization of T and B cells, cell surface receptors, MHC types & importance, Antigen characteristics, types of antigens

Unit-3

Adjuvants, immunogenicity, antigenicity, Immunoglobulin structure and properties, Types of immunoglobulin

Unit-4

Theories of antibody diversity, Monoclonal antibodies and their production, Complement system.

Unit-5

Antigen - antibody reactions, Methods-agglutination, precipitation, complement fixation, ELISA & Radioimmunoassay, Haemagglutination test, Immunoblotting, FACS.

B.Sc. Microbiology (Hon's)

Semester-V

Paper- 20th (MB-504)

Environmental Studies

Unit 1

The multidisciplinary nature of Environmental Studies, Definitions, scopes & importance, need for public awareness. Natural resources:, renewable & non renewable resources, natural resources & associated problems of forest, water, minerals, food, energy & land resources. Conservation of natural resources, Environmental Ethics:, issues & possible solutions, water conservation, rain water harvesting & watershed management, resettlements & rehabilitation of peoples.

Unit 2

Ecosystems; Concept of an ecosystem, structure & function of an ecosystem, energy flow in the ecosystem, ecological succession, food chain, food webs & ecological pyramids. Types, characteristic features, structure & function of following ecosystem; forest ecosystem, grassland ecosystem, desert ecosystem, aquatic ecosystem (ponds, streams, lakes, rivers, oceans, estuaries etc.)

Unit 3

Concepts of Biodiversity**:** Definition of Genetic species & ecosystem diversity, biogeographical classification of india- value of diversity: consumptive use, productive use, social, ethical, Aesthetic & option values. Biodiversity at global, national & local levels. Hotspot of diversity, threats to biodiversity: habitat loss, poaching of wild life, man wild life conflicts. Endangered & endemic species of india, conservation of biodiversity.

Unit 4

Definition of environmental pollution, causes, effects, & control measures of air, water, soil, marines, thermal & noise pollution. Climate Change: global warming, acid rain, ozone layer depletion & nuclear accidents. Solid Waste management: causes, effect & control measures of urban & industrial wastes. Role of an individual in prevention of pollution.

Unit 5

Disaster managements: Floods, earthquakes, cyclones, & landslides. Waste lands reclamation, Consumerism & waste product. Population explosion: family welfare programmes, environment & human health, HIV/AIDS: Role of information technology in environmental & human health. Environmental legislation: environment protection act. Air(prevention & control of pollution) Act. Water (prevention & control of pollution) Act. Wild life protection Act. Forest conservation Act.

Centre for Microbiology Studies
A.P.S. University Rewa (M.P.)

B.Sc. (Hons.) Microbiology

Sixth Semester

Scheme of Marks

Paper Code	Paper Name	External Assessment		Internal Assessment		Practical's Marks		Total
		Max.	Min.	Max.	Min.	Max.	Min.	Max. Marks.
MB601	**Medical Microbiology**	35	13	15	06			50
MB602	**Food & Dairy Microbiology**	35	13	15	06			50
MB603	**Microbial Ecology**	35	13	15	06			50
MB604	**Industrial Microbiology**	35	13	15	06			50
	Practical –I (Based on Paper I and II)					50	18	50
	Practical –II (Based on Paper III and IV)					50	18	50
		Total						**300**

Note: Internal assessment marks will be based on written test of concerned subject.

B.Sc. Microbiology (Hon's)

Semester-VI

Paper- 21st (MB-601)

Medical Microbiology

Unit-1

Early discovery of pathogenic microorganisms; development of bacteriology as scientific discipline, Contributions made by eminent scientists., Classification of medically important micro organisms, Normal microbial flora of human body; role of the resident flora; normal flora and the human host.

Unit-2

Host parasite relationship: Definition of following terms (infection, invasion, pathogen, pathogenesis, toxigenecity, virulence, carrier, types of carrier, nosocomial infections, opportunistic infections, sepsis, and septicemia), Transmission of infection, bacterial virulence factors, Establishment, spreading, tissue damage and anti-phagocyte factors, Mechanism of bacterial adhesion, colonization and invasion of mucous membranes of respiratory, enteric and urogenital tracts.

Unit-3

Diseases caused by certain specific pathogens *Staphylococcus aureus, Streptococcus pneumonia*.
Diseases caused by *Mycobacterium tuberculosis, Salmonella typhi, Vibrio cholerae*.
Disease caused by Plasmodium

Unit-4

Diseases caused by Human Immuno Deficiency Virus, Hepatitis Virus, Rubella ,Virus, Rabies virus, Rubella virus, Small pox virus, Dermatophytes, *Candidiasis, Aspergillosis*.

Unit-5

Collection and transport of appropriate clinical samples for clinical diagnostics, Culture media isolation of pathogenic bacteria & fungi, Staining techniques: Gram's staining, AFB staining, Capsule staining, Biochemical test: IMVIC, TSIA, Oxidase, Catalase, DNAs

B.Sc. Microbiology (Hon's)

Semester-VI

Paper- 22nd (MB-602)

Food & Dairy Microbiology

Unit-1

Food as substrate for microorganisms: Micro organisms important in food microbiology -Molds, Yeasts and Bacteria-General characteristics-classification and importance, Factors influencing microbial growth and survival in food - Intrinsic factors and Extrinsic factors, Food Spoilage: General principles underlying food spoilage and contamination spoilages

Unit-2

Principles of food preservation. Asepsis - Removal of microorganisms, (anaerobic conditions, high temperatures, low temperatures, drying,), Principles of food preservation, chemical, Food additives.& Physical preservatives, Canned food.

Unit-3

Fermented Food: Bread, Vinegar, Oriental Fermented Food, Indian Fermented Food, Fermented Beverages, Beer and Wine.

Unit-4

Importance of microorganisms in dairy industries. Production of cheese, curd and yogurt, Microbial spoilage of Milk. Principal & types of Pasteurization, Milk reduction test: MBRT

Unit-5

Microorganisms as source of food: SCP, Mushroom production, Food Borne Infections: Food poisoning. Infective and toxic, Bacterial and non-bacterial. General methods of their diagnosis, Organisms from common food items such as curd and bread.

B.Sc. Microbiology (Hon's)

Semester-VI

Paper- 23rd (MB-603)

Microbial Ecology

Unit-1

Definition of environment, Interaction between environment and biota, Concept of habitat in biosphere, Food Chain, Food web, Ecosystem, Community, homeostasis and ecosystem management. Biodiversity and its conservation.

Unit-2

Environmental factors influencing the growth and survival of microorganisms. Physical factors - temperature, light, osmotic pressure and hydrostatic pressure. Chemical factors - pH, O2 and CO2 Soil environments-Microorganisms, soil structure, soil profile, Physico-chemical conditions, Microbial composition, sampling techniques.

Unit –3

Biological factors - Inter-reactions of microbial population and community i.e. Symbiosis, Parasitism, Antagonisms, Commensalisms, Extremophiles-acidophilic, alkalophilic, thermophilic, barophilic and osmophilic microbes, Halophiles microbes, Eutrophication and its management

Unit-4

Biodeterioration : Concept of biodeterioration, Biodeterioration of Wood, pharmaceutical products, Bioleaching: Introduction , application of bacterial leaching, leaching techniques, prospective of bioleaching, Coal desulphurization, Role of microorganism in organic matter decomposition (Cellulose, Hemicellulose, Lignins)

Unit-5

Biogeochemical cycles - Nitrogen cycle - Nitrogen fixation, nitrification, denitrification , Sulphur iron and phosphorous cycles , Rhizosphere - Rhizosphere microorganisms. Biochelators (siderophores), Bioremediation, Biodegradation of xenobiotics, Biosurfactants

Semester-VI

Paper- 24th (MB-604)

Industrial Microbiology

Unit-1

Brief history & development of industrial microbiology, General concepts of industrial microbiology, Screening of industrially important microbial strains, strain development and strain Improvement, Preservation & maintenance of industrial microbes

Unit-2

Industrial sterilization, fermentation equipment and its uses , Fermentation process - batch, fed-batch & continuous fermentations, submerged and solid state fermentation, Types of fermenter /bioreactor (constantly stirred tank, packed bed fluidized & air –lift fermenter)

Unit-3

Media and materials required for industrial microbiological processes - sources, formulation, antifoams and optimization, Maintenance of PH, temperature, dissolved oxygen & aeration. Down stream processing.

Unit-4

Industrial production antibiotics-Penicillin, Industrial production of citric acid and amino acids.
Industrial production of enzymes- amylase .

Unit-5

Industrial production of ethanol
Industrial production of acetic acid
Industrial production of Vitamins
Industrial production of bear & wine alcohol.

DEPARTMENT OF ENGLISH

AWADHESH PRATAP SINGH UNIVERSITY, REWA

B. A. English-Sem.-I

S.No.	Paper Name	Credits	Scheme of Marks		Total
			External	Internal	
Paper-1	Major –British Poetry and Drama 14th and 17th Centuries	6	60	40	100
Paper-2	Minor- General Psychology	6	60	40	100
Paper-3	Generic Elective – Academic Writing and Composition	4	60	40	100
Paper-4	Ability Enhancement Compulsory course: English Communication	4	60	40	100
		20			400

B.A. English Sem.-II

S.No.	Paper Name	Credits	Scheme of Marks		Total
			External	Internal	
Paper-1	Major- European Classical Literature	6	60	40	100
Paper-2	Minor- Community Psychology	6	60	40	100
Paper-3	Generic Elective- Media and Communication Skills	4	60	40	100
Paper-4	Ability Enhancement Compulsory course Environment studies	4	60	40	1O0
		20			400

PAPER- 1

Major

BRITISH POETRY AND DRAMA: 14TH TO 17TH CENTURIES

Course Credits: 6

Learning Outcomes

Some of the course learning outcomes that students of this course are required to demonstrate run thus: understand the tradition of English literature from 14th to 17th centuries.

- develop a clear understanding of Renaissance Humanism that provides the basis for
- the texts suggested engage with the major genres and forms of English literature and develop
- fundamental skills required for close reading and critical thinking of the texts and concepts appreciate and analyze the poems and plays in the larger socio-political and religious
- contexts of the time.

Course Content

1. Poetry from Chaucer to Donne

1.1 **Geoffrey Chaucer** *The Wife of Bath's Prologue*

1.2 Edmund Spenser Selections from *Amoretti*:

Sonnet LXVII 'Like as a huntsman...'

Sonnet LVII 'Sweet warrior...'

Sonnet LXXV 'One day I wrote her name...'

1.3 John Donne: 'The Sunne Rising',

'Batter My Heart'

'Valediction: Forbidding Mourning'

2. **Christopher Marlowe** : *Doctor Faustus*

3**. William Shakespeare** *Macbeth*

4. **William Shakespeare** *Twelfth Night*

5. **John Milton** *On His Blindness* and *Lycidas*

Suggested Topics

- Renaissance Humanism
- The Stage, Court and City
- Religious and Political Thought
- Ideas of Love and Marriage

- The Writer in Society

Suggested Readings

- Pico Della Mirandola, excerpts from the *Oration on the Dignity of Man,* in *The Portable Renaissance Reader,* ed. James Bruce Ross and Mary Martin McLaughlin (New York: Penguin Books, 1953) pp. 476–9.
- John Calvin, 'Predestination and Free Will', in *The Portable Renaissance* Reader,ed. James Bruce Ross and Mary Martin McLaughlin (New York: Penguin Books,1953) pp. 704–11.
- Baldassare Castiglione, 'Longing for Beauty' and 'Invocation of Love', in Book 4 of *The Courtier*, 'Love and Beauty', tr. George Bull (Harmondsworth: Penguin, rpt. 1983) pp. 324– 8, 330–5.
- Philip Sidney, *An Apology for Poetry*, ed. Forrest G. Robinson (Indianapolis: Bobbs-Merrill, 1970) pp. 13–18.

Paper-2

Minor-**General Psychology**

Course Credits: 6

Learning Outcomes

1. Developing knowledge of the basic concepts in psychology.

2. Developing skills for applying psychological knowledge to real life situations so as to improve interpersonal interactions and adjustment in life.

Course Content

Unit 1:

1.1 Nature of Psychology: Definition, Schools of modern psychology

1.2 Psychology in India: History and current status

Unit 2: Orientation to Psychology: Nature, fields and applications of psychology;

Cognitive Processes: Learning, memory and problem solving;

Conative Processes: Motivation, types of motives (Sociogenic/Psychogenic motives);

Affective Processes: Emotion, Positive and negative emotion

Unit 3: Psychology of Individual Differences: Theories of personality: Freudian psychoanalysis, type and trait; humanistic;

Theories of intelligence: Spearman 'g' theory, Sternberg and Gardner; Emotional intelligence;

Assessment of intelligence and personality

Unit 4: Understanding Developmental Processes: Cognitive Development: Piaget; Moral Development: Kohlberg;

Psycho-social Development: Erikson

Unit 5: Applications of Psychology: Work; Health

References:

Ciccarelli , S. K & Meyer, G.E (2008). Psychology (South Asian Edition). New Delhi: Pearson

Feldman.S.R. (2009).Essentials of understanding psychology (7th Ed.) New Delhi : Tata McGraw Hill.

Michael ,W., Passer, Smith,R.E. (2007). Psychology The science of mind and Behavior. New Delhi:Tata McGraw-Hill

Paper-3

Generic Elective: ACADEMIC WRITING AND COMPOSITION

Course Credits: 4

Learning Outcomes

Students will learn to

- convey their ideas in English using simple and acceptable English in writing
- understand to recognize and draft different types of writing – e.g. classroom notes,
- summaries, reports, exploratory and descriptive paragraphs, substantiating etc describe a diagram or elaborate information contained in a graph, chart, table etc
- write a review of a book or a movie
- write a report on an academic or cultural event that takes place in a college or university for a journal or a newspaper

Course Contents

1.1. Introduction to the Writing Process

1.2. Introduction to the Conventions of Academic Writing

2.1. Writing in one's own words: Summarizing and Paraphrasing

2.2. Study Skills including note making, note taking, information transfer, reviewing etc.

3. Structuring an Argument: Introduction, Interjection, and Conclusion

4. Critical Thinking: Syntheses, Analyses, and Evaluation

5. Citing Resources; Editing, Book and Media Review

Suggested Readings

Liz Hamp-Lyons and Ben Heasley, *Study writing: A Course in Writing Skills for Academic Purposes* (Cambridge: CUP, 2006).

Renu Gupta, *A Course in Academic Writing* (New Delhi: Orient BlackSwan, 2010).

Ilona Leki*, Academic Writing: Exploring Processes and Strategies* (New York: CUP, 2nd edn, 1998).

Gerald Graff and Cathy Birkenstein, *They Say/I Say: The Moves That Matter in Academic Writing* (New York: Norton, 2009).

Eastwood, John. (2005) *Oxford Practice Grammar*. Oxford, OUP

Wallace, Michael. (2004). *Study Skills*. Cambridge, CUP

Paper-4

AECC: English Communication

Course Credits: 4

Learning Objectives:

The purpose of this course is to introduce students to the theory, fundamentals and tools of communication and to develop in them vital communication skills which should be integral to personal, social and professional interactions.

1. **Basic Language Skills**:

1.1 Vocabulary Building: Suffix, Prefix, Synonyms, Antonyms, Homophones, Homonyms and one-word substitution.

1.2. Basic Grammar: Noun, Pronoun, Adjective, Verb, Adverb, Prepositions, Articles, Time and Tense

2.1. **Introduction: Theory of Communication, Types and modes of Communication**

2.2. Language of Communication: Verbal and Non-verbal (Spoken and Written) Personal, Social and Business Barriers and Strategies Intra-personal, Inter-personal and Group communication

3. **Speaking Skills:**

Monologue

Dialogue

Group Discussion

Effective Communication/ Mis- Communication

Interview

Public Speech

4. **Reading and Understanding**

Close Reading

Comprehension

Summary

Paraphrasing

Analysis and Interpretation

5. **Writing Skills**:

Documenting,

Report Writing,

Making notes,

Letter writing

Recommended Readings:

1. Fluency in English - Part II, Oxford University Press, 2006.

2. Business English, Pearson, 2008.

3. Language, Literature and Creativity, Orient Blackswan, 2013.

4. Language through Literature (forthcoming) ed. Dr. Gauri Mishra, Dr Ranjana Kaul, Dr Brati Biswas

Learning Outcomes :

1. Prepare for various competitive exams by developing their English language competence.

2. Promote their comprehension skills being exposed to a variety of texts and their interpretations

3. Build and enhance their vocabulary.

4. Develop their communication skills by strengthening grammar and usages.

It is hoped that after studying this course, students will find a difference in their personal and professional interactions.

PAPER 1:

Type - Major

Title -EUROPEAN CLASSICAL LITERATURE

Course Credits: 6

Learning Outcomes :

- historically situate classical European, i.e., Greek and Latin literary cultures and their
- socio-political-cultural contexts engage with classical literary traditions of Europe from the beginning till the 5th
- century AD grasp the evolution of the concept of classic and classical in the European literary
- thinking and its reception over a period of time appreciate classical literature of Europe and pursue their interests in it
- examine different ways of reading and using literary texts across a wide range of classical authors, genres and periods with comparative perspectives
- develop ability to pursue research in the field of classic
- develop academic and practical skills in terms of communication and presentation and also learn about human and literary values of classical period

Course Content

1.Classical Drama:

1.1 Comedy and Tragedy in Classical Drama

1.3 Literary Culture in Augustan Rome

2**. Classical Epic Poetry**

Homer: selections from *The Illiad*

Virgil, selections from the *Aeneid*

3. **Classical Tragedy**

Sophocles: *Antigone* or Oedipus Rex

a. Oedipus Rex: Summary and analysis

b. Oedipus Rex : a classical and modern tragedy

4. Classical Poetry

4.1 Horace : Life and works

4.2 Horace: *Satires (*textual analysis)

5.**Classical Comedy**

Plautus: Selections from *The Ghost or Menaechmi*

Suggested Readings

Homer, *The Illiad*. Tr. E.V. Rieu. Harmondsworth: Penguin, 1985.

Sophocles, *Oedipus the King*. Tr. Robert Fagles in *Sophocles: The Three Theban Plays.* Harmondsworth: Penguin, 1984.

Richard Rutherford*, Classical Literature: A Concise History*. Oxford: Blackwell Publishing, 2005.

Paper -2

Type-Minor

Community Psychology

Course Credits: 6

Learning Outcomes

1. Understanding the role of Psychology in development.

2. Developing an appreciation of the core values that guide community psychology and facilitate community functions.

3. Developing insights with respect to health promotion programs in communities

4. Community programme for child and maternal health, for physically challenged and elderly people in the Indian context, through case studies

Course Content

1. **Introduction to community Psychology**

Definition of community psychology;

Types of communities – locality based and relational;

Models: ecological level analysis of community, conceptual level model.

2. **Core values in community psychology**:

- Individual and family wellness;
- sense of community;
- respect for human diversity;
- social justice;
- empowerment and citizen participation;
- collaboration and community strengths.

3.**Community functions** – learning, socialization, and supportive functions.

4**. Communities as setting for health promotion**

4.1 Need and process of community organization and building for health promotion programming
4.2 Community programme for child and maternal health, for physical challenged and old age in the Indian context.

5. **Interventions for Community Development and Empowerment**

5.1 Concept and practices for community development and empowerment

5.2 Case studies of community intervention programs by the governmental and nongovernmental organizations in Indian context such as, rural panchayat programs, children's education, citizen right, self- help group, social accounting.

Suggestive readings:

- Banerjee, A., Banerji, R., Duflo, E., Glenneske, R., & Khenani, S. (2006) Can Information Campaign start local participation and improve outcomes? A study of primary education in Uttar Pradesh, India, World Bank Policy Research, Working Paper No.3967
- Fetterman, D.M., Kaftarian, S.J. & Wandersman, A (Eds)(1996) Empowerment Evaluation, New Delhi : Sage Publication.
- Kloos B. Hill, J Thomas, Wandersman A, Elias M.J. & Dalton J.H. (2012). Community Psychology: Linking Individuals and Communities, Wadsworth Cengage Learning.
- McKenzie, J. F. Pinger, R. R. & Kotecki, J. E. (2005). An introduction to community health. United States: Jones and Bartlett Publishers.
- Misra, G. (Ed). (2010) Psychology in India. Indian Council of Social Science Research. Dorling Kindersley (India) Pvt Ltd. Pearson Education
- Poland, B. D., Green, L.W. & Rootman, I.(2000) Setting for Health Promotion: Linking Theory and Practice, Sage Publication, New Delhi

PAPER- 3:

Generic Elective Course

MEDIA AND COMMUNICATION SKILLS

Course Credits: 4

Learning Outcomes

- develop the professional ability to communicate information clearly and effectively in all kinds of environment and contexts.
- demonstrate practical skills of various types of media writing, reviews, reports,
- programmes and discussions demonstrate their familiarity with the new media, its techniques, practices of socialmedia and hypermedia.
- critically analyze the ways in which the media reflects, represents and influences the contemporary world and identify avenues for a career in print and electronic media.

Course Content

1. **Introduction to Mass Communication**

1. 1Mass Communication and Globalization

2. **Forms of Mass Communication**

Topics for Student Presentations:

a. Case studies on current issues Indian journalism

b. Performing street plays

c. Writing pamphlets and posters, etc.

3. **Advertisement**

1. Types of advertisements

2. Advertising ethics

3. How to create advertisements/storyboards

Topics for Student Presentations: a. Creating an advertisement/visualization b. Enacting an advertisement in a group c. Creating jingles and taglines

4. Media Writing

1. Scriptwriting for TV and Radio

2. Writing News Reports and Editorials

3. Editing for Print and Online Media

Topics for Student Presentations:

a. Script writing for a TV news/panel discussion/radio programme/hosting radio programmes on community radio

b. Writing news reports/book reviews/film reviews/TV program reviews/interviews

c. Editing articles

d. Writing an editorial on a topical subject

5. Introduction to Cyber Media and Social Media

1. Types of Social Media

2. The Impact of Social Media

3. Introduction to Cyber Media

Suggested Readings

Bel, B. et al. Media and Mediation. New Delhi: Sage, 2005.

Bernet, John R, Mass Communication, an Introduction. New Jersey: Prantice Hall, 1989.

Stanley J. Baran and Davis, Mass Communication Theory: Foundations, Ferment and Future. Boston: Wadsworth Cengage Learning, 2012.

John Fiske, Introduction to Communication Studies. London: Routledge, 1982.

Katherine Miller, Communication theories: Perspectives, Processes and Contexts. New York: McGraw Hill, 2004.

Michael Ruffner and Michael Burgoon, Interpersonal Communication. New York & London: Holt, Rinehart and Winston1981.

Kevin Williams, Understanding Media Theory. London & New York: Bloomsbury, 2015.

V.S. Gupta, Communication and Development. New Delhi: Concept Publication, 2000.

Paper -4

Ability Enhancement Compulsory Course

Environment Studies

Course Credits: 4

Learning Outcomes

- Articulate the interconnected and interdisciplinary nature of environmental studies
- Students will develop an understanding of environmental issues
- Students will reflect on their roles ,responsibilities and identities as citizens, consumers and environmental actors in a complex, interconnected world.

Unit 1 : Study of Environment and Ecology

1.1 Introduction to environmental studies

• Multidisciplinary nature of environmental studies;

• Scope and importance; Concept of sustainability and sustainable development.

1.2 Ecology and Ecosystems

- Introduction to Ecology
- What is an ecosystem?

Structure and function of ecosystem;

Energy flow in an ecosystem: food chains, food webs and ecological succession.

Case studies of the following ecosystems :

a) Forest ecosystem b) Grassland ecosystem c) Desert ecosystem d) Aquatic ecosystems (ponds, streams, lakes, rivers, oceans, estuaries)

Unit 2 : Natural Resources : Renewable and Non-renewable Resources

• Land resources and landuse change; Land degradation, soil erosion and desertification.

• Deforestation: Causes and impacts due to mining, dam building on environment, forests, biodiversity and tribal populations.

• Water : Use and over-exploitation of surface and ground water, floods, droughts, conflicts over water (international & inter-state).

• Energy resources : Renewable and non renewable energy sources, use of alternate energy sources, growing energy needs, case studies. (8 lectures)

Unit- 3. Biodiversity and Conservation

• Levels of biological diversity : genetic, species and ecosystem diversity;

Biogeographic zones of India; Biodiversity patterns and global biodiversity hot spots

• India as a mega-biodiversity nation; Endangered and endemic species of India

• Threats to biodiversity : Habitat loss, poaching of wildlife, man-wildlife conflicts, biological invasions; Conservation of biodiversity : In-situ and Ex-situ conservation of biodiversity.

• Ecosystem and biodiversity services: Ecological, economic, social, ethical, aesthetic and Informational value.

Unit 4 : Environmental Pollution, Policies and Practices

4.1 Environmental Pollution

• Environmental pollution : types, causes, effects and controls; Air, water, soil and noise pollution • Nuclear hazards and human health risks

• Solid waste management : Control measures of urban and industrial waste.

• Pollution case studies

4.2 Environmental Policies & Practices

• Climate change, global warming, ozone layer depletion, acid rain and impacts on human communities and agriculture 2/2

• Environment Laws: Environment Protection Act; Air (Prevention & Control of Pollution) Act; Water (Prevention and control of Pollution) Act; Wildlife Protection Act; Forest Conservation Act. International agreements: Montreal and Kyoto protocols and Convention on Biological Diversity (CBD).

• Nature reserves, tribal populations and rights, and human wildlife conflicts in Indian context.

Unit 5 : Human Communities and the Environment

• Human population growth: Impacts on environment, human health and welfare.

• Resettlement and rehabilitation of project affected persons; case studies.

• Disaster management : floods, earthquake, cyclones and landslides.

• Environmental movements : Chipko, Silent valley, Bishnois of Rajasthan.

• Environmental ethics: Role of Indian and other religions and cultures in environmental conservation.

• Environmental communication and public awareness, case studies (e.g., CNG vehicles in Delhi).

Unit 6 : Field work

• Visit to an area to document environmental assets: river/ forest/ flora/fauna, etc.

• Visit to a local polluted site-Urban/Rural/Industrial/Agricultural.

• Study of common plants, insects, birds and basic principles of identification.

• Study of simple ecosystems-pond, river, Delhi Ridge, etc.

Suggested Readings:

1. Carson, R. 2002. Silent Spring. Houghton Mifflin Harcourt.

2. Gadgil, M., & Guha, R. 1993. This Fissured Land: An Ecological History of India. Univ. of California Press.

3. Gleeson, B. and Low, N. (eds.) 1999. Global Ethics and Environment, London, Routledge.

4. Gleick, P. H. 1993. Water in Crisis. Pacific Institute for Studies in Dev., Environment & Security. Stockholm Env. Institute, Oxford Univ. Press.

5. Groom, Martha J., Gary K. Meffe, and Carl Ronald Carroll. Principles of Conservation Biology. Sunderland: Sinauer Associates, 2006.

6. Grumbine, R. Edward, and Pandit, M.K. 2013. Threats from India's Himalaya dams. Science, 339: 36-37.

7. McCully, P. 1996. Rivers no more: the environmental effects of dams (pp. 29-64). Zed Books.

8. McNeill, John R. 2000. Something New Under the Sun: An Environmental History of the Twentieth Century.

9. Odum, E.P., Odum, H.T. & Andrews, J. 1971. Fundamentals of Ecology. Philadelphia: Saunders.

10. Pepper, I.L., Gerba, C.P. & Brusseau, M.L. 2011. Environmental and Pollution Science. Academic Press.

11. Rao, M.N. & Datta, A.K. 1987. Waste Water Treatment. Oxford and IBH Publishing Co. Pvt. Ltd.

12. Raven, P.H., Hassenzahl, D.M. & Berg, L.R. 2012. Environment. 8th edition. John Wiley & Sons.

13. Rosencranz, A., Divan, S., & Noble, M. L. 2001. Environmental law and policy in India. Tripathi 1992.

14. Sengupta, R. 2003. Ecology and economics: An approach to sustainable development. OUP.

15. Singh, J.S., Singh, S.P. and Gupta, S.R. 2014. Ecology, Environmental Science and Conservation. S. Chand Publishing, New Delhi.

16. Sodhi, N.S., Gibson, L. & Raven, P.H. (eds). 2013. Conservation Biology: Voices from the Tropics. John Wiley & Sons.

17. Thapar, V. 1998. Land of the Tiger: A Natural History of the Indian Subcontinent.

18. Warren, C. E. 1971. Biology and Water Pollution Control. WB Saunders.

19. Wilson, E. O. 2006. The Creation: An appeal to save life on earth. New York: Norton.

20. World Commission on Environment and Development. 1987. Our Common Future. Oxford University Press

AWADHESH PRATAP SINGH UNIVERSITY, REWA (M.P.)

Syllabus

B.A. Course

PHILOSOPHY

Scheme of Examination / ijh{kk ;kstuk

B.A. (Hons.) Philosophy / ch-,- n'kZu'kkL=

Semester - I

Sr. No.	Paper Name	Paper No.	Scheme of Marks				Total
			Theory	Min.	Sessional	Min.	
1.	**Foundation Course** **Paper Name -** Hindi Bhasha (हिन्दी भाषा)	**FC-I**	**70**	**25**	**30**	**11**	**100**
2.	**Philosophy (Hons.) Course** **Paper Name -** Indian Philosophy - I (भारतीय दर्शन–I)	**H-I**	**70**	**25**	**30**	**11**	**100**
3.	**Philosophy (Hons.) Course** **Paper Name -** Western Philosophy-I (पाश्चात्य दर्शन –I)	**H-II**	**70**	**25**	**30**	**11**	**100**
4.	**Ancient Indian History, Culture & Archaeology (Subsidiary) Course** **Paper Name -** Ancient Indian History (प्राचीन भारतीय इतिहास)	**S-I**	**70**	**25**	**30**	**11**	**100**

Semester - II

Sr. No.	Paper & Paper Name	Paper No.	Scheme of Marks				Total
			Theory	Min.	Sessional	Min.	
1.	**Foundation Course** **Paper Name -** English Language	**FC-II**	**70**	**25**	**30**	**11**	**100**
2.	**Philosophy (Hons.) Course** **Paper Name -** Indian Philosophy -II (भारतीय दर्शन–II)	**H-III**	**70**	**25**	**30**	**11**	**100**
3.	**Philosophy (Hons.) Course** **Paper Name -** Western Philosophy-II (पाश्चात्य दर्शन –II)	**H-IV**	**70**	**25**	**30**	**11**	**100**
4.	**Ancient Indian History, Culture & Archaeology (Subsidiary) Course** **Paper Name -** Fundamentals of Ancient Archaeology (प्राचीन पुरातत्त्व के मूल तत्व)	**S-II**	**70**	**25**	**30**	**11**	**100**

Semester - III

Sr. No.	Paper & Paper Name	Paper No.	Scheme of Marks				Total
			Theory	Min.	Sessional	Min.	
1.	**Foundation Course** **Paper Name -** Environmental Studies (पर्यावरण अध्ययन)	**FC-III**	**70**	**25**	**30**	**11**	**100**
2.	**Philosophy (Hons.) Course** **Paper Name -** Philosophy of Religion - I (धर्म–दर्शन – I)	**H-V**	**70**	**25**	**30**	**11**	**100**
3.	**Philosophy (Hons.) Course** **Paper Name -** Logic (तर्कशास्त्र)	**H-VI**	**70**	**25**	**30**	**11**	**100**
4.	**Ancient Indian History, Culture & Archaeology (Subsidiary) Course** **Paper Name -** Ancient Indian Culture (प्राचीन भारतीय संस्कृति)	**S-III**	**70**	**25**	**30**	**11**	**100**

Semester - IV

Sr. No.	Paper & Paper Name	Paper No.	Scheme of Marks				Total
			Theory	Min.	Sessional	Min.	
1.	**Foundation Course** **Paper Name -** Basic of Computer and Information Technology (कम्प्यूटर एवं सूचना तकनीकी के आधार)	**FC-IV**	**70**	**25**	**30**	**11**	**100**
2.	**Philosophy (Hons.) Course** **Paper Name -** Philosophy of Religion-II (धर्म–दर्शन–II)	**H-VII**	**70**	**25**	**30**	**11**	**100**
3.	**Philosophy (Hons.) Course** **Paper Name -** Social - Philosophy (समाज –दर्शन)	**H-VIII**	**70**	**25**	**30**	**11**	**100**
4.	**Ancient Indian History, Culture & Archaeology (Subsidiary) Course** **Paper Name -** Ancient Indian Religion and Philosophy (प्राचीन भारतीय धर्म एवं दर्शन)	**S-IV**	**70**	**25**	**30**	**11**	**100**

Semester - V

Sr. No.	Paper & Paper Name	Paper No.	Scheme of Marks				Total
			Theory	Min.	Sessional	Min.	
1.	**Philosophy (Hons.) Course** **Paper Name -** Contemporary Indian Philosophy (समकालीन भारतीय दर्शन)	**H-IX**	**70**	**25**	**30**	**11**	**100**
2.	**Philosophy (Hons.) Course** **Paper Name -** Contemporary Western Philosophy (समकालीन पाश्चात्य दर्शन)	**H-X**	**70**	**25**	**30**	**11**	**100**
3.	**Philosophy (Hons.) Course** **Paper Name -** Ethics (नीतिशास्त्र)	**H-XI**	**70**	**25**	**30**	**11**	**100**
4.	**Project / परियोजना**	**H-XII**	100	36	-	-	**100**

Semester - VI

Sr. No.	Paper & Paper Name	Paper No.	Scheme of Marks				Total
			Theory	Min.	Sessional	Min.	
1.	**Philosophy (Hons.) Course** **Paper Name -**Yoga Darshan (योग दर्शन)	**H-XIII**	**70**	**25**	**30**	**11**	**100**
2.	**Philosophy (Hons.) Course** **Paper Name -**Indian Religion (भारतीय धर्म)	**H-XIV**	**70**	**25**	**30**	**11**	**100**
3.	**Philosophy (Hons.) Course** **Paper Name -** Vedanta (वेदान्त)	**H-XV**	**70**	**25**	**30**	**11**	**100**
4.	**Comprehensive Viva / विशद् मौखिकी**	**H-XVI**	100	36	-	-	**100**

B.A. (Hons.) Philosophy / बी.ए. (ऑनर्स) दर्शनशास्त्र

Semester - I / सेमेस्टर–I

Paper -H-I

Max. Marks - 70
Min. Marks - 25

Indian Philosophy-I / भारतीय दर्शन–I

Unit I / इकाई I

Nature of Darśana, Distinction between Darśana and Philosophy, Classification of Indian Philosophy, Characteristics of Indian Philosophy.
दर्शन का स्वरूप, दर्शन एवं फिलॉसफी में भेद, भारतीय दर्शन का वर्गीकरण, भारतीय दर्शन की विशेषताएँ।

Unit II / इकाई II

Introduction to the Vedas. Upanishads Brahman and Ātman, Bhagavadgītā: Jñānayoga, Karmayoga and Bhaktiyoga.
वेद–परिचय, उपनिषद्– ब्रह्म एवं आत्मा, भगवद्गीता–ज्ञानयोग, कर्मयोग और भक्तियोग।

Unit III / इकाई III

Lokāyata- Metaphysics, Epistemology and Ethics.
लोकायत – तत्त्वमीमांसा, ज्ञानमीमांसा एवं नीतिमीमांसा।

Unit IV / इकाई IV

Jainism: Anekāntavāda, Syādavāda, Kaivalya.
जैन दर्शन– अनेकान्तवाद, स्याद्वाद, कैवल्य।

Unit V / इकाई V

Buddhism - Four Noble Truths, Anātmavāda (No-soul theory), Theory of Momentariness.
बौद्ध दर्शन – चार आर्य सत्य, अनात्मवाद, क्षणिकवाद।

Suggested Readings :

1. डॉ. चन्द्रधर शर्मा, भारतीय दर्शन अलोचन और अनुशीलन, मोतीलाल बनारसीदास, दिल्ली 1995
2. डॉ. बी.एन. सिंह एवं डॉ. आशा सिंह, भारतीय दर्शन, स्टूडेण्ट्स फ्रेण्ड्स एण्ड कम्पनी, काशी हिन्दू विश्वविद्यालय मार्ग लंका, वाराणसी–5, 1996
3. प्रो. हरेन्द्र प्रसाद सिन्हा, भारतीय दर्शन की रूपरेखा, मोतीलाल बनारसीदास, दिल्ली, 1963
4. बलदेव उपाध्याय, भारतीय दर्शन, शारदा मन्दिर वाराणसी, 1997
5. नन्द किशोर देवराज, भारतीय दर्शन, उत्तर प्रदेश हिन्दी ग्रन्थ अकादमी, लखनऊ, 1975
6. Dutta & Chatterjee, An Introduction to Indian Philosophy, University of Calcutta, 1968.
7. M. Hiriyanna, Outlines of Indian Philosophy, George Allen and Unwin, Lodon-1932.

B.A. (Hons.) Philosophy / बी.ए. (ऑनर्स) दर्शनशास्त्र

Semester - I / सेमेस्टर–I

Paper - H-II

Max. Marks - 70
Min. Marks - 25

Western Philosophy-I / पाश्चात्य दर्शन–I

UNIT-I / इकाई -I

Nature of Western Philosophy, Greek Philosophy - The ultimate principles in Ionic and Pythagorean schools.
पाश्चात्य दर्शन का स्वरूप, ग्रीक दर्शन – आयोनिक एवं पाइथागोरस सम्प्रदाय में परम तत्त्व का सिद्धान्त।

UNIT-II / इकाई -II

Being in Eleatic School, Heraclites - Doctrine of Becoming, Empedocles - Doctrine of Elements, Anaxagoras - Doctrine of Nous, Atomic theories of Leucippus and Democritus, Main principles of Sophists.
इलिएटिक सम्प्रदाय में सत्ता, हेरेक्लाइटस – परिणाम का सिद्धान्त, एम्पेडोक्लीज – तत्त्व का सिद्धान्त, एनेक्जेगोरस – परम विज्ञान का सिद्धान्त, ल्यूसिपस और डिमॉक्रिटस का परमाणु सिद्धान्त, सोफिस्ट सम्प्रदाय के प्रमुख नियम।

UNIT-III / इकाई -III

The Socratic Method, Plato's Theory of Knowledge, Doctrine of Ideas.
सुकरातीय पद्धति, प्लेटो का ज्ञान सिद्धान्त, विज्ञानवाद।

UNIT-IV / इकाई -IV

Aristotle - Criticism of Theory of Ideas, Causality, Matter and form.
अरस्तू – विज्ञानवाद की आलोचना, कारणता सिद्धान्त, द्रव्य एवं आकार।

UNIT-V / इकाई -V

St. Augustine - Theory of Knowledge, The Problem of Evil, Thomas Aquinas's view of God, Distinction between Faith and Reason.
संत ऑगस्टाइन – ज्ञान सिद्धान्त, अशुभ की समस्या, थॉमस एक्वीनस का ईश्वर विचार, आस्था एवं तर्क में भेद।

Suggested Readings

1. चन्द्रधर शर्मा, पाश्चात्य दर्शन, मोतीलाल बनारसीदास, दिल्ली, 1997
2. डॉ. बी.एन. सिंह, पाश्चात्य दर्शन, स्टूण्डेट्स फ्रेण्ड्स एण्ड कम्पनी, वाराणसी, 1973
3. याकूब मसीह, पाश्चात्य दर्शन का समीक्षात्मक इतिहास, मोतीलाल बनारसीदास, नई दिल्ली, 2005
4. जगदीश सहाय श्रीवास्तव, आधुनिक पाश्चात्य दर्शन का वैज्ञानिक इतिहास, पुस्तक स्थान, गोरखपुर, 1973
5. Will Durant, A story of Philosophy, Simon & Schuster, 1926 & Pocket Books, New York, 2006
6. Bertand Russell, A History of Western Philosophy, Union paper Backs, London, 1987
7. Frank Thilly, History of Western Philosophy, Central Book Depot, Allahabad, 1975
8. W.T Stace, .: A Critical History of Greek Philosophy Macmillan, New Delhi, 1985
9. Y. Masih, - A Critical History of Western Philosophy, Motilal Banarasidas, Delhi, 1994

B.A. (Hons.) Philosophy / बी.ए. (ऑनर्स) दर्शनशास्त्र

Semester - II / सेमेस्टर–II

Paper -H-III

Max. Marks - 70
Min. Marks - 25

Indian Philosophy-II / भारतीय दर्शन–II

UNIT-I / इकाई -I

Sāṅkhya - Satkāryavāda, Puruṣa, Prakriti, Theory of Evolution, Kaivalya.
सांख्य – सत्कार्यवाद, पुरूष, प्रकृति, विकासवाद के सिद्धान्त, कैवल्य।

UNIT-II / इकाई -II

Nyāya - Pramānas - Pratyaksha, Anuman, Shabda, Upamana, Proofs for the Existence of God.
न्याय – प्रमाण – प्रत्यक्ष, अनुमान, शब्द, उपमान, ईश्वर की सत्ता सिद्धि हेतु तर्क।

UNIT-III / इकाई -III

Vaiśeshika: Padārthas, Atomism, Mīmāmsā - Dharma, Apūrva.
वैशेषिक – पदार्थ, परमाणुवाद, मीमांसा – धर्म, अपूर्व।

UNIT-IV / इकाई -IV

Advaita Vedānta: Brahman, Māyā, Mukti.
अद्वैतवेदान्त – ब्रह्म, माया, मुक्ति।

UNIT-V / इकाई -V

Viśiṣṭādvaita - Brahman, Mukti, Satkhyativada.
विशिष्टाद्वैत – ब्रह्म, मुक्ति, सत्ख्यातिवाद्।

Suggested Readings :

1. डॉ. चन्द्रधर शर्मा, भारतीय दर्शन अलोचन और अनुशीलन, मोतीलाल बनारसीदास, दिल्ली 1995
2. डॉ. बी.एन. सिंह एवं डॉ. आशा सिंह, भारतीय दर्शन, स्टूडेण्ट्स फ्रेण्ड्स एण्ड कम्पनी, काशी हिन्दू विश्वविद्यालय मार्ग लंका, वाराणसी–5, 1996
3. प्रो. हरेन्द्र प्रसाद सिन्हा, भारतीय दर्शन की रूपरेखा, मोतीलाल बनारसीदास, दिल्ली, 1963
4. बलदेव उपाध्याय, भारतीय दर्शन, शारदा मन्दिर वाराणसी, 1997
5. नन्द किशोर देवराज, भारतीय दर्शन, उत्तर प्रदेश हिन्दी ग्रन्थ अकादमी, लखनऊ, 1975
6. Dutta & Chatterjee, An Introduction to Indian Philosophy, University of Calcutta, 1968
7. M. Hiriyanna, Outlines of Indian Philosophy, George Allen and Unwin, Lodon-1932

B.A. (Hons.) Philosophy / बी.ए. (ऑनर्स) दर्शनशास्त्र

Semester - II / सेमेस्टर–II

Paper -H-IV

Max. Marks - 70
Min. Marks - 25

Western Philosophy - II / पाश्चात्य दर्शन–II

UNIT-I / इकाई -I

Descartes - concept of substance, Method of doubt, Cogito Ergo sum, Mind-Body Problem. Spinoza - Refutation of Descartes conception of Substance, Concept of Substance, Attribute and Mode, Pantheism.
देकार्त – द्रव्य की अवधारणा, सन्देह पद्धति, मैं सोचता हूँ, इसलिए मैं हूँ, मन–शरीर की समस्या, स्पिनोजा – देकार्त के द्रव्य की अवधारणा का खण्डन, द्रव्य की अवधारणा, गुण और पर्याय, सर्वेश्वरवाद।

UNIT-II / इकाई -II

Leibnit - Theory of Monads, Pre-Established Harmony, John Locke - Refutation of Innate Ideas, Substance, Primary and Secondary Qualities.
लाइब्नीत्ज – चिदणुवाद, पूर्वस्थापित सामंजस्य का सिद्धान्त, जॉन लॉक – जन्मजात प्रत्ययों का खण्डन, द्रव्य, मूल गुण एवं उपगुण।

UNIT-III / इकाई -III

George Berkeley - Refutation of Materialism, Esse Est Percipi and Subjective Idealism.
जॉर्ज बर्कले – जड़ द्रव्य का खण्डन, सत्ता अनुभवमूलक है, आत्मनिष्ठ प्रत्ययवाद।

UNIT-IV / इकाई -IV

David Hume - Culmination of Empiricism, Refutation of Metaphysical Entities and Causality, Skepticism.
डेविड ह्यूम – अनुभववाद की पराकाष्ठा, तत्त्विक सत्ताओं एवं कारणता का खण्डन, संदेहवाद।

UNIT-V / इकाई -V

Immanual Kant - Criticism, Space and Time, Hegel - Dialectic Method, Absolute.
इमान्युएल कान्ट – समीक्षावाद, देश और काल, हेगल – द्वन्द्वात्मक तर्क, परमतत्त्व।

Suggested Readings

1. चन्द्रधर शर्मा, पाश्चात्य दर्शन, मोतीलाल बनारसीदास, दिल्ली, 1997
2. डॉ. बी.एन. सिंह, पाश्चात्य दर्शन, स्टूण्डेट्स फ्रेण्ड्स एण्ड कम्पनी, वाराणसी, 1973
3. याकूब मसीह, पाश्चात्य दर्शन का समीक्षात्मक इतिहास, मोतीलाल बनारसीदास, नई दिल्ली, 2005
4. जगदीश सहाय श्रीवास्तव, आधुनिक पाश्चात्य दर्शन का वैज्ञानिक इतिहास, पुस्तक स्थान, गोरखपुर, 1973
5. Frank Thilly, History of Western Philosophy, Central Book Depot, Allahabad, 1975
6. Stace, W.T.: A Critical History of Greek Philosophy Macmillan, New Delhi, 1985
7. Masih, Y. - A Critical History of Western Philosophy, Motilal Banarasidas, Delhi, 1994

B.A. (Hons.) Philosophy / बी.ए. (ऑनर्स) दर्शनशास्त्र

Semester - III / सेमेस्टर–III

Paper - H-V

Max. Marks - 70
Min. Marks - 25

Philosophy of Religion -I / धर्म–दर्शन -I

UNIT-I / इकाई -I

Nature and scope of Philosophy of Religion, Concept of Religion, Concept of Philosophy.
धर्म दर्शन का स्वरूप और क्षेत्र, धर्म की अवधारणा, दर्शन की अवधारणा।

UNIT-II / इकाई -II

Relationship between Religion and Philosophy, Religion and Magic, Religion and morality, Religion and science.
धर्म और दर्शन में सम्बन्ध, धर्म एवं जादू, धर्म एवं नैतिकता, धर्म एवं विज्ञान।

UNIT-III / इकाई -III

Concept of God, Theism, Deism, Pantheism.
ईश्वर की अवधारणा, ईश्वरवाद, केवलनिमित्तेश्वरवाद, सर्वेश्वरवाद।

UNIT-IV / इकाई -IV

Polytheism, Monotheism, God and Absolute.
अनेकेश्वरवाद, एकेश्वरवाद, ईश्वर एवं परमतत्त्व,

UNIT-V / इकाई -V

The arguments to prove the existence of God - Ontological, Cosmological, Teleological and Moral arguments.
ईश्वर की सत्ता सिद्धि हेतु प्रमाण – सत्तामूलक, विश्वमूलक, प्रयोजनमूलक और नैतिक तर्क।

Suggested Readings:

1. हृदय नारायण मिश्र, धर्म दर्शन परिचय, शेखर प्रकाशन, इलाहाबाद, 2000
2. या. मसीह, धर्म दर्शन प्राच्य व पाश्चात्य, मोतीलाल बनारसीदास, पटना, 1973
3. डॉ. हरेन्द्र प्रसाद सिन्हा, धर्म–दर्शन की रूप–रेखा, मोतीलाल बनारसीदास, 1962
4. D.M. Edwards, Philosophy of Religion, Progressive publisher, Calcutta, 1968
5. John Caird, An Introduction to the Philosophy of Religion, Chatterjee and Co., Calcutta, 1956
6. S.N. Dasgupta, Religions and The Rational outlook, Motilal Banarasidass, Delhi, 1974.

B.A. (Hons.) Philosophy / बी.ए. (ऑनर्स) दर्शनशास्त्र

Semester - III / सेमेस्टर–III

Paper -H-VI

Max. Marks - 70
Min. Marks - 25

Logic / तर्कशास्त्र

UNIT-I / इकाई -I

Nature of Logic, Propositions, Induction and Deduction, Truth and Validity.
तर्कशास्त्र का स्वरूप, तर्कवाक्य, निगमन और आगमन, सत्यता एवं वैधता।

UNIT-II / इकाई -II

Categorical Propositions and Classes, Quality, Quantity and Distribution of Terms, Traditional Square of Opposition, Immediate Inference.
निरूपाधिक तर्कवाक्य और वर्ग, गुण, परिमाण एवं पदों की व्याप्ति, परम्परागत विरोध वर्ग, अव्यवहित अनुमान।

UNIT-III / इकाई -III

Standard form of Categorical Syllogism, Venn-Diagram Technique for Testing Syllogism, Rules and Fallacies.
निरूपाधिक न्याय वाक्य का मानक रूप, न्याय वाक्य के परीक्षण हेतु वेन आरेख पद्धति, नियम और दोष।

UNIT-IV/ इकाई -IV

Symbolic Logic, Testing arguments by Truth Table Method, Relation between Truth functions.
प्रतीकात्मक तर्कशास्त्र, सत्यता सारणी विधि द्वारा युक्तियों का परीक्षण, सत्यता फलनों के बीच सम्बन्ध।

UNIT-V / इकाई -V

Inductive Reasoning and Probability, Simple Enumeration and Analogy. Mill's Inductive Methods.
आगमनात्मक तर्क और सम्भाव्यता, सरल गणना और साम्यानुमान, मिल की आगमनात्मक विधियाँ।

Suggested Readings

1. श्यामकिशोर सेठ एवं नीलिमा मिश्र, तर्कशास्त्र, लोक भारती, इलाहाबाद, 2004
2. कोपी एवं कोहेन, तर्कशास्त्र : एक परिचय, Introduction to Logic का हिन्दी अनुवाद, संगम लाल पाण्डेय एवं गोरखनाथ मिश्र, एशिया बुक कम्पनी, इलाहाबाद, 2002
3. राज्यश्री अग्रवाल, तर्कशास्त्र, मध्यप्रदेश हिन्दी ग्रन्थ अकादमी, भोपाल,
4. Copi & Cohen : Introduction to Logic, 11th Edition, Pearson Education Inc, 2002
5. Cohen and Nagel : Introduction to Logic & Scientific Method, Allied Publishers Ltd., New Delhi, 1990

B.A. (Hons.) Philosophy / बी.ए. (ऑनर्स) दर्शनशास्त्र

Semester - IV / सेमेस्टर–IV

Paper -H-VII

Max. Marks - 70
Min. Marks - 25

Philosophy of Religion - II / धर्म–दर्शन - II

UNIT-I / इकाई -I

Nature of Religious knowledge, Nature of Religious Faith, An Introduction of Religious Language.
धार्मिक ज्ञान का स्वरूप, धार्मिक विश्वास का स्वरूप, धार्मिक भाषा का परिचय।

UNIT-II / इकाई -II

Faith, Reason, Revelation and its Validity, Mystic Experience.
आस्था, तर्क, दैवीय प्रकाशना और इनकी वैधता, रहस्यानुभूति।

UNIT-III / इकाई -III

Nature and Kinds of Evil, The Problem of Evil and its Solution.
अशुभ का स्वरूप एवं प्रकार, अशुभ की समस्या एवं इसका समाधान।

UNIT-IV / इकाई -IV

Mysticism and its Characteristics, Nature of Religious Tolerance, Nature of Conversion.
रहस्यवाद एवं उसकी विशेषताएँ, धार्मिक सहिष्णुता का स्वरूप, धर्म परिवर्तन का स्वरूप।

UNIT-V / इकाई -V

Nature of Immortality, Proof of Immortality, Kinds of Immortality, Arguments against Immortality.
अमरत्व का स्वरूप, अमरत्व के प्रमाण, अमरत्व के प्रकार, अमरत्व के विरूद्ध युक्तियाँ।

Suggested Readings

1. हृदय नारायण मिश्र, धर्म दर्शन परिचय, शेखर प्रकाशन, इलाहाबाद, 2000
2. या. मसीह, धर्म दर्शन प्राच्य व पाश्चात्य, मोतीलाल बनारसीदास, पटना, 1973
3. डॉ. हरेन्द्र प्रसाद सिन्हा, धर्म–दर्शन की रूप–रेखा, मोतीलाल बनारसीदास, 1962
4. D.M. Edwards, Philosophy of Religion, Progressive publisher, Calcutta, 1968
5. John Caird, An Introduction to the Philosophy of Religion, Chatterjee and Co., Calcutta, 1956
6. S.N. Dasgupta, Religions and The Rational outlook, Motilal Banarasidass, Delhi, 1974.

B.A. (Hons.) Philosophy / बी.ए. (ऑनर्स) दर्शनशास्त्र

Semester - IV / सेमेस्टर–IV

Paper -H-VIII

Max. Marks - 70
Min. Marks - 25

Social Philosophy / समाज–दर्शन

UNIT-I / इकाई -I

Nature and scope of social Philosophy, Relationship between Social Philosophy and Philosophy, Relationship between Social Philosophy and Political Philosophy.
समाज दर्शन का स्वरूप एवं क्षेत्र, समाज दर्शन एवं दर्शनशास्त्र का सम्बन्ध, समाज दर्शन एवं राजदर्शन का सम्बन्ध।

UNIT-II / इकाई -II

Definition and origin of Society - The theory of Social contract, Divine origin Theory, Patriarchal Theory, Matriarchal Theory and Evolution Theory.
समाज की परिभाषा एवं उत्पत्ति – सामाजिक अनुबंध का सिद्धान्त, दैवीय उत्पत्ति का सिद्धान्त, पैतृक सिद्धान्त, मातृक सिद्धान्त और विकासवादी सिद्धान्त।

UNIT-III / इकाई -III

Social Institutions - Family, Marriage and Religion, Kautilya - Origin and Nature of State, Theory of Saptanga.
सामाजिक संस्थाएँ – परिवार, विवाह और धर्म, कौटिल्य – राज्य की उत्पत्ति एवं स्वरूप, सप्तांग सिद्धान्त।

UNIT-IV / इकाई -IV

Mahatma Gandhi - Sarvodaya, Satyagrah, Concept of Ramrajya, Varnavyavastha, Doctrine of Trusteeship.
महात्मा गाँधी – सर्वोदय, सत्याग्रह, रामराज्य की अवधारणा, वर्णव्यवस्था, न्यास का सिद्धान्त।

UNIT-V / इकाई -V

Dr. B.R. Ambedkar - Social thought, Neo-Buddhism. Pt. Jawaharlal Nehru - Humanism, Socialism, Secularism.
डॉ. बी.आर. अम्बेडकर – सामाजिक चिन्तन, नव–बौद्धवाद, पं. जवाहरलाल नेहरू – मानववाद, समाजवाद, धर्मनिरपेक्षतावाद।

Suggested Readings

1. बसन्त कुमार लाल, समकालीन भारतीय दर्शन, मोतीलाल बनारसीदास, दिल्ली, 1963
2. डॉ. ए. अवस्थी एवं डॉ. आर.के. अवस्थी, भारतीय राजनीतिक चिन्तन, रिसर्च पब्लिकेशन्स, जयपुर,
3. डॉ. जगदीशसहाय श्रीवास्तव, समाज–दर्शन की भूमिका, विश्वविद्यालय प्रकाशन, वाराणसी, 1999
4. डॉ. हृदय नारायण मिश्र, समाज दर्शन सैद्धांतिक एवं समस्यात्मक विवेचन, शेखर प्रकाशन, इलाहाबाद, 2003
5. बी.एन. सिंह, समाज दर्शन एवं राजनीति दर्शन, आशा प्रकाशन, वाराणसी, 1990
6. Krishna Saya, Social Philosophy: Past and Future, Indian Institute of Advanced Studies, 1978.

B.A. (Hons.) Philosophy / बी.ए. (ऑनर्स) दर्शनशास्त्र

Semester - V / सेमेस्टर–V

Paper - H-IX

Max. Marks - 70
Min. Marks - 25

Contemporary Indian Philosophy / समकालीन भारतीय दर्शन

UNIT-I / इकाई -I

Characteristics of Contemporary Indian Philosophy, Swami Vivekananada - God, Māyā, Spirit, Liberation.
समकालीन भारतीय दर्शन की विशेषताएँ, स्वामी विवेकानन्द – ईश्वर, माया, आत्मा, मोक्ष।

UNIT-II / इकाई -II

R.N. Tagore - Reality, Māyā, Soul, Humanism, Problem of Evil.
रबीन्द्रनाथ टैगोर – सत्, माया, आत्मा, मानववाद, अशुभ की समस्या।

UNIT-III / इकाई -III

Mahatma Gandhi - Truth, Non-violence, Means and End, Decentralisation.
महात्मा गाँधी – सत्य, अहिंसा, साधन और साध्य, विकेन्द्रीकरण।

UNIT-IV / इकाई -IV

Sri Aurobindo - Absolute, Supermind, Involution, Evolution, Integral Yoga .
श्री अरविन्द – परमतत्त्व, अतिमानस, अवतरण, विकासवाद, समग्रयोग।

UNIT-V / इकाई -V

Acharya Vinoba Bhave - Life Sketch, Sarvodaya, Bhoodan movement.
आचार्य विनोबा भावे – जीवन परिचय, सर्वोदय, भूदान आन्दोलन।

Suggested Readings:

1. उमेश चन्द्र दुबे, श्री अरविन्द एवं ब्रेडले का परमतत्त्ववाद, नन्द किशोर एण्ड ब्रदर्स, वाराणसी।
2. लक्ष्मी सक्सेना, समकालीन भारतीय द र्शन, उत्तर प्रदे श हिन्दी ग्रन्थ अकादमी, लखनऊ, 1974
3. डी.ए. गंगाधर, सर्वेपल्लि राधाकृष्णन् का धर्म एवं दर्शन, कला प्रकाशन, वाराणसी।
4. बी.के. लाल, समकालीन भारतीय दर्शन, मोतीलाल बनारसीदास, दिल्ली 2009
5. V.S. Narvane, Modern Indian Thought (Hindi & English), Asia Publishing House, Bombay, 1964.
6. R.S. Srivastava, Contemporary Indian Philosophy, Munshi Ram Manohar Lal, Delhi, 1965.

B.A. (Hons.) Philosophy / बी.ए. (ऑनर्स) दर्शनशास्त्र

Semester - V / सेमेस्टर–V

Paper -H-X

Max. Marks - 70
Min. Marks - 25

Contemporary Western Philosophy / समकालीन पाश्चात्य दर्शन

UNIT-I / इकाई -I

F. H. Bradley - Appearance, Primary and Secondary Qualities, Substantive and Adjective, Relation and Quality, Causation, Appearance and Reality.
एफ.एच. ब्रेडले – आभास, प्राथमिक और गौण गुण, द्रव्यता एवं विशेषणता, सम्बन्ध और गुण, कारणता, आभास एवं सत्।

UNIT-II / इकाई -II

Pragmatism - C.S. Pierce's theory of meaning, William James' Radical Empiricism, Conception of Reality and Theory of Truth, John Dewey's Instrumentalism.
उपयोगितावाद – सी.एस. पर्स का अर्थ सिद्धान्त, विलियम जेम्स – उत्कट अनुभववाद, सत्ता–विचार एवं सत्यता–सिद्धान्त, जॉन डिवी का उपकरणवाद।

UNIT-III / इकाई -III

Marxism - Dialectical Materialism, Theory of Value (Labour Theory of Value and Theory of Surplus Value), Class-Conflict, Communism,
मार्क्सवाद – द्वन्दात्मक भौतिकवाद, मूल्य का सिद्धान्त, (मूल्य का श्रम सिद्धान्त और अतिरिक्त मूल्य का सिद्धान्त), वर्ग–संघर्ष, साम्यवाद।

UNIT-IV / इकाई -IV

Bertrand Russell - Logical Atomism, Theory of Description, Theory of Types.
बर्टेंड रसेल – तार्किक अणुवाद, विवरण का सिद्धान्त, प्रारूप सिद्धान्त।

UNIT-V / इकाई -V

Introduction of Existentialism, Jean Paul Sartre - Existence Precedes Essence, Bad Faith.
अस्तित्ववाद का परिचय, जां पाल सार्त्र – अस्तित्व भाव से पहले है, आत्म–प्रवंचना।

Suggested Readings

1. बी.के. लाल, समकालीन पाश्चात्य दर्शन, मोतीलाल बनारसीदास, दिल्ली 2009
2. लक्ष्मी सक्सेना, समकालीन पाश्चात्य दर्शन, उत्तर प्रदेश हिन्दी संस्थान, लखनऊ, 1991
3. नित्यानन्द मिश्र, समकालीन पाश्चात्य दर्शन, मोतीलाल बनारसीदास, दिल्ली, 2006
4. Dutta, D. M., Chief currents of contemporary Philosophy, The University of Calcutta, 1970
5. Pass more, J., Hundred years of philosophy (Hindi Translation by C.M. Sharma), Hindi Prakashan Vibhaga Rajasthan Vishwavidyalay, Jaipur, 1966
6. F.H., Bradely, Appearance and Reality, Oxford University Press, Oxford, London, New York, 1969

B.A. (Hons.) Philosophy / बी.ए. (ऑनर्स) दर्शनशास्त्र

Semester - V / सेमेस्टर–V

Paper -H-XI

Max. Marks - 70
Min. Marks - 25

Ethics / नीतिशास्त्र

UNIT-I / इकाई -I

Nature and scope of Ethics. Ethical Concepts - Good, Right, Duty, Value, Postulates of Morality, Nature of Moral Judgment.
नीतिशास्त्र का स्वरूप और क्षेत्र, नैतिक अवधारणा – शुभ, उचित, कतर्व्य, मूल्य, नैतिकता की पूर्व मान्यताएँ, नैतिक निर्णय का स्वरूप।

UNIT-II / इकाई -II

Psychological and Ethical Hedonism, Utilitarianism of Bentham and J.S. Mill.
मनोवैज्ञानिक और नैतिक सुखवाद, बेन्थम और जे.एस. मिल का उपयोगितावाद।

UNIT-III / इकाई -III

Perfectionism, Kant's moral Law and Good will.
पूर्णतावाद, काण्ट का नैतिक नियम और शुभ संकल्प।

UNIT-IV / इकाई -IV

Reward and punishment, Theory of Punishment - Retributive, Detterent, Reformative, Idealistic.
पुरस्कार एवं दण्ड, दण्ड के सिद्धान्त – प्रतिफलनात्मक, प्रतिरोधात्मक, सुधारात्मक, आदर्शवादी।

UNIT-V / इकाई -V

Conception of Purusārtha - Dharma, Artha, Kama and Moksha,Vedic Concept of Rita And Rina.
पुरषार्थ की अवधारणा – धर्म, अर्थ, काम और मोक्ष, ऋत और ऋण की वैदिक अवधारणा।

Suggested Readings

1. डॉ. नित्यानंद मिश्र, नीति ाास्त्र (सिद्धान्त तथा प्रयोग), मोतीलाल बनारसीदास, दिल्ली, 2005
2. डॉ. वेद प्रका ा वर्मा, नीति ाास्त्र के मूल सिद्धान्त, एलाइड पब्लिकेशन, दिल्ली, 1977
3. डॉ. अ ाोक कुमार वर्मा, नीति ाास्त्र के सिद्धान्त, मोतीलाल बनारसीदास, दिल्ली, 1977
4. संगमलाल पाण्डेय, नीति ाास्त्र का सर्वेक्षण, सेन्ट्रल पब्लि िंग हाऊस, इलाहाबाद, 2005
5. डॉ. दिवाकर पाठक, भारतीय नीति ाास्त्र, बिहार हिन्दी ग्रन्थ अकादमी, पटना, 1974
6. S.K. Maitra, Ethics of Hindus, University of Calcutta, 1978

B.A. (Hons.) Philosophy / बी.ए. (ऑनर्स) दर्शनशास्त्र

Semester - V / सेमेस्टर–V

Paper - H - XII

Max. Marks - 100
Min. Marks - 36

Project / परियोजना

The Project will be based on the Syllabi of Philosophy Included in Five Semester of B.A. (Hons.) Philosophy.
बी.ए. (ऑनर्स) दर्शनशास्त्र के पॉच सेमेस्टर में निर्धारित पाठ्यक्रम पर परियोजना कार्य आधारित होगा।

B.A. (Hons.) Philosophy / बी.ए. (ऑनर्स) दर्शनशास्त्र

Semester - VI / सेमेस्टर–VI

Paper -H-XIII

Max. Marks - 70
Min. Marks - 25

Yoga -Darśana / योग–दर्शन

UNIT-I / इकाई -I

Meaning of Yoga, Nature of Citta, Cittabhumi - Kshipta, Moodha, Vikshipta, Ekagra, Niruddha.
योग का अर्थ, चित्त का स्वरूप, चित्तभूमियाँ– क्षिप्त, मूढ़, विक्षिप्त, एकाग्र, निरूद्ध।

UNIT-II / इकाई -II

Nature and Forms of Cittavṛttis - Pramana, Viparyaya, Vikalpa, Nidra, Smriti.
चित्तवृत्ति का स्वरूप एवं प्रकार – प्रमाण, विपर्यय, विकल्प, निद्रा, स्मृति।

UNIT-III / इकाई -III

Method of Cittavrttinirodha - Abhyāsa-Vairāgya, Kriyāyoga, Nature and Kinds of Samadhi.
चित्तवृत्तिनिरोध के उपाय – अभ्यास–वैराग्य, क्रिया–योग, समाधि का स्वरूप एवं प्रकार।

UNIT-IV / इकाई -IV

Eight Fold Yoga (Astāngayoga) - Yama, Niyama, Asana, Pranayama, Pratyahar, Dharana, Dhyan, Samadhi.
अष्टांग–योग – यम, नियम, आसन, प्राणायाम, प्रत्याहार, धारणा, ध्यान, समाधि।

UNIT-V / इकाई -V

Nature and kinds of Kleśa - Avidya, Raga, Dvesha, Asmita, Abhinivesha, Nature of God, Kaivalya.
क्लेश का स्वरूप एवं प्रकार – अविद्या, राग, द्वेष, अस्मिता, अभिनिवेश, ईश्वर का स्वरूप, कैवल्य।

Suggested Readings

1. सुरेशचन्द्र, श्रीवास्तव, पातंजल योग दर्शन, चौखम्भा सुरभारती प्रकाशन, वाराणसी, 2013
2. स्वामी ब्रह्मलीन मुनि, पातंजल योग दर्शन, चौखम्बा संस्कृत सिरीज, वाराणसी, 1970.
3. स्वामी हरिहरानन्द आरर्यनक, भाषवती, सांख्य योग दर्शन, चौखम्बा संस्कृत सिरीज, वाराणसी, 1970
4. S. N. Dasgupta, Yoga Philosophy in Relation to other systems of Indian Thought, MLBD, 1974.
5. S.N. Dasgupta, History of Indian Philosophy, Vol.V, Cambridge, 1922.

B.A. (Hons.) Philosophy / बी.ए. (ऑनर्स) दर्शनशास्त्र

Semester - VI / सेमेस्टर–VI

Paper -H-XIV

Max. Marks - 70
Min. Marks - 25

Indian Religion / भारतीय धर्म

UNIT-I / इकाई -I

Hinduism - A General Introduction of Veda, Upaniṣad, smriti and Purānas.
हिन्दू धर्म – वेद, उपनिषद्, स्मृति एवं पुराण का सामान्य परिचय।

UNIT-II / इकाई -II

Purusārtha, Varnavyastha and Ashramavyastha.
पुरुषार्थ, वर्णव्यवस्था और आश्रम व्यवस्था।

UNIT-III / इकाई -III

Jainism - Mahavira's life, Triratna, Svetāmbra-Digambara, Anuvrata-Mahāvrata.
जैन धर्म – महावीर का जीवन परिचय, त्रिरत्न, श्वेताम्बर–दिगम्बर, अणुव्रत–महाव्रत।

UNIT-IV / इकाई -IV

Buddhism - Buddha's Life, Hinayāna, Mahāyāna, Ideal of Bodhisattva, Arhat, Nirvāna.
बौद्ध धर्म – बुद्ध का जीवन परिचय, हीनयान, महायान, बोधिसत्व का आदर्श, अर्हत्, निर्वाण।

UNIT-V / इकाई -V

Sikhism - History, Life of Guru Nanaka,. Mūlamantra, Ethics and Social aspects of Sikhism.
सिक्ख धर्म – इतिहास, गुरूनानक का जीवन परिचय, मूलमंत्र, सिक्ख धर्म का नैतिक एवं सामाजिक दृष्टिकोण।

Suggested Readings

1. डॉ. हरेन्द्र प्रसाद सिन्हा, धर्म दर्शन की रूपरेखा, मोतीलाल बनारसीदास, दिल्ली, 1962
2. डॉ. श्रीकान्त मिश्र, भारतीय नीतिशास्त्र, राधा पब्लिकेशन, आगरा, 2018
3. डॉ. बलदेव उपाध्याय, आर्य संस्कृति, शारदा मंदिर, 1945
4. Jodh Singh, The Religious Philosophy of Guru Nanak, Motilal Banarasi Das, New Delhi-1983.
5. D.S. Sharma, Hinduism Through the Ages, Bhāratīya Vidya Bhawan, 1973
6. J. Jaini, Outlines of Jainism, Cambridge, 1940.
7. E. George, Buddhism, its Essence and Development, Philosophical Library, 1954.

B.A. (Hons.) Philosophy / बी.ए. (ऑनर्स) दर्शनशास्त्र

Semester - VI / सेमेस्टर–VI

Paper -H-XV

Max. Marks - 70
Min. Marks - 25

Vedanta Philosophy / वेदान्त दर्शन

UNIT-I / इकाई -I

Gounapadacharya - Ajativada, AtmaTattvavada, Ashparshayoga.
गौड़पादाचार्य – अजातिवाद, आत्मतत्त्ववाद, अस्पर्शयोग।

UNIT-II / इकाई -II

Acharya Shamkara - Adhyasa, Vivartavada, Nature of Atman, Nature of Jivan-mukti.
आचार्य शंकर – अध्यास, विवर्तवाद, आत्मा का स्वरूप, जीवन–मुक्ति का स्वरूप।

UNIT-III / इकाई -III

Ramanujacharya - Meaning of Vishishtadvaita, Bondage and Liberation, Nature and Forms of Devotion.
रामानुजाचार्य – विशिष्टाद्वैत का अर्थ, बन्धन और मोक्ष, भक्ति का स्वरूप एवं प्रकार।

UNIT-IV / इकाई -IV

Madhavacharya - Meaning of Dvaitvada, Nimbarkacharya - Meaning of Dvaitadvaitavada, Vallabhacharcya - Meaning of Shuddhadvaitavada, Chaitanya Mahaprabhu - Meaning of Achintyabhedabhedavada.
मध्वाचार्य – द्वैतवाद का अर्थ, निम्बार्काचार्य – द्वैताद्वैतवाद का अर्थ, वल्लभाचार्य – शुद्धाद्वैतवाद का अर्थ, चैतन्य महाप्रभु – अचिन्त्यभेदाभेदवाद का अर्थ।

UNIT-V / इकाई -V

Swami Vivekanda - Theory of Maya, Practical Vedanta, Mahatma Gandhi - Sarvadharma Sambhava, Dr. S. Radhakrishnan - Nature of Absolute.
स्वामी विवेकानन्द – माया सिद्धान्त, व्यवहारिक वेदान्त, महात्मा गाँधी – सर्वधर्म समभाव, डॉ. एस. राधाकृष्णन् – परम सत् का स्वरूप।

Suggested Readings

1. डॉ. चन्द्रधर शर्मा, भारतीय दर्शन अलोचन और अनुशीलन, मोतीलाल बनारसीदास, दिल्ली 1995
2. डॉ. बी.एन. सिंह एवं डॉ. आशा सिंह, भारतीय दर्शन, स्टूडेण्ट्स फ्रेण्ड्स एण्ड कम्पनी काशी हिन्दू विश्वविद्यालय मार्ग लंका, वाराणसी–5, 1996
3. बी.के. लाल, समकालीन भारतीय दर्शन, मोतीलाल बनारसीदास, दिल्ली 2009
4. प्रो. हरेन्द्र प्रसाद सिन्हा, भारतीय दर्शन की रूपरेखा, मोतीलाल बनारसीदास, दिल्ली, 1963
5. लक्ष्मी सक्सेना, समकालीन भारतीय द र्न, उत्तर प्रदे ा हिन्दी ग्रन्थ अकादमी, लखनऊ, 1974
6. Dutta & Chatterjee, An Introduction to Indian Philosophy, University of Calcutta, 1968
7. M. Hiriyanna, Outlines of Indian Philosophy, George Allen and Unwin, Lodon,1932
8. Dutta & Chatterjee, An Introduction to Indian Philosophy, University of Calcutta, 1968

B.A. (Hons.) Philosophy / बी.ए. (ऑनर्स) दर्शनशास्त्र

Semester - VI / सेमेस्टर–VI

Paper - H-XVI

Max. Marks - 100
Min. Marks - 36

Comprehensive Viva / विशद् मौखिकी

Comprehensive Viva will be based on entire course of B.A. (Hons.) Philosophy.
विशद् मौखिकी परीक्षा सम्पूर्ण बी.ए. (ऑनर्स) दर्शनशास्त्र पाठ्यक्रम पर आधारित होगी।

B.A. (Hons) Philosophy / बी.ए. (ऑनर्स) दर्शनशास्त्र
Semester - I / सेमेस्टर – I

Paper - FC- I

Max. Marks -70
Min. Marks -25

Foundation Course / vk/kkj ikB~;Øe

Hindi Language / fgUnh Hkk"kk

इकाई – 1

हिन्दी की सामान्य प्रवृत्तियाँ, वाक्य रचना एवं प्रकार (रचना तथा अर्थ के आधार पर), हिन्दी की व्याकरणिक कोटियाँ – लिंग, पुरुष, वचन, कारक, पक्ष, काल, वृत्ति और वाच्य, हिन्दी के वाग्भाग।

इकाई –2

हिन्दी वाक्य विन्यास एवं अंग्रेजी वाक्य विन्यास में मूलभूत अंतर, सोदाहरण प्रयोग। हिन्दी अनुवाद की प्रविधि एवं प्रक्रिया। अनुवाद के सामान्य सिद्धांत, प्रविधि एवं प्रक्रिया। हिन्दी अनुवाद की समस्याएँ।

इकाई –3

पारिभाषिक शब्दावली की परिभाषा एवं नियम, पारिभाषिक शब्दों के उदाहरण – प्रशासनिक, विज्ञान, वाणिज्य एवं मानविकी के पारिभाषिक शब्द व उनके हिन्दी अनुवाद।

इकाई –4

हिन्दी की व्यावहारिक स्थिति, संवाद की विशेषताएँ। अच्छे संवाद के गुण, हिन्दी में लय, अनुतान एवं बलाघात का सोदाहरण परिचय।

इकाई –5

संचार माध्यमों में हिन्दी–प्रयोग की स्थिति, आकाशवाणी, दूरदर्शन, तथा पत्र–पत्रिकाओं में हिन्दी का व्यावहारिक प्रयोग, समस्याएँ एवं समाधान।

संदर्भ पुस्तक

1. हिन्दी भाषा एवं संरचना, मध्यप्रदेश हिन्दी ग्रन्थ अकदमी, भोपाल।
2. डॉ. शिवमूर्ति शर्मा, सामान्य हिन्दी, शारदा पुस्तक भवन, इलाहाबाद, संस्करण 2005
3. भाषा विज्ञान हिन्दी भाषा और लिपि, रामकिशोर शर्मा, लोकभारती प्रकाशन, इलाहाबाद, 2007

B.A. (Hons) Philosophy / बी.ए. (ऑनर्स) दर्शनशास्त्र

Semester - II / सेमेस्टर – II

Paper -FC-II

Max. Marks -70
Min. Marks -25

Foundation Course / vk/kkj ikB~;Øe

English Language / vaxzsth Hkk"kk

UNIT-I

Noun - Definition, Kinds of Noun, Functions of Noun, Number, Gender, Case and Common errors in use of Nouns. Framing of sentences using Nouns. **Pronoun -** Definition, Kind of Pronoun, Functions of Pronoun, Number, Gender, Case and Common errors in use of Pronouns. Framing of sentences using Pronouns. One word Substitution, Synonyms and Antonyms.

UNIT-II

Tenses and their types, Prepositions, Verbs, Articles, Adverb, function of Adverb, Framing the sentence using Adverb.

UNIT-III

Adjective - Definition of Adjective, Kinds of Adjective, Degree of an Adjective, Common Error in Use of Adjective. Framing of sentences using Adjectives, Words often Confused, Framing of sentences with pairs of confusing words, Correction of sentences.

UNIT-IV

Letter Writing, Translation of the passage from Hindi to English

UNIT-V

Comprehension of unseen passage, Translation of a passage from English to Hindi.

Suggested Readings

1. P.C. Wren and H. Martin, High School English Grammar and Composition.
2. G. Yule, Oxford Practice Grammar Book.
3. L. Walker, Basic English Composition by Bonnie.
4. Advanced English Grammar by Martin Hewings.

B.A. (Hons) Philosophy / बी.ए. (ऑनर्स) दर्शनशास्त्र

Semester - III / सेमेस्टर – III

Paper - FC-III

Max. Marks -70
Min. Marks -25

Foundation Course / आधार पाठ्यक्रम

Environmental Studies / पर्यावरण अध्ययन

Unit - I / bdkbZ & I

Environment - Definition, Scope and Importance, Environment in Indian Culture, Public Awareness for Environmental safety.
पर्यावरण – परिभाषा, क्षेत्र एवं महत्व, भारतीय संस्कृति में पर्यावरण, पर्यावरण सुरक्षा हेतु जनजागरूकता।

Unit - II / bdkbZ &II

Ecosystem - Concept, Biological Factors, Structure & Function.
पारिस्थितिक तन्त्र – अवधारणा, जैविक घटक, संरचना तथा कार्यप्रणाली।

Unit - III / bdkbZ &III

Biodiversity and its Conservation, Biodiversity - Introduction, Problems and Conservation, Levels of Biodiversity - Genetic, species and ecosystem diversity, Bio-Geographic Classification of India.
जैव विविधता और उसका संरक्षण, जैव विविधता – परिचय, समस्याएँ एवं संरक्षण, जैव विविधता के स्तर – अनुवांषिक, जातीय एवं परिस्थितिक विविधता, भारत का जैव–भौगोलिक वर्गीकरण।

Unit - IV / bdkbZ &IV

Natural Resources - Introduction, Problems and Conservation, Different types of Natural Resources - Forest, Land, Food, Energy and Water.
प्राकृतिक संसाधन – परिचय, समस्याएँ एवं संरक्षण, प्राकृतिक संसाधनों के विभिन्न प्रकार – वन, भूमि, खाद्य, ऊर्जा एवं जल।

Unit - V / bdkbZ &V

Environmental Pollution and Population, Environmental Pollution - Definition, Causes, Effects, Population Explosion, Prevention of Pollution, Family Welfare Programme, Environment and Human Health.
पर्यावरणीय प्रदूषण तथा जनसंख्या, पर्यावरणीय प्रदूषण – परिभाषा , कारण, प्रभाव, जनसंख्या विस्फोट, प्रदूषण का निवारण, परिवार कल्याण कार्यक्रम, पर्यावरण एवं मानव स्वास्थ्य।

Suggested Readings

1. डॉ. वीरेन्द्र सिंह यादव, भारतीय संस्कृति में पर्यावरण चिन्तन के विविध आयाम, ओमेगा पब्लिकेशन्स, नई दिल्ली, 2010
2. डॉ. दया शंकर त्रिपाठी, पर्यावरण अध्ययन, मोतीलाल बनारसीदास, दिल्ली, 2005
3. डी.एस. त्रिपाठी, पर्यावरण चेतना (सम्पादित), 1997
4. P.D. Sharma- Elements of Ecology, 1988

B.A. (Hons) Philosophy / बी.ए. (ऑनर्स) दर्शनशास्त्र

semester - Iv / सेमेस्टर – Iv

Paper - FC-IV

Max. Marks -70
Min. Marks -25

Basic of Computer and Information Technology / कम्प्यूटर एवं सूचना तकनीकी का आधार

Unit - I / bdkbZ & I

History, Generation of Computers, Characteristics, Capabilities and Limitations, Classification of Computers and types of Digital computers. Hardware, Software, Types of software. Generations of Computer, Languages : High and low level languages, Types of Translators, Component of Computer System.

इतिहास, कम्प्यूटर की पीढ़ियाँ, विशेषताएँ, क्षमता और सीमाएँ, कम्प्यूटर का वर्गीकरण एवं डिजिडल कम्प्यूटर के प्रकार, हार्डवेयर, सॉफ्टवेयर, सॉफ्टवेयर के प्रकार, कम्प्यूटर भाषाओं की पीढ़ीयाँ, उच्चस्तरीय एवं निम्नस्तरीय भाषाएँ, ट्रॉसलेटर के प्रकार, कम्प्यूटर सिस्टम के घटक।

Unit - II / bdkbZ & II

Introduction of various input/output devices: Keyboard, mouse, MICR, OCR, OMR, Bar Code, Scanner, VDU, Plotter, Impact and Nonimpact printers, storage units : Bits and Bytes; Primary and Secondary Memories.

विभिन्न इनपुट/आउटपुट डिवाइस का परिचय – की–बोर्ड, माऊस, एम.आई.सी.आई., ओ.सी.आर., ओ.एम.आर., बारकोड, स्कैनर, वी.डी.यू.प्लॉटर, इम्पैक्ट और नॉन–इम्पैक्ट प्रिन्टर, स्टोरेज इकाई – बिट्स एवं वाइट्स, प्रायमरी एवं सेकेण्डरी मेमोरिज।

Unit - III / bdkbZ & III

Windows : Introduction, windows desktop, start button, taskbar, switching between programs and windows, managing files, folders and objects, windows explorer, creating shortcuts, control panel; windows accessories :– paintbrush, word pad, customizing windows, Internet Explorer.

विन्डोज : परिचय, विंडोज डेक्सटॉप, स्टार्ट बटन, टास्कबार, प्रोग्राम तथा विंडोज के बीच स्विच करना, फाइल मैनेज करना, फोल्डर्स एवं आइजैक्स, विंडोज एक्सप्लोरर, शॉर्ट–कट बनाना, कन्ट्रोल पैनल, विन्डोज एसेसरीज : पेन्ट, ब्रश, बर्ड पैड, विंडोज को कस्टमाइज करना, इन्टरनेट एक्सप्लोरर।

Unit - IV / bdkbZ & IV

MS WORD : Working with Headers, Footers, Endnotes, Footnotes, tabs, tables, sorting, Working with graphics: Importing graphics, Drawing objects, Text in Drawings (Word Art), Pictures using Drawing objects, Rotating and Flipping Objects, Spelling and Grammar Checker, Auto Correct, Auto Text, Creating Tables, Mail Merge.

एम.एस.वर्ड.: हैडर–फुटर, एन्डनोट्स, फुटनोट्स, टैब्स, टेबल्स, सॉटिंग के साथ कार्य करना, ग्राफिक्स के साथ कार्य करना – ग्राफिक्स इम्पोर्टिंग, ड्रॉईंग ऑब्जेक्ट्स, टेक्स्ट ड्रॉईंग (वर्ड आर्ट), ड्राइंग आब्जेक्ट का प्रयोग करके पिक्चर रोटेटिंग एवं ऑब्जेक्ट फ्लीपींग, स्पेलिंग और ग्रामर चेकर, ऑटो करेक्ट, ऑटो टेक्स्ट, क्रिएटिंग टेबल्स, मेल मर्ज।

Unit - V/ bdkbZ & V

MS POWERPOINT - Creating presentations, Auto content wizard, editing slides, Working with Text in Power Point, Formatting and Aligning Text; Working with graphics in Power Point; Importing images from the outside and drawing in power point, creating organizational charts, inserting clip arts & picture/photos in Power Point Presentation, Excel Charts in Power Point, Inserting Table from Word.

एम.एस. पॉवर प्वाइंट – प्रेजेन्टेशन बनाना, ऑटो कॅटेन्ट विजार्ड, एडिटिंग स्लाइट्स, पॉवर प्वाइंट में टेक्स्ट के साथ काम करना, फॉरमेटिंग एवं एलाइनिंग टेक्स्ट, पॉवर प्वाइंट में ग्राफिक्स के साथ कार्य करना, इमेज इम्पोर्ट करना एवं पॉवर प्वाइंट में ड्रॉइंग, ऑर्गनाइजेशनल चार्ट तैयार करना, पॉवर प्वाइंट प्रेजेनटेशन में क्लिप आर्ट एवं पिक्चर, फोटोज़ इन्सर्ट करना, पॉवर प्वाइंट में एक्सल चार्ट्स, वर्ड से टेबल इन्सर्ट करना।

Suggested Readings

1. Sinha, P.K.: Computer Fundamentals, BPB Publ.
2. Rapidex Computer Courses
3. Jain, Satish: Introduction to Computer Science, BPB Publ.
4. Mansfield R.: The Compact guide to MS-OFFICE, BPB

B.A. (Hons.) Philosophy / बी.ए. (ऑनर्स) दर्शनशास्त्र

Semester - I / सेमेस्टर–I

Subsidiary - Ancient History, Culture and Archaeology
उपविषय – प्राचीन भारतीय इतिहास, संस्कृति एवं पुरातत्त्व

Paper -S- I

Max. Marks - 70
Min. Marks - 25

Ancient Indian History / प्राचीन भारतीय इतिहास

Unit I /इकाई -I

History - Definition, Scope and Importance, History and Sociology, History and Political Science.
इतिहास – परिभाषा, क्षेत्र एवं महत्व, इतिहास एवं समाजशास्त्र, इतिहास एवं राजनीतिशास्त्र।

Unit II / इकाई -II

Source of Ancient Indian History - Religious Literature (Hindu Literature, Bouddha Literature and Jain Literature), Historical Scriptures (Mahakavya, Kautilya's Arthashastra, Banbhatta's Harshcharita.)

प्राचीन भारतीय इतिहास के स्रोत – धार्मिक साहित्य (हिन्दू साहित्य, बौद्ध साहित्य एवं जैन साहित्य), ऐतिहासिक ग्रन्थ (महाकाव्य, कौटिल्य का अर्थशास्त्र, बाणभट्ट का हर्षचरित)

Unit III / इकाई -III

Archaeological Sources - Inscription, Coins and Monuments.
पुरातात्त्विक स्रोत – अभिलेख, मुद्राएँ एवं स्मारक।

Unit IV / इकाई -IV

Foreign Sources - Megasthenes, Fahien, Hsuan Tsang, Alberuni.
विदेशी स्रोत – मेगस्थनीज, फाह्यान, ह्वेनसांग, अलबरूनी।

Unit V / इकाई -V

Pottery - Northern Black Polished Ware (NBP), Painted Grey Ware (PGW), Black and Red Ware.
मृदभाण्ड – उत्तरी कृष्णमार्जित पात्र परम्परा, चित्रित धूसर मृद्भाण्ड परम्परा, कृष्णलोहित पात्र परम्परा।

Suggested Readings

1. जयनारायण पाण्डेय, पुरातत्त्व विमर्श
2. सुषमा यादव एवं रामावतार शर्मा, भारतीय प्रागैतिहास
3. डॉ. राधाकान्त वर्मा, उपकरण निमार्ण एवं प्रविधि,
4. विमलचन्द्र पाण्डेय, प्राचीन भारत का इतिहास
5. Prof. Mahesh Ch. Srivastava - Ancient History of Indian.
6. K.C. Shreevastav, Ancient Indian History, Culture & Archaeology.

B.A. (Hons.) Philosophy / बी.ए. (ऑनर्स) दर्शनशास्त्र

Semester - II / सेमेस्टर – II

Subsidiary - Ancient History, Culture and Archaeology
उपविषय – प्राचीन भारतीय इतिहास, संस्कृति एवं पुरातत्त्व

Paper - S - II

Max. Marks - 70
Min. Marks - 25

Fundamentals of Ancient Archaeology / प्राचीन पुरातत्त्व के मूल तत्व

Unit I /इकाई -I

General Introduction of Stone age in India, Definition of Pre-history Age Paleo Fithic age (Son Vally, Narmada Vally).
भारत में पाषाण काल का सामान्य परिचय, प्राक् इतिहास काल की परिभाषा, पुरापाषाण काल (सोनघाटी, नर्मदाघाटी)

Unit II /इकाई -II

Harappa Civilization - Origin, Development, Main Characteristics, Couse of Degration.
हड़प्पा सभ्यता – उद्भव, विकास, मुख्य विशेषताएँ, पतन के कारण।

Unit III /इकाई -III

Meaning, Definition and Scope of Archaeology, History of Archaeology in India.
पुरातत्त्व का अर्थ, परिभाषा एवं क्षेत्र, भारत में पुरातत्त्व का इतिहास।

Unit IV /इकाई -IV

Introduction of Rock Art of India, Rock Art of Vindya Rigion (Morhana, Gaddi, Dharkundi, Deor Kothar).
भारत की शैल चित्रकला का परिचय, विन्ध्य की शैल चित्रकला (मोरहना, गड्डी, धारकुण्ड़ी, देउर कोठार)।

Unit V/इकाई -V

Tools Techniques and Use, Conservation and Preservation of Archaeological Materials.
उपकरण निर्माण प्रविधि एवं उपयोग, पुरातात्त्विक सामाग्रियों का संरक्षण एवं परिरक्षण।

Suggested Readings

1. सुधीर त्रिवेदी, मध्य भारत की प्रतिहार कला एवं स्थापत्य।
2. चन्द्रदेव सिंह, प्राचीन भारतीय समाज और संस्कृति
3. एच.सी. मजूमदार, प्राचीन भारतीय इतिहास
4. राधाकान्त वर्मा, पुरातत्व अनुशीलन
5. Prof. Mahesh Ch. Srivastava - Archaeology, Theory and Practice.

B.A. (Hons.) Philosophy / बी.ए. (ऑनर्स) दर्शनशास्त्र

Semester - III / सेमेस्टर – III

Subsidiary - Ancient History, Culture and Archaeology
उपविषय – प्राचीन भारतीय इतिहास, संस्कृति एवं पुरातत्त्व

Paper - S- III

Max. Marks - 70
Min. Marks - 25

Ancient Indian Culture / प्राचीन भारतीय संस्कृति

Unit I /इकाई -I

Concept of culture, Characteristics of Indian Culture, Concept of Vasudhaiva Kutumbakam, Meaning of Dharma.
संस्कृति की अवधारणा, भारतीय संस्कृति की विशेषताएँ, वसुधैव कुटुम्बकम् की अवधारणा, धर्म का अर्थ।

Unit II /इकाई -II

Varnavyastha - Duties of Brahman, Kshatriya, Vaishya, Shudra, Ashramvyastha - Duties of Brahmacharya, Grihastha, Vanaprastha and Sannyas.
वर्णव्यवस्था – ब्राह्मण, क्षत्रिय, वैश्य एवं शूद्र के कर्तव्य, आश्रम व्यवस्था – ब्रह्मचर्य, गृहस्थ, वानप्रस्थ एवं संन्यास आश्रम के धर्म / कर्तव्य।

Unit III /इकाई -III

Concept of Purushartha Vyavastha, (Dharma, Artha, Kama and Moksha), Samskar - Meaning and Relevance,
पुरूषार्थ व्यवस्था की अवधारणा (धर्म, अर्थ, काम और मोक्ष), संस्कार – अर्थ एवं प्रासंगिकता।

Unit IV /इकाई -IV

Marriage - Objective and Kinds (Brahma, Daiva, Arsha, Prajapatya, Asura, Gandharva, Rakshasa and Paishacha).
विवाह – उद्देश्य एवं प्रकार (ब्राह्म, दैव, आर्ष, प्राजापत्य, आसुर, गांधर्व, राक्षस एवं पैशाच)।

Unit V /इकाई V

Panchamahayajna - Brahmayajna, Pitriyajna, Devayajna, Bhutyajna and Nriyajna, Rinatrya -Devarina, Rishirina and Pitririna, Concept of Family.
पंच महायज्ञ – ब्रह्मयज्ञ, पितृयज्ञ, देवयज्ञ, भूतयज्ञ एवं नृयज्ञ, ऋणत्रय – देवऋण, ऋषिऋण एवं पितृऋण, परिवार की अवधारणा।

Suggested Readings

1. **डॉ. श्रीकान्त मिश्र,** भारतीय नीतिशास्त्र, आशा पब्लिशिंग कम्पनी, आगरा, 2018
2. जयशंकर प्रसाद, प्राचीन भारत का सामाजिक इतिहास
3. के.सी. श्रीवास्तव, प्राचीन भारतीय इतिहास एवं संस्कृति
4. विमला देवी राय, वेद कालीन समाज एवं संस्कृति
5. बी.एन. लूनिया, प्राचीन भारतीय संस्कृति

B.A. (Hons.) Philosophy / बी.ए. (ऑनर्स) दर्शनशास्त्र

Semester - IV / सेमेस्टर–IV

Subsidiary - Ancient History, Culture and Archaeology
उपविषय – प्राचीन भारतीय इतिहास, संस्कृति एवं पुरातत्त्व

Paper -S- IV

Max. Marks - 70
Min. Marks - 25

Ancient Indian Religion and Philosophy / प्राचीन भारतीय धर्म एवं दर्शन

Unit I /इकाई -I

Concept of Religion, Vedic Religion, Concept and Importance of Yajna, Characteristics of Vedic Religion.
धर्म की अवधारणा, वैदिक धर्म, यज्ञ की अवधारणा एवं महत्व, वैदिक धर्म की विशिष्टताएँ।

Unit II /इकाई -II

Shaiva Dharma - Sampradaya and Characteristics, Vaishnava Dharma - Origin, Development and Characteristics, Shakta Dharma - Characteristics.
शैव धर्म – सम्प्रदाय एवं विशेषताएँ, वैष्णव धर्म – उद्भव, विकास एवं विशेषताएँ, शाक्त धर्म – विशेषताएँ।

Unit III /इकाई -III

Bouddha Dharma - Origin, Development, Teaching and Characteristics, Jaina Dharma - Origin, Development, Teaching and Characteristics,
बौद्धधर्म – उद्भव, विकास, शिक्षा एवं विशेषताएँ, जैन धर्म – उद्भव, विकास, शिक्षा एवं विशेषताएँ।

Unit IV /इकाई -IV

Characteristics of Indian Philosophy, An Introduction of Charvaka, Samkhya, Yoga Philosophy.
भारतीय दर्शन की विशेषताएँ, चार्वाक, सांख्य, योग का सामान्य परिचय।

Unit V /इकाई -V

An Introduction of Nyaya, Vaisheshika, Mimamsa and Vedanta Philosophy .
न्याय, वैशेषिक, मीमांसा एवं वेदान्त दर्शन का सामान्य परिचय।

Suggested Readings

1. डॉ. श्रीकान्त मिश्र, भारतीय नीतिशास्त्र, आशा पब्लिशिंग कम्पनी, आगरा, 2018
2. वासुदेवशरण अग्रवाल, भारतीय कला, वाराणसी 1977
3. हरिदास भट्टाचार्य, द कल्चरल हेरिटेज ऑफ इण्डिया,
4. पी. के. भट्टाचार्य, "हिस्टोरिकल ज्यॉग्राफी ऑफ मध्यप्रदेश फ्राम अर्ली रिकार्ड", दिल्ली 1977.
5. महेशचन्द्र श्रीवास्तव, जैन धर्म एवं दर्शन
6. ए.एस, अल्टेकर, वैष्णव, शैव एवं शाक्त धर्म
7. जी.सी. पाण्डेय, बौद्ध धर्म का इतिहास
8. V.S. Pathak- Shavim.

(As passed in Board of Studies meeting held on 17

REGULATION Ordinance 2022

AWADHESH PRATAP SINGH UNIVERSITY, REWA (M.P.)

Bachelor of Arts (Honours)

Regulation for B.A. Honours course under self-financing programme

This regulation will be applicable to BA. Honors run under self-financing programme of the University.

1. **Admission:**
   a. Admission to B.A. Honours course shall be open to students from all over the country and shall be made either by merit or by a written Entrance Test as decided by the University/State Government.

   b. Candidates seeking admission to B.A. Honors must have passed the 10+2 exam of a board/CBSE/ICSE/or an equivalent body, as established by law.

   c. Candidates must have passed the 10+2 exam by statutary Board of examination.

   d. The students with computer science as one of the subjects may also be considered for admission in the course of their choice as permitted by the admission committee.

   e. Reservation of seats for SC/ST/OBC etc. shall be as per reservation policy of the state government as applicable to higher education institutions of Madhya Pradesh.

   f. Other admission rules as framed by the state government or university shall be applicable for admission to these courses as decided by the competent authority from time to time.

2. **Number of Seats:**
   Number of seats in B.A. Honors courses will be decided by the university authorities from time to time.

3. **Duration of the Course:**
   Duration of the course shall be of three academic years or with a total of six semesters, covering two semesters in each academic year.

4. **Fee Structure:**
   Fee structure of the course shall be decided by the competent authority of the university from time to time.

5. **Structure of the Course:**
   Candidates seeking degree of B.A. Honors shall be required to study and examined the papers in each semesters as per decided by the competent authority of the university from time to time.

6. **Syllabus of the Course:**
   The Syllabus of B.A. Honours shall be as framed by the competent authority of the university from time to time.

7. **Attendance:**
   a. A candidate appearing in the examination shall be required to attend at least 75% of the lectures in theory & Practical classes separately in each paper in order to be

eligible to appear in the examination, provided that attendance can be condoned as per rules of the university.

8. **Examination:**
   a. Each student shall have to appear in the examination of theory /practicals/internal assessment separately at the end of each semester. The internal assessment will be held in the manner prescribed from time to time by the university/state government.

   b. 30 % marks of each theory paper will be earmarked for internal assessment in each semester. Each theory papers will carry 70 % marks in each semester.

   c. A student shall have to pass separately in each paper (both theory & practical / internal assessment) in order to pass in each semester examination.

   d. For passing the examination the candidate shall be required to secure at least 36 % marks separately in each theory /practical /internal assessment examination in each semester.

   e. There shall be no supplementary examination in case of semester system.

   f. The existing rules of university or state government (framed for semester examination of under graduate classes) shall be applicable to students regarding allow to keep the term (ATKT) and promotion to the next semester, eligibility to carry the backlog of the student of each semester examination, eligibility for Ex-student, eligibility for final declaration of results etc.

   g. The special examinations as decided by the university / state government may be permitted.

9. **Award of Division**:
   a. No division shall be awarded at the end of 1st to 5th semester. A student passing each (from 1st to 5th) semester examination shall be simply promoted to the next semester of the course as may be. Students clearing all the six semester examination and shall be awarded division taking the aggregate of the marks obtained in theory / practical / internal assessment in all the six semester's as follows:

60 % or above:	1st Division
45 % but less than 60% :	2nd Division
36 % but less than 45 % :	3rd Division

10. A candidate has to complete the entire course of under graduate degree within a maximum period of five years from the session of first admission provided that any decision made by the state government / University in the matter shall be applicable.

11. In matters of admission, attendance, examinations & in all the other matters not provided in this regulation, the courses shall be governed by the provisions of the relevant ordinances of the same in the university so far as they are not inconsistent with the provisions of this regulation.

12. Issues not covered in this regulation shall be decided by the Vice chancellor

13. In case of any dispute/ambiguity, the ruling of the Vice-Chancellor shall be final.

B.A. (Honours) Psychology
Department of Psychology
A.P.S. University, Rewa (M.P.)

EXAMINATION SCHEME

S.No.	Paper Name	External Assessment		Internal Assessment		Total Max. Marks
		Max.	Min.	Max.	Min.	
	Semester - I					
1.	Paper - I Hindi Language / fgUnh Hkk"kk	70	25	30	11	100
2.	Paper – II Basic Psychological Processes	70	25	30	11	100
3.	Paper – III Psychopathology	70	25	30	11	100
4.	Paper – IV Subsidiary (Sociology) Introduction to Sociology	70	25	30	11	100
	Semester - II					
1.	Paper – V English Language / vaxzsth Hkk"kk	70	25	30	11	100
2.	Paper – VI Psychological Statistics	70	25	30	11	100
3.	Paper – VII Human Development	70	25	30	11	100
4.	Paper – VIII Subsidiary (Sociology) Society in India	70	25	30	11	100
	Semester - III					
1.	Paper – IX Environmental Studies	70	25	30	11	100
2.	Paper – X Social Psychology	70	25	30	11	100
3.	Paper – XI Psychological Assessment	70	25	30	11	100
4.	Paper – XII Indian Society – Issues and Problems	70	25	30	11	100
	Semester - IV					
1.	Paper – XIII Introduction to Computers, MS-Office and Internet	70	25	30	11	100
2.	Paper – XIV Counselling Psychology	70	25	30	11	100
3.	Paper – XV Organisational Behaviour	70	25	30	11	100
4.	Paper – XVI Subsidiary (Sociology) Rural and Urban Sociology	70	25	30	11	100
	Semester - V					
1.	Paper – XVII Clinical Psychology	70	25	30	11	100
2.	Paper – XVIII Personality Psychology	70	25	30	11	100
3.	Paper – XIX Community Psychology	70	25	30	11	100
4.	Paper - XX Project and Viva Voce	-	-	-	-	100
	Semester - VI					
1.	Paper – XXI Educational Psychology	70	25	30	11	100
2.	Paper – XXII Applied Psychology	70	25	30	11	100
3.	Paper – XXIII Psychological Research Methods	70	25	30	11	100
4.	Paper – XXIV Practicals and Viva Voce	-	-	-	-	100

Department of Psychology
A.P.S. University, Rewa (M.P.)

B.A. (Honours): Semester: **I**
Subject: Psychology Paper – I Hindi Language / fgUnh Hkk"kk

bdkbZ & 1

fgUnh dh lkekU; izo`fRr;kWa] okD; jpuk ,oa izdkj ¼jpuk rFkk vFkZ ds vk/kkj ij½ fgUnh dh O;kdjf.kd dksfV;kWa & fyax] iq:"k] opu] dkjd] i{k] dky] o`fŸk vkSj okP;] fgUnh ds okXHkkxA

bdkbZ & 2

fgUnh okD; foU;kl ,oa vxzsth okD; foU;kl esa ewyHkwr varj] lksnkgj.k iz;ksxA fgUnh vuqokn dh izfof/k ,oa izfØ;kA vuqokn ds lkekU; fl)kar] izfof/k ,oa izfØ;kA fgUnh vuqokn dh leL;k,WA

bdkbZ & 3

ikfjHkkf"kd 'kCnkoyh dh ifjHkk"kk ,oa fu;e] ikfjHkkf"kd 'kCnksa ds mnkgj.k & iz'kklfud] foKku] okf.kT; ,oa ekufodh ds ikfjHkkf"kd 'kCn o muds fgUnh vuqoknA

bdkbZ & 4

fgUnh dh O;kogkfjd fLFkfr] laokn dh fo'ks"krk,WaA vPNs laokn ds xq.k] fgUnh esa y;] vuqrku ,oa cyk?kkr dk lksnkgj.k ifjp;A

bdkbZ & 5

lapkj ek/;eksa esa fgUnh&iz;ksx dh fLFkfr] vkdk'kok.kh] nwjn'kZu rFkk i=&if=dkvksa esa fgUnh dk O;kogkfjd iz;ksx] leL;k,Wa ,oa lek/kkuA

Department of Psychology
A.P.S. University, Rewa (M.P.)

B.A. (Honours): Semester: **I**

Subject: Psychology Paper – II **Basic Psychological Processes**

Unit I

INTRODUCTION: Definition and Goals of Psychology, Theoretical approaches to study of psychology- Biological, Psychodynamic, Cognitive, Behavioural, and Humanistic (general idea), Methods- Experimental, Correlational, Observation and Case study.

Unit II

ATTENTION & PERCEPTION: Attention: Nature Determinants, Span and division of attention. Perception: Perceptual process, perceptual organization, Perceptual constancy and illusion.

Unit III

LEARNING: Learning, Meaning and process, Basic learning theories - Classical & Operant conditioning, Trial and Error, Insight, Verbal learning- Methods and Determinants, Transfer of training.

Unit IV

Memory: Stages of memory: Encoding, storage and retrieval processes; Sensory-Memory, Short-Term memory (STM) and Long-term memory (LTM).

Unit V

Motivation and Emotion

a) Motivation: Concept and Characteristics of motivational behavior. Types of motives. Need hierarchy model.

b) Emotion: Definition and nature. Physiological changes in emotion. Cannon-Bard theory, James-Lange theory.

BOOKS RECOMMENDED:

1. Zimbarodo, P.G. & Gerrig, R.J. (2010). Psychology and Life. Delhi: Allyn & Bacon.
2. Baron, R.A., "Psychology: The Essential Science" (1995), New York: Allyn & Bacon.
3. Ciccarelli, S.K. & Meyer, G.E. (2008). Psychology (South Asian Ed.) Newdelhi: Pearson Longman.
4. Passer, M.W. & Smith, R.E. (2007). Psychology: The Science of Mind and Behavior. (3rd Edition). Newdelhi: Tata Mcgraw Hill.
5. Comer & Gould. (2011). Psychology around us. Wiley India.
6. Bernstein, Roy, Clarke-Stewart; "Psychology"; 3rd edition.
7. Atkinson & Atkinson (1990) : Introduction to Psychology.
8. Dr. D. Sinha. Samanya Manovigyan. Rupa, Vranasi.
9. L.B. Tripathi. Adhunik Samanya Vigyan.
10. Singh, A.K. Uchattar Samanya Manovigyan. Motilal Banarsi Das, Varanasi.

Department of Psychology
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B.A. (Honours): Semester: **I**

Subject: Psychology Paper – III Psychopathology

Unit I

Introduction: Concept and characteristics of normality and abnormality, Difference between normal and abnormal behaviour, Classification of disorders, Models of abnormal behaviour: Psychodynamic, Behavioural, Cognitive & Humanistic.

Unit II

Psychoneurotic Disorders Anxiety, Phobia & its types, Obsessive - compulsive disorder, Difference between Psychoneurosis and Psychosis.

Unit III

Psychotic Disorders: Schizophrenia & its types. Mood Disorders: Symptoms and etiology of mood disorders. Bipolar Affective Disorder.

Unit IV

Personality Disorders: Personality Disorders: Types, Cousal Factors and Treatment, Anti-Social Personality, Disorders due to Alcohol and Substance Use.

Unit V

Cognitive Disorders: Nature of cognitive disorder, Aging, Amnestic disorders, Delirium, Dementia, Dementia of Alzheimer's type or DAT.

Books Recommended:

1. Sarason & Sarason, "Abnormal Psychology" (10th Edition). Pearson.
2. Carson Butcher & Mineka, “Abnormal Psychology & Modern Life” (10th Edition). Pearson.
3. Davidson & Neale (1990), “Abnormal Psychology” (7th Edition)
4. Korchin S.J. (1986), "Modern Clinical Psychology"
5. Lamm, A (1997); “Introduction to Psychopathology”
6. Oltman and Emery - Abnormal Psychology
7. Colman - Abnormal Psychology
8. A.K. Singh – “Asamanya Manovigyan” Motilal Banarsidas, Varanasi.

Department of Psychology
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B.A. (Honours): Semester: **I**

Subject: Psychology Paper – IV Subsidiary (Sociology) Introduction to Sociology

Unit I

The Meaning, Nature & Scope of Sociology, Sociological Perspective, Sociology & Other Social Sciences, Scientific and Humanistic Orientations to Sociological Studies.

Unit II

Basic Concepts: Society, Community, Institution, Association, Social Group, Social Structure & Function, Status and Role.

Unit III

Individual & Society: Socialization, Culture, Relation between individual and Society, Social Control: Folkways, Customs, Mores and Social Values.

Unit IV

Social Stratification: Meaning, Characteristics & Forms: Caste, Class, Power and Social Mobility.

Unit V

Social Change: Meaning, factors, theories, forms, impact of modernization & Globalization.

Recommended Readings:

1. Jayaram, N. 1998, Introductory Sociology: Madras: Macmillan, India.
2. egktu /keZohj] egktu deys'k] foosd lekt'kkL= dh izkFkfed vo/kkj.kk,a izdk'ku 7 ;w-,-tokgj uxj fnYyh
3- Johnson, Harry M. 1995, Sociology: A Systematic Introduction, New Delhi: Allied Publisher.
4. Schaefer, Richard T. and Robert P. Lamm. 1999, Sociology, New Delhi: Tata McGraw Hill.
5. Abraham, M. Francis, 2006, Contemporary Sociology: An Introduction to Concepts & Theories, New Delhi: Oxford University Press.
6. Kuppuswamy, B. 1972, Social Change in India, New Delhi: Konark Publishers Pvt. Ltd.
7. Davis, Kingsley. 2004, Human Society, New Delhi: Surjeet Publications.

Department of Psychology
A.P.S. University, Rewa (M.P.)

B.A. (Honours): Semester: **II**

Subject: Psychology Paper – V English Language / vaxzsth Hkk"kk

Unit I

Noun: Definition, Kinds of Noun, Functions of Noun, Number, Gender, Case and common errors in use of Nouns. Framing of sentences using nouns

Pronoun: Definition, Kinds of Pronoun, Functions of Pronoun, Number, Gender, Case and common errors in use of Pronouns. Framing of sentences using pronouns.

One word Substitution

Synonyms and antonyms

Unit II

Tenses and their types Prepositions, Verbs, Articles, Adverb function of Adverb Framing the sentence using Adverb.

Unit III

Adjective: Definition of Adjective, Kinds of Adjective, Degree of an Adjective, Common Errors in Use of Adjectives. Framing of sentences using adjectives.

Words Often Confused, Framing of sentences with pairs of confusing words.

Correction of sentences

Unit IV

Letter Writing

Translation of the passage from Hindi to English

Unit V

Comprehension of unseen passage

Translation of a passage from English to Hindi

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B.A. (Honours): Semester: **II**

Subject: Psychology Paper – VI PsychologicalStatistics

Unit I

Statistics and Measurement: Meaning, Types and Application of Statistics in Psychology, Nature and types of Psychological data, Measurement, Nature and Types.

Unit II

Frequency Distribution: Drawing of frequency distribution; Graphical representation of grouped data- Bar diagram, histogram, frequency polygon & ogive curve.

Unit III

Measures of Central Tendency: Characteristics, Computation and Application-Mean, Median and Mode.

Unit IV

Measures of Variability: Concept of variability; Range, Average Deviation and Quartile Deviation; Standard Deviation, Concept and Characteristics of Normal Probability Curve; Deviation from NPC – Skewness and Kurtosis.

Unit V

Correlation and Level of Significance: The Concept of correlation- Linear and non-linear correlation; Pearson's Product-Moment Correlation; Spearman's Rank-order Correlation, t-test chi-square

Book Recommended:

1. Broota, K.D (1992), Experimental Design in Behavioural Research, New Delhi: Wiley Eastern.
2. Siegel, S. (1994), Nonparametric Statistics, N.Y.
3. Kerlinger F.N., (1983), Foundations of Behavioural Research, New York; Surjeet Publication
4. Garret, H.E. Psychology and Statistics
5. Singh A.K., Psychology and Measurement and Research Methods in Behavioral Sciences, Bharti Bhawan Publication New Delhi
6. Mun, Psychological Statistics
7. Aron & Aron, Statistics for Psychology, (6th Edition)

Department of Psychology
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B.A. (Honours): Semester: II

Subject: Psychology Paper – VII Human Development

Unit I

Introduction: Concept of Human development, Laws and Principles, Methods of studying development.

Unit II

Theories and Foundations of Human Development: Theories of Development: Freud, Erikson and Maslow.

Unit III

Physical & Motor Development: Childhood, adolescence, adulthood and old age.

Unit IV

Social Development (Infancy to Adolescence): Meaning, Gender role typing, Play interest and activities. Socialization - Nature and agents of Socialization.

Unit V

Moral and Emotional Development: In context of childhood, adolescence, adulthood: Kohlberg & Piaget's view on moral development. Problems of adolescence and old age.

BOOKS RECOMMENDED:

1. Berk, L.E. (2004): Child Development (6th Ed.) Pearson.
2. Schaffer & Kipp (2009): Developmental Psychology. Wadsworth Publishing.
3. Siegler (2009) : Developmental Psychology. Wadsworth Publishing.
4. Hurlock (2001) Developmental Psychology. McGraw Hill.
5. Brodizinsky, D.M.; Gormly A.V. & Ambron, S.R. (1986): Life Span Human Development, New Delhi, CBS Publisher.
6. Heatherington, E.M. & Parks, R.D. (1986): Child Psychology, New York: McGraw Hill.
7. Santrock, J.W. (1999): Life Span Development, New York: McGraw Hill.
8. Srivastava, A.K. (1998): Child Development: An Indian Prospective, New Delhi: NCERT.
9. Grewal, J.S. (2004): Early Childhood Education (1st Ed.)
10. Papaliya (2014) : Developmental Psychology. McGraw Hill.
11. Brodizinsky, D.M.; Gormly A.V. & Ambron, S.R. (1986): Life Span Human Development, Newdelhi, CBS Publisher.

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B.A. (Honours): Semester: **II**

Subject: Psychology Paper – VIII Subsidiary (Sociology) Society in India

Unit I

The Structure and Composition of Indian Society

Demographical Profile-Villages, Towns, Cities, Rural-Urban Linkages, Tribes, Dalits, Women and Minorities.

Unit II

Cultural and Ethnic Diversity

Historically Embedded Diversities in Respect of Language, Caste, Religious Beliefs and Practices, Cultural Patterns.

Unit III

Social Institutions, Continuity & Change

Caste, Kinship, Marriage, Religion.

Unit IV

The Challenges to Social Integration

National Integration, Secularism, Communalism, Regionalism, Displacement.

Unit V

Family: Nature, Types Functions, Recent Changes in the Family, Theory regarding the origin of family.

Recommended Readings

1. Singer,Milton and Barnard S. Cohen., , Structure and Change in Indian Society (eds.), Aldine Publishing Co., Chicago. 1968.
2. Singh, Yogendra, Modernization of Indian Tradition, Rawat Publication, Jaipur.
3. Srinivas, M.N., Caste in Modern India, Bombay, Asia Publishing House, 1962.
4. Srinivas, M.N., Social Change in Modern India, Orient Longman, Hyderabad, 1972.
5. Bose N.K., Culture and Society in India, Asia Publishing House, Bombay, 1967.
6. Bose N.K. Structure of Hindu Society, New Delhi, 1975.
7. Dubey S.C., Society in India, National Book Trust, New Delhi, 1990,

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B.A. (Honours): Semester: III

Subject: Psychology Paper – IX Environmental Studies

Unit I

Basic concept of ecosystem:

- Definition of Ecology and Ecosystem
- Structure of Ecosystem: producer, consumer and decomposer
- Function: energy flow in ecosystem, food chain, food web and ecological pyramids

Unit II

Natural Resources and its Exploitation:

- Definition
- Different types of natural resources - Uses and over exploitation and associated problems(Forest, Water, Food, Mineral, Energy, Land)

Unit III

Biodiversity and its conservation:

- Introduction
- Definition
- Levels of Biodiversity - Genetic, Species and Ecosystem Diversity
- Biographical classification of India
- Value of Biodiversity - Consumptive use, productive use, social, ethical, aesthetic and option value

Unit IV

Pollution of the Environment:

- Definition
- Causes, Effects and control measures of Air, Water, Soil, Noise, Thermal and Nuclear Hazard
- Types of pollutants
- Climate change, Acid rain, Global Warming, Ozone layer depletion and Greenhouse Effect.

Unit V

Social issue and the Environment:

- Urban Problems related to energy
- Water conservation:

- Rain water harvesting
- Water shed management

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B.A. (Honours): Semester: III

Subject: Psychology Paper – X Social Psychology

Unit I

Introduction: Nature, goals, approaches to the study and scope of social psychology; methods of social psychology-experimental, correlational, and cross-cultural research.

Unit II

Social Perception & Cognition: Perceiving ourselves and others, self-concept, self-esteem, Attribution Theory: Kelley, Jones, Davis and Weiner.

Unit III

Attitudes: Nature and Component of attitudes; Formation of attitudes. Attitude Change; Balance Theory and Cognitive Dissonance Theory. Persuasive communication, Meaning and Factors affecting.

Unit IV

Prejudice and Discrimination: Nature and Function of prejudice and discrimination; Acquisition and Reduction of prejudice and discrimination. Stereotypes: Their types and effects.

Unit V

Groups: Group structure, its function: Norms and Conformity, Leadership: Meaning and Function of a leader.

Recommended Books:

1. Brehm & Kassin S.M. (1993): Social Psychology
2. Lindzly & Aranson (1985): Handbook of Social Psychology; Vol: I & III, NDV Amerind.
3. Myers, D.G. (1988): Social Psychology, N.Y. McGraw Hill
4. Misra, G (1989): Applied Social Psychology
5. Secord K. Beckman: Social Psychology
6. Janak Pandey: Psychology in India
7. Baron & Byrne: Social Psychology
8. Hussein, Akbar, Social Psychology, Pearson.

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B.A. (Honours): Semester: III

Subject: Psychology Paper – XI Psychological Assessment

Unit I

Human Assessment: Historical Background, Nature and Scope of Human Assessment, Psychological Scaling: Types of Measurement Scales: nominal, ordinal, interval and ratio.

Unit II

Psychological Test Construction: Steps in test construction, Item writing, Item analysis; Reliability; Validity and Development of Norms.

Unit III

Questionnaire Design: Types of questions, framing questions, pre-testing, errors and biases in questionnaire data.

Unit IV

Psychological Tests: Intelligence Tests: Individual – Group, Verbal – Non verbal (Binet-Simon, Wechsler. Intelligence Scale, Adult Form)

Unit V

Assessment of Personality: Psychometric Test: 16 PF test, MMPI, Projective Tests – Rorschach and TAT. Differentiate between Psychometric and Projective Test.

Readings:

1. Anastasi, A. (1997): Psychological Testing, New York: MacMillan Co.
2. Ciminero, A.R. (Eds.) (1986): Handbook of Behavioural Assessment, New York: John Wiley.
3. Kerlinger, F.N. (1983): Foundations of Behavioural Research, New York: Surjeet Publications.
4. Freeman, F.S. (1972): Theory and Practice of Psychological Testing: New Delhi: Oxford & IBH
5. Arun Kumar Singh (2003): Tests, Measurements and Research Methods in Behavioural sciences.
6. Kaplan (2009): Psychological Testing. Wadsworth Publishing.
7. Gregory (2013): Psychological Testing. Pearson.
8. Vippin Asthana (2016): Psychological Testing. Vinod Pustak Mandir, Agrawal Publications.
9. Aiken (2003): Psychological Testing and Assessment. Boston Allyn and Bacon.
10. Rammurti,P.V. (2014) Introduction to psychological measurement, PHI .

Department of Psychology
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B.A. (Honours): Semester: III

Subject: Psychology Paper – XII Indian Society – Issues and Problems

Unit I

Structural: Poverty, Casteism, Gender inequality, illiteracy and Disparity in education.

Unit II

Familial: Dowry, Domestic Violence, Divorce, Intra and Inter generational conflicts, problems of elderly.

Unit III

Developmental: Regional Disparities, Displacement, Ecological degradation and Environmental Pollution, Consumerism, Crisis of Values.

Unit IV

Disorganization: Social Movement, Corruption, Drug Addiction, Suicide.

Kinship and Marriage: Meaning Types, functions of Kinship; Nature, types and theories of marriage

Unit V

Tribal Society: Nature and Characteristics, Distinction between Caste and Tribe, Classification of Indian Tribes. Marriage and Sex in Tribal Society.

Recommended Readings:

1. Beteille Andre, 1974, Social Inequality, OUP, New Delhi.
2. Beteille Andre, 1992, Backward Classes in Contemporary India, OUP, New Delhi.
3. Bemnan, G.D., 1979, Caste and Other Inequalities: Essays in Inequalities, Meerut Folfiore Institute.

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B.A. (Honours): Semester: **IV**
Subject: Psychology Paper – XIII

Introduction to Computers, MS-Office and Internet

Unit I

Introduction to Computers: Computer system characteristics and capabilities, types of computers, Introduction to IBM PC, Input Devices, Keyboard, Scanner and Mouse, Output Devices Impact and nonimpact printers, DMP, inkjet, Laser Printers, Storage Devices, Floppy Disks, Hard disk, CD-ROM, Introduction to Windows XP. Control Panel & Accessories.

Unit II

Windows-Operating System: Operating system and operating environment, Graphic user interface, Documents, Drives, My Computer, Setting: Control Panel & control switches, taskbar & printers, Display properties: Background and screensaver; Recycle bin, Icon & icon creation. Shortcut to programs, basic of folder and files, concept of CUT, COPY, PASTE; Clipboard, Window Explorer, Paint and word pad facility.

Unit III

MS-WORD: Introduction to MS-OFFICE & MS-WORD, Concept of File Toolbar & active window, formatted output: Font & Font size, page setup, alignment, bold, italic & underline, Paint and word pad facility.

Unit IV

MS Excel: Introduction to MS Excel, concept of file, charts, macros, forms, spreadsheet, cell toolbar and active window, row, column, Expressions and formulas, Data manipulation, filtering of data, use of financials and statistical functions.

Unit V

Power Point: Elementary idea of Power Point, Presentation in Power Point, Presentation type, output, presentation style, presentation option, On Screen presentation, view Slides, Rehearse Timing, Different types of Slides & Slides making, Setup shows.

Internet: Introduction of Internet, History, Advantages & Disadvantages, Uses, Browsers, Search Engine, Using Internet.

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B.A. (Honours): Semester: **IV**

Subject: Psychology Paper – XIV Counselling Psychology

Unit I

Counselling: Meaning, Purpose and goals of counselling. Characteristics of Counsellor. Counselling Process: Counselling relationship, rapport establishment, Counselling Interview: Steps & Techniques.

Unit II

Theories and Techniques of Counselling: Psychodynamic Approach: Freudian. Behaviour approach: Operant Conditioning and Behaviour Modification. Humanistic Approach: Client Centered Approach.

Unit III

Counselling Application: Family Counselling, Marital Counselling, Counselling in School, Career Counselling, Group Counselling.

Unit IV

Counselling for Alcoholics and Drug Abuser, Crisis intervention, Biological Therapy, Pharmacotherapy.

Unit V

Assessment in Educational Counselling and guidance: Purpose and types of test. Ability and aptitude, Attitude and Interest, Interpretation of Tests in Counselling situation.

Readings:

1. Belkin G.S. (1988): Introduction to Counselling, W.G., Brown Publishers
2. Nelson J. (1982): The Theory and Practice of Counselling Psychology, New York Holt Rinehart & Wlinston
3. Udupa K.N. (1985): Stress and its Management by Yoga, Delhi, Motilal Banarsi Das
4. Windy, D. (1988): Counselling in Action, New York, Saga Publication.
5. Gelso & Pretz: Counselling Psychology
6. S. Narayanan & Rao: Counselling Psychology
7. Baumgardner, S.R. and Crothers, M.K. (2011), Positive Psychology, Pearson Publishers.
8. Patter & Patterson: Counselling Process
9. Gladding: Counselling Psychology
10. Gelso & Pretz: Counselling Psychology
11. Corey: Counselling Psychology
12. Seligmen & Reichenberg (2014), Theories of Counselling and Psychotherapy: Systems, Strategies and Skill, PHI Publications
13. BELKIN, G.S. (1998), Introduction to Counselling (3th Ed.) Iowa: W.C. Brown
14. Burnard, P. (2009), Counselling Skills Training: Book of Activities, Viva Books, New Delhi

15. Capuzzi, D. & Gross, D.R. (2007), Counselling and Psychotherapy: T heories and Interventions (4th Ed.) New Delhi, Pearson
16. Harold L Hackney & Janine M. Bernard (2012), Professional Counseling: A Process Guide to Helping, Pearson.

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B.A. (Honours): Semester: IV

Subject: Psychology Paper – XV Organisational Behaviour

Unit I

Historical Perspective of OB: A brief historical contribution of Taylor and McGregor. Meaning and scope of OB, Models of OB, Human relations.

Unit II

Person in Organization: Personality: Definition and measurement, Motivation concept, meaning and theories - Maslow, Herzberg, and Vroom.

Unit III

Nature and types of leaderships in organization. Contingency X and Y theory and Path-Goal theory.

Unit IV

Communication in Organization: Nature, Communication Process model. Functions of Communication, Major Barrier to Affective Communication.

Unit V

Organisational Effectiveness- Nature and Elements, Approaches to organisational effectiveness, Determinants of organisational effectiveness.

Suggested Readings:

1. Robbins S.P. (2000): Organizational Behaviour: Concepts, Controversies & Application, 7th Ed., New Delhi
2. Pfeffer J. (1994): Competitive Advantage through People - Unleashing the Power of Work Force, Boston: Harward Business Scholl Press
3. Dunnette M.D. & Hough, LM. (1992): Handbook of Industrial and Organizational Psychology, 2nd Ed., Palo Alto Consulting Psycho Press
4. Cummings L, Staw B.M. (Editors) (1999): Research in Organization Behavioural, Greenwich, CTI AI Press
5. Keith & Davis, Organizational Behaviour
6. Luthans, Organizational Behaviour
7. Greenberg, J. &Baron, R.A. (2007), Behaviour in Organizations (9th Ed.), India: Dorling Kindersley
8. Griffin, R.W. & Moorhead, G. (2009), Organizational Behaviour: Managing People & Organizations, New Delhi, Biztantra Publishers
9. Landy, F.J. & CONTE, J.M. (2007), Work in the 21st century: An Introduction to Industrial and Organizational Psychology, New York, Wiley Blackwell

10. Pareek, U. (2010), Understanding Organizational Behavior, Oxford: Oxford University Press
11. Prakash, A. (2011), Organizational Behaviour (12th Ed.), New Delhi: Prentice Hall of India
12. Schermerhorn, J.R., Hunt, J.G. & Osborn, R.N. (2008) Organizational Behaviour (10th Ed) New Delhi: Wiley India Pvt. Ltd.
13. Singh, K. (2010), Organizational Behaviour: Texts & Cases, India: Dorling Kindersley
14. Sinha, J.B.P. (2008), Culture and Organizational Behaviour, New Delhi: Sage

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B.A. (Honours): Semester: IV

Subject: Psychology Paper – XVI Subsidiary (Sociology) Rural and Urban Sociology

Unit I

Rural & Urban Sociology: Meaning, Subject- matter, Scope & Importance.

Unit II

Major Studies in Rural & Urban Society in India, Agrarian Economy and relations.

Unit III

Rural Problems: Poverty, Migration, Landless Labour, bondage labour.

Unit IV

Urban Problems: Migration, Slums, Crime Against women, Unemployment.

Unit V

Planned Change for Rural Society: Community Development Programmes. Panchayat Raj System, Local Self Govt.

Recommended Readings:

1. Berch, Berberogue, (Ed.), 1992, Class, State and Development in India, New Delhi: Sage Publications.
2. Desai, A.R.(ed.). 1977, Rural Sociology in India, Bombay: Popular Prakashan.
3. Mencher, J.P., 1983, Social Anthropology of Peasantry, Part-III, OUP.
4. Radhakrishnan, P., 1989, Peasant Struggles: Land Reforms and Social Change in Malabar 1836 -1982, New Delhi: Sage Publications.
5. Beteille, Andre, 1971, Caste, Class and Power, London: University of California Press.
6. Merriott, Mckim, 1955, Village India, Chicago University Press.
7. Srinivas, M.N., 1955, India's Villages, New Delhi: Asia Publishing House.
8. Srinivas, M.N., 1962, Caste in Modern India and Other Essays, New Delhi: Asia Publishing House.
9. Srinivas, M.N., 1976, The Rememberd Village, Delhi: Oxford University Press.
10 Bailey, F.G., 1959, Caste in Economic Frontier, Bombay: Oxford University Press.

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B.A. (Honours): Semester: V
Subject: Psychology Paper – XVII Clinical Psychology

Unit I

Meaning and nature of Clinical Psychology, Scope and Function of Clinical Psychology, Problems of Clinical Psychology, Training and Education of Clinical Psychologists.

Unit II

Model of Clinical Psychology: Psychodynamic model, Behavioural model, Phenomenological model, Interpersonal model, An Integrative viewpoint towards different models.

Unit III

Clinical Intervention: Psychotherapy, Nature and Goals of Psychotherapy, Types of Psychotherapy, Models of Psychotherapy.

Unit IV

Different Therapies: Psychodynamic Therapy, Behavioural Therapy, Client Centred Therapy.

Unit V

Group Therapy, Family Therapy, Marital Therapy, Evaluation of Psychotherapy.

Readings:

1. Korchin Sheldon, J. (1988) Modern Clinical Psychology: Principles of Intervention in the Clinical and Community, SBS Publications Distributors.
2. Singh, A.K. mPprj uSnkfud euksfoKku] eksrhyky cukjlhnkl] fnYyh

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B.A. (Honours): Semester: V

Subject: Psychology Paper – XVIII Personality Psychology

Unit I

Nature and Characteristics of Personality, Integration and Disintegration of Personality, Determinants of Personality, Development of Personality.

Unit II

Assessment of Personality, Observation, Personality inventory, Interview, Projective Technique-TAT and Rorschach.

Unit III

Psychoanalytical Theory of Personality, Erik Erikson: Psychosocial Theory of Personality, A Comparative study of Freud and Erikson's Theories of Personality.

Unit IV

Allport: Trait Theory of Personality, Carl Rogers: Phenomenological Theory of Personality.

Unit V

Skinner: Behaviouristic learning theory of Personality, Albert Bandura: Social learning Theory of Personality.

Readings:

1. Liebert, R.M. and Spiegler, M.D. Personality, strategies and issues, practice Grove crliformia
2. Hall, C.S. and Lindlzey, G. (1978) Theories of Personality 3rd Ed, Newyork: J.Willey
3. Singh, A.K., O;fDrRo euksfoKku] eksrhyky cukjlhnkl] fnYyh

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B.A. (Honours): Semester: **V**

Subject: Psychology Paper – XIX Community Psychology

Unit I

Introduction: Definition of community psychology; historical development and Perspectives of Community psychology.

Unit II

Core Values: Individual and family wellness; sense of community; respect for human diversity; social justice; empowerment and citizen participation; collaboration and community strengths.

Unit III

Health Promotion: Concept of Community Mental Health, Concept of Prevention, Methods of Community Intervention and Change, Crisis Intervention, Method of Consultation: Types and Phases.

Unit IV

Community Programme for: Child and maternal health, physical challenged and old age in the Indian context, Mental Health Education.

Unit V

Interventions: Practice of Mental Health Education, Service of Non Professionals: Problems in Use of non professionals, Community health programme in India.

Readings:

1. Banerjee, A., Banerjee, R., Duflo, E., Glenneske, R., and Khenani, S. (2006) Can Information Campaign start local participation and improve outcomes ? A study of primary education in Uttar Pradesh, India, World Bank Policy Research, Working Paper No. 3967.
2. Fetterman, D.M., Kaftarian, S.J. and Wandrsman, A (Eds) (1996) Empowerment Evaluation, New Delhi: Sage Publication.
3. Kloos, B. Hill, J. Thomas, Wandersman A., Elias M.J. and Dalton, J.H. (2012) Community Psychology: Linking Individuals and Communities, Wadsworth Cengage Learning.
4. McKenzie, J.F. Pinger, R.R. and Kotecki, J.E. (2005) An introduction to community health, United States, Jones and Bartlett Publishers.
5. Mishra, G. (Ed). (2010) Psychology in India. Indian Council of Social Science Research. Dorling Kindersley (India) Pvt Ltd. Pearson Education.
6. Poland, B.D., Green, L.W. and Rootman, I (2000) Setting for Health Promotion: Linking Theory and Practice, Sage Publication, New Delhi. DSE-PSY-05 CULTURAL

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B.A. (Honours): Semester: **V**

Subject: Psychology Paper – XX Project and Viva Voce

Each student has to conduct a project in an agency/institution/organization and then after submit the project report which would be evaluated and Viva-Voce would be conducted.

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B.A. (Honours): Semester: VI

Subject: Psychology Paper – XXI Educational Psychology

Unit I

Introduction to Educational Psychology, Nature, scope and relevance of Educational Psychology, Conceptual and Theoretical perspectives in Educational Psychology: Theories of learning: Pavlov's, Thorndike's, Skinners.

Unit II

Human Diversity and Education, Characteristics of Individual Differences, Areas and Causes of Individual Differences.

Unit III

Intelligence: Nature and Characteristics, Kinds, Factors influencing intelligence, Creativity: Nature, Characteristics, Types and Dimensions.

Unit IV

Effective Teaching and Classroom Management, Characteristics of Effective Teachers, Teaching Methods, Deductive Method, Inductive Method, Kinder Garten, Montessori, Lecture and Explaining.

Unit V

Exceptionality and Special Education, Conceptualizing Exceptionality: Categorization, Education and Adjustment of Backward children, Problem children, Delinquents and Disadvantaged children.

Readings:

1. Lahey, R.B. Graham, J.E., (2000) An Introduction to Educational Psychology, 6th Ed., Tata MGraw Hill Publishers, New Delhi.
2. Slavin, R., (2008) Educational psychology: Theory into practice, (9th ed.).
3. Allyn and Bacon, Santrock John W., (2010) Educational Psychology, Inwin Professional Publishers, Delhi.
4. Woolfolk Anita (2004) Educational Psychology, 9th Edition.
5. Alyyn and Bacon, Boston, Woolfolk Anita and woolfolk Hoy Anita (2008) Educational Psychology, Pearson.

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B.A. (Honours): Semester: VI

Subject: Psychology Paper – XXII Applied Psychology

Unit I

(a) Meaning, concept and Scope/branches of Applied Psychology.

(b) Educational Psychology: Meaning, Scope of Educational Psychology: Creativity, Characteristics of Effective teachers; Intervention and Special Education for various forms of exceptional children.

Unit II

Industrial Psychology: Meaning and Scope of Industrial Psychology, Psychology of Advertising; Consumer Behaviour; Job Analysis, Personnel Selection; Work environment.

Unit III

Environmental Psychology: Meaning, General Orientation, Concept of Crowding; Effect of high density on Human, Eliminating the causes and effects of crowding.

Unit IV

Sports Psychology: Nature of Sports Psychology: Motivation, Skills and Performance; Cognitive and Social psychological dimensions of individual and team sports; Training/Coaching techniques; Role of Sports Psychologists.

Unit V

Military Psychology: Nature and scope of Military Psychology; Selection and training of military personnel; Assessment of Psychomotor, Interest, Aptitude and personality; Morale and Motivation.

Books Recommended:

1. A.P. Singh, Applied Psychology, Pearson
2. Gayle Brewer (2011), Media Psychology, Palgrave, McMillan
3. Arnold, D.L.U. & Nation, J.R. (1989), Sports Psychology, Chicago, Nalson Hall
4. Mohan, J. (1996), Recent Advances in Sports Psychology, New Delhi
5. Bell, P. Greene, T., Fisher, J., & Baum, A. (2001), Environmental Psychology, NY, Harcourt Brace
6. Gifford, R. (2007), Environmental Psychology - Principles and Practice, Optimal Books
7. Bartol, C.R. & Bartol, A.M. (2004), Introduction to Forensic Psychology, Thousand Oaks, Sage Publications

Department of Psychology
A.P.S. University, Rewa (M.P.)

B.A. (Honours): Semester: VI

Subject: Psychology Paper – XXIII Psychological Research Methods

Unit I

Science and Psychological Research

Nature of Science, Characteristics of the scientific method, Nature, characteristics and types of psychological research: Basic vs Applied Research, Theoretical vs Empirical Research, Quantitative vs Qualitative research.

Unit II

Variables:

Meaning, Definitions, Types (Independent, Dependent, Extraneous) and Control of Variables, Some Importance considerations in Selection of Variable.

Unit III

Introduction to Experimental Research

Nature and Characteristics, Method of manipulating independent variables, Types of Experimental Research, Types of Experiment.

Unit IV

Non Experimental Research

Nature and Characteristics, Distinction between Experimental and non-experimental Research, Types of non-experimental Research, Limitations of non experimental Research.

Unit V

Research Design

Nature and characteristics, Purpose of Research Design, Types of Research Design, Advantage and disadvantage of Experimental design.

Readings:

1. Anastasi A. (1988): Psychological Testing, New York, MacMillan Publication.
2. Minium E.W., King B.M., & Bear G. (1993): Statistical Reasoning in Psychology and Education. New York; John Wiley.
3. Kerlinger F.N., (1983): Foundations of Behavioural Research, New York, Surjeet Publication.
4. Freeman F.S., (1972), Theory and Practice of Psychological Testing, New Delhi, Oxford and IBH.
5. Helode, R., Psychological Research Methods
6. Kirk, C., Research in Psychology
7. Broota, K.D., Experimental Designs

Department of Psychology
A.P.S. University, Rewa (M.P.)

B.A. (Honours): Semester: **VI**

Subject: Psychology Paper – XXIV Practical and Viva Voce

1. Intelligence Test
2. Personality Test
3. Interest Test
4. Anxiety Test
5. Value Test
6. Stress Test
7. Adjustment Test
8. Achievement Test
9. Motivation Test
10. Morale Test

BACHELOR OF ARTS (B.A.) PHILOSOPHY

PROGRAMME STRUCTURE
(As per NEP 2020 & CBCS Ordinance 14 A)

2nd Year

SEMESTER – III					
Course Code & Name	**Course Type**	**Theory Paper**	**Internal Assessment**	**Maximum Marks**	**Credits**
301 Western Philosophy -I	Major Core	60	40	100	6
302 Political History of Ancient North India	Minor Core	60	40	100	6
303 Gandhian Philosophy*	GE	60	40	100	4
304 Basic of Computer and Information Technology	SE (FC)	60	40	100	4
SEMESTER TOTAL				**400**	**20**
CUMULATIVE TOTAL				**400**	**20**

SEMESTER – IV					
Course Code & Name	**Course Type**	**Theory Paper**	**Internal Assessment**	**Maximum Marks**	**Credits**
401 Western Philosophy-II	Major Core	60	40	100	6
402 Political History of Ancient South India	Minor Core	60	40	100	6
403 Philosophy of Education *	GE	60	40	100	4
404 Moral Values and Personality Development	SE (FC)	60	40	100	4
SEMESTER TOTAL				**400**	**20**
CUMULATIVE TOTAL				**800**	**40**

GE: Generic Elective **SE: Skill Enhancement** **FC: Foundation Course**

*Students may choose this course as a **Generic Elective** or may choose a Generic Elective Course offered in other UTD's at the same level or may choose a Course offered by MOOC's through SWAYAM.

The student will be awarded Diploma in Philosophy on successful completion of second year.

Credit Distribution as per the Ordinance 14 A

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		Main Faculty (as per prerequisite)			Any Faculty	Skill Enhancement Course (SEC)	Ability Enhancement Course (AEC)	Field Projects/ internship/ apprenticeship /community engagement & service	Credits	Qualification Title (Credits Requirements)
		Subject I		Subject II	Subject III					
Level	Sem	Major		Minor	Generic Elective Course	Vocational Course		#Inter/Intra Faculty		
		Core	DSE							
Level 5	1	6		6	4	-	4	-	6+6+4+4 =20	(40) Undergraduate Certificate in Main Faculty
	2	6		6	4	-	4	-	6+6+4+4 =20	
Level 6	3	6		6	4	4	-	-	6+6+4+4 =20	(80) Undergraduate Diploma in Main Faculty
	4	6		6	4	4	-	-	6+6+4+4 =20	
Level 7	5	6	4	-	-	4	-	6	6+4+4+6 =20	(120) Bachelor Degree in Main Faculty
	6	6	4+4	-	-	-	-	6	6+4+4+6 =20	
Level 8	7	6	4	4 Research Methodology	-	-	-	6	4+4+4+6 =20	(160) Bachelor Degree (Honours/Research) in Main Faculty
	8	6	-	4	-	-	-	10	6+4+10 = 20	
Total		48	16	32	16	12	8	28	160 Credits	

बी.ए. पाठ्यक्रम (दर्शनशास्त्र) / B.A. Programme (Philosophy)

सेमेस्टर–III/ Semester - III

मुख्य विषय / Major Core -301

पाश्चात्य दर्शन–I
Western Philosophy-I

Credits- 06
Max. Marks - 60
Min. Marks -

उद्देश्य	इस पाठ्यक्रम का उद्देश्य विद्यार्थियों को ग्रीक दर्शन के महत्वपूर्ण दार्शनिकों के सिद्धान्तों से परिचित कराना है।	
Objective	The objective of teaching of this course would be able to familiarize the students with the philosophical theories and tenets of very important Greek Thinkers.	
इकाई	विषय	व्याख्यान की संख्या
इकाई-I	**पाश्चात्य दर्शन** 1. पाश्चात्य दर्शन का स्वरूप 2. ग्रीक दर्शन का स्वरूप 3. मध्यकालीन दर्शन का स्वरूप 4. आधुनिक दर्शन का स्वरूप	18 घण्टे
Unit-I	Western Philosophy 1. Nature of Western Philosophy 2. Nature of Greek Philosophy 3. Nature of Medieval Philosophy 4. Nature of Modern Philosophy	18 Hours
इकाई-II	**ग्रीक दर्शन** 1. आयोनिक सम्प्रदाय (थेलीज, एनेक्जिमेण्डर एवं एनेक्जिमेनीज) 2. पाइथागोरस 3. इलियाई सम्प्रदाय (जेनोफेनीज, पार्मेनाइडीज, जेनो एवं मेलिसस), हेरेक्लाइटस एवं एम्पेडोक्लीज 4. ल्यूसिपस और डिमॉक्रिटस, एनेक्जोगोरस एवं प्रोटागोरस	18 घण्टे
Unit-II	**Greek Philosophy** 1. Ionic School- (Thales, Anaximander and Anaximanies) 2. Pythagoras 3. Eleatic School (Zenophanes, Parmemides, Zeno and Melisus), Hereclitus and Empedocles 4. Leusipus and Democritus, Anaxagoras and Protagoras	18 Hours
इकाई-III	**सुकरात और प्लेटो** 1. सुकरात की पद्धति एवं नीति मीमांसा 2. प्लेटो–ज्ञान मीमांसा 3. प्लेटो–विज्ञानवाद, विज्ञान की विशेषताएँ, विज्ञान और वस्तु में सम्बन्ध 4. प्लेटो–परम शुभ का विज्ञान	18 घण्टे
Unit-III	Socrates and Plato 1. Socratic Methods and Ethics 2. Plato-Epistemology 3. Plato- Idealism, Characteristics of Idea, Relation in Ideas and Objects 4. Plato-Idia of the Good	18 Hours

इकाई-IV	अरस्तू 1. विज्ञानवाद की अलोचना 2. कारणता सिद्धान्त, द्रव्य एवं आकार 3. नैतिक सद्गुण–स्वरूप एवं विशेषताएँ 4. मध्यममार्ग का सिद्धान्त एवं विशेषताएँ	18 घण्टे
Unit-IV	Aristotle 1. Criticism of Idealism 2. Theory of Causality, Matter and Form 3. Moral Virtues-Nature and Characteristics 4. Doctrine of Middle-path and Characteristics	18 Hours
इकाई-V	मध्ययुगीन दर्शन 1. मध्ययुगीन दर्शन की विशेषताएँ 2. संत ऑगस्टाइन– ज्ञान सिद्धान्त एवं अशुभ की समस्या 3. संत एन्सेल्म– ईश्वर अस्तित्व के लिए प्रमाण 4. थॉमस एक्वीनस– ईश्वर विचार, आस्था एवं तर्क में भेद	18 घण्टे
Unit-V	Medieval Philosophy 1. Characteristics of Medieval Philosophy 2. Saint Augustine - Theory of Knowledge and Problem of Evil 3. Saint Anselm- Argument for Existence of God 4. Thomas Aquinas- Thought of God, Difference in Faith and Reason	18 Hours
Suggested Readings :	1. चन्द्रधर शर्मा, पाश्चात्य दर्शन, मोतीलाल बनारसीदास, दिल्ली, 1997 2. डॉ. बी.एन. सिंह, पाश्चात्य दर्शन, स्टूण्डेट्स फ्रेण्ड्स एण्ड कम्पनी, वाराणसी, 1973 3. याकूब मसीह, पाश्चात्य दर्शन का समीक्षात्मक इतिहास, मोतीलाल बनारसीदास, नई दिल्ली, 2005 4. जगदीश सहाय श्रीवास्तव, आधुनिक पाश्चात्य दर्शन का वैज्ञानिक इतिहास, पुस्तक स्थान, गोरखपुर, 1973 5. Frank Thilly, History of Western Philosophy, Central Book Depot, Allahabad, 1975 6. Stace, W.T., A Critical History of Greek Philosophy Macmillan, New Delhi, 1985 7. Masih, Y., A Critical History of Western Philosophy, Motilal Banarasidas, Delhi, 1994	
परिलब्धि	यह पाठ्यक्रम विद्यार्थियों को ग्रीक दर्शन के सभी सिद्धान्तों को समझने में सहायक होगा।	
Outcomes	**This course will help the students to understand all kinds of theories of Greek Philosophy.**	

बी.ए. पाठ्यक्रम (दर्शनशास्त्र) /B.A. Programme (Philosophy)

सेमेस्टर–III Semester - III

गौण विषय / Miner Core -302

प्राचीन उत्तर भारत का राजनैतिक इतिहास

Political History of Ancient North India

Credits- 06
Max. Marks - 60
Min. Marks -

उद्देश्य	इस पाठ्यक्रम का उद्देश्य विद्यार्थियों को प्राचीन उत्तर भारत के राजनैतिक इतिहास से परिचित कराना है।	
Objective	The objective of this course is to teach the students the political history of Ancient North India.	
इकाई	**विषय**	**व्याख्यान की संख्या**
इकाई-I	**षोडष महाजनपद एवं मगध साम्राज्य काल** 1. षोडष महाजनपद 2. प्रमुख गणराज्य 3. मगध साम्राज्य – हर्यक वंश (बिम्बिसार, अजातशत्रु, उदायिन), शिशुनाग वंश (कालाशोक), नन्द वंश (महापद्मनन्द, धनान्द) 4. सिकन्दर का आक्रमण तथा उसका प्रभाव, झेलम का युद्ध	18 घण्टे
Unit-I	**Period of Shodash Mahajanapada and Magadh Empire** 1. Shodasha Mahajanapada 2. Major Republics 3. Magadh Empire - Haryak Dynasty (Bimbisara, Ajatashatru, Udayina), Shishunaga Dynasty (Kalashoka), Nanda Dynasty (Mahapadmananda, Dhanananda) 4. Alexender's Invasion and it's Effect, Battle of Jhelum	18 Hours
इकाई-II	**मौर्य काल** 1. चन्द्रगुप्त मौर्य – जीवन परिचय, उपलब्धियाँ 2. अशोक – जीवन परिचय, कलिंग का युद्ध एवं परिणाम, धम्म नीति 3. कौटिल्य अर्थशास्त्र – एक संक्षिप्त परिचय, राज्य का सप्तांग सिद्धान्त 4. मौर्यकाल – शासन व्यवस्था	18 घण्टे
Unit-II	**Mourya Period** 1. Chandragupta Mourya - Life Sketch, Achievements 2. Ashoka - Life Sketch, Kalinga's War and result, Dhamma Policy 3. Kautilya's Arthashastra - A Brief Introduction, Saptanga Theory of State 4. Mourya Period - Administration	18 Hours
इकाई-III	**मौर्योत्तर काल** 1. शुंग वंश – पुष्यमित्र शुंग 2. शुंग वंश – संस्कृति, कला एवं स्थापत्य 3. कुषाण राजवंश – कनिष्क का शासन प्रबन्ध 4. गुप्त काल के उदय के पूर्व भारत की राजनैतिक दशा	18 घण्टे
Unit-III	**Post Mourya Period** 1. Shunga Dynasty - Pushyamitra Shunga 2. Shunga Dynasty - Culture, Art and Architecture 3. Kushana Dynasty - Administration of Kanishka	18 Hours

	4. India before the rise of the Gupta Period	
इकाई-IV	**गुप्त काल** 1. चन्द्रगुप्त प्रथम – राजनैतिक उपलब्धियाँ 2. समुद्रगुप्त – राजनैतिक उपलब्धियाँ 3. चन्द्रगुप्त द्वितीय 'विक्रमादित्य' एवं कुमारगुप्त प्रथम 4. गुप्त साम्राज्य के पतन के कारण	18 घण्टे
Unit-IV	**Gupta Period** 1. Chndragupta I - Political Achievements 2. Samudragupta - Political Achievements 3. Chandragupta II 'Vikramaditya' and Kumargupta I 4. Causes of Downfall of Gupta Empire	18 Hours
इकाई-V	**हर्ष एवं राजपूत राजवंश** 1. वर्धन वंश की उत्पत्ति एवं विकास 2. गुर्जर–प्रतिहार, नागभट्ट एवं मिहिरभोज 3. शाकम्भरी का चहमान वंश – विग्रहराज चतुर्थ, पृथ्वीराज तृतीय 4. कल्चुरी राजवंश – शंकरगण, गांगेयदेव एवं लक्ष्मीकर्ण	18 घण्टे
Unit-V	**Harsha and Rajputa Dynasty** 1. Origin and Development of Vardhana Dynasty 2. Gurjar-Pratihara, Nagbhatta and Mihirbhoj 3. Chahman Dynesty of Shakambhari – Vigraharaj IV, Prithviraj III 4. Kalchuri Dynasty - Shankargana, Gangeyadeo and Laxmikarna	18 Hours
Suggested Readings :	1. विमलचन्द्र पाण्डेय, प्राचीन भारत का इतिहास, सेन्ट्रल पब्लिशिंग हाउस, इलाहाबाद, 2016 2. जयशंकर मिश्र, प्राचीन भारत का सामाजिक इतिहास, बिहार हिन्दी ग्रन्थ अकादमी, 1974 3. के.सी. श्रीवास्तव, प्राचीन भारतीय इतिहास एवं संस्कृति, यूनाइटेड बुक डिपो, 2000 4. प्रो. महेश चन्द्र श्रीवास्तव, प्राचीन भारत का इतिहास (पूर्व–ऐतिहासिक काल से 320 ई. तक) शिवांक प्रकाशन, नई दिल्ली, 2020 5. रोमिला थापर, भारत का इतिहास, राजकमल प्रकाशन, नई दिल्ली, 2000 6. Prof. Mahesh Chandra Shrivastava - Ancient History of Indian, Manisha Publication, Delhi, 2018	
परिलब्धि	विद्यार्थी पाठ्यक्रम के अध्ययनोपरान्त प्राचीन उत्तर भारत के राजनैतिक इतिहास से परिचित होकर वर्तमान राजनैतिक व्यवस्था का तुलनात्मक अध्ययन कर सकेंगे।	
Outcomes	This Course will encourage the students for comparative study in political history of Ancient North India and Modern Political system.	

बी.ए. पाठ्यक्रम (दर्शनशास्त्र) / B.A. Programme (Philosophy)

सेमेस्टर – III / Semester - III
वैकल्पिक विषय / Generic Elective (G.E.) – 303

Credits- 04
Max. Marks - 60
Min. Marks -

गाँधी दर्शन
Gandhian Philosophy

उद्देश्य	यह पाठ्यक्रम गांधी के जीवन और विचारों पर केंद्रित है। यह जीवन के सभी महत्वपूर्ण मुद्दों के बारे में उनके विचारों को स्पर्श करता है। इसमें शामिल विषय गांधीवाद की दार्शनिक पृष्ठभूमि, गांधीवाद की धार्मिक पृष्ठभूमि, गांधी के दार्शनिक विचार, गांधी के आर्थिक विचार आदि हैं।	
Objective	This course focuses on the life and thoughts of Gandhi. It touches upon his ideas regarding all important issues of life. The topics that it covers is Philosophical background of Gandhism, Religious background of Gandhism, Philosophical thoughts of Gandhi, economic thoughts of Gandhi and so on.	
इकाई	**विषय**	**व्याख्यान की संख्या**
इकाई-I	**गाँधी जी** 1. जीवन परिचय 2. विभिन्न धर्मों / मतों का प्रभाव 3. गाँधीवाद का प्रयोजन 4. गाँधीवाद की प्रासंगिकता	12 घण्टे
Unit-I	**Gandhi ji** 1. Life sketch 2. Influence of Different Religions/Thoughts 3. Purpose of Gandhism 4. Relevance of Gandhism	12 Hours
इकाई-II	**सामाजिक चिन्तन** 1. रामराज्य 2. वर्णव्यवस्था 3. स्वदेशी 4. सर्वोदय	12 घण्टे
Unit-II	**Social Thoghts** 1. Ramrajya 2. Varna-vyavastha 3. Swadeshi 4. Sarvodaya.	12 Hours
इकाई-III	**राजनैतिक चिन्तन** 1. विकेन्द्रीकरण 2. ग्रामीण स्वराज 3. राज्य विहीन प्रजातन्त्र 4. सत्याग्रह	12 घण्टे
Unit-III	Political Thoughts 1. Decentralization 2. Village Swaraj 3. Stateless Democracy 4. Satyagrah	12 Hours

इकाई-IV	**आर्थिक चिन्तन** 1. मशीनी युग का विरोध 2. ग्रामीण कुटीर उद्योग 3. न्यास का सिद्धान्त 4. आर्थिक समाजवाद	12 घण्टे
Unit-IV	**Economic Thoughts** 1. Resist Machine Era 2. Rural Cottage Industries 3. Doctrine of Trusteeship 4. Economic Socialism	12 Hours
इकाई-V	धार्मिक एवं दार्शनिक चिन्तन 1. सर्वधर्म समभाव 2. साधन और साध्य 3. सत्य एवं ईश्वर 4. एकादशव्रत	12 घण्टे
Unit-V	Religious and Philosophical Thoughts 1. Sarvadharmasamabhava 2. Means and Ends 3. Truth and God 4. Ekadashvrata	12 Hours
Suggested Readings :	1. बसन्त कुमार लाल, समकालीन भारतीय दर्शन, मोतीलाल बनारसीदास, दिल्ली, 1993 2. नन्द किशोर देवराज, भारतीय दर्शन, उत्तर प्रदेश हिन्दी ग्रन्थ अकादमी, लखनऊ, 1975 3. लक्ष्मी सक्सेना, समकालीन भारतीय दर्शन, उत्तर प्रदेश हिन्दी संस्थान, लखनऊ, 2002 4. डॉ. ए. अवस्थी एवं डॉ. आर. के. अवस्थी, भारतीय राजनीतिक चिन्तन, रिसर्च पब्लिकेशन्स, जयपुर, 2001 5. N. K. Bose, Studies in Gandhism, Second Edition, Indian Association Publishing Co. Calcutta, 1947 6. D. M. Dutta, The Philosophy of Mahatma Gandhi, University of Calcutta, 1968 7. M. K. Gandhi, An Autobiography or the Story of my Experiments with Truth, Navajivan Pub. House, Ahmedabad, 1948	
परिलब्धि	यह पाठ्यक्रम विद्यार्थियों को संक्षेप में गांधीवाद को जानने में मदद करेगा और उन्हें इस क्षेत्र में आगे के अध्ययन के लिए प्रेरित करेगा।	
Outcomes	It will help students know Gandhism in a nutshell an induce them for further study in this field.	

बी.ए. पाठ्यक्रम (दर्शनशास्त्र) /B.A. Programme (Philosophy)
सेमेस्टर – III/ Semester - III
आधार पाठ्यक्रम / Skill Enhancement - S.E. (FC) -304
कम्प्यूटर एवं सूचना तकनीकी का आधार
Basic of Computer and Information Technology

Credits- 04
Max. Marks - 60
Min. Marks -

उद्देश्य	इस पाठ्यक्रम का उद्देश्य विद्यार्थियों को कम्प्यूटर तथा सूचना तकनीकी के प्रारम्भिक ज्ञान से परिचित कराना है।	
Objective	The objective of this course is to teach the students the basic knowledge of Computer and Information Technology.	
इकाई	**विषय**	**व्याख्यान की संख्या**
इकाई-I	**कम्प्यूटर** 1. इतिहास, कम्प्यूटर की पीढ़ियाँ, विशेषताएँ, क्षमता और सीमाएँ 2. कम्प्यूटर का वर्गीकरण, डिजिटल कम्प्यूटर के प्रकार, हार्डवेयर, सॉफ्टवेयर, सॉफ्टवेयर के प्रकार 3. कम्प्यूटर भाषाओं की पीढ़ियाँ, उच्चस्तरीय एवं निम्नस्तरीय भाषाएँ 4. ट्रान्सलेटर के प्रकार, कम्प्यूटर सिस्टम के घटक	12 घण्टे
Unit-I	**Computer** 1. History, Generations of Computer, Characteristics, Capabilities and Limitations 2. Classification of Computers, types of Digital computer Hardware, Software, Types of software 3. Generations of Computer languages, High and low level languages 4. Types of Translator, Components of Computer System	12 Hours
इकाई-II	**डिवाइस का परिचय** 1. विभिन्न इनपुट/आउटपुट डिवाइस का परिचय 2. की–बोर्ड, माऊस, एम.आई.सी.आर., ओ.सी.आर., ओ.एम.आर., बारकोड, स्कैनर 3. वी.डी.यू.प्लॉटर, इम्पैक्ट और नॉन–इम्पैक्ट प्रिन्टर 4. स्टोरेज इकाई – बिट्स एवं बाइट्स, प्रायमरी एवं सेकेण्डरी मेमोरिज	12 घण्टे
Unit-II	Introduction of devices 1. Introduction of various input/output devices 2. Keyboard, Mouse, MICR, OCR, OMR, Barcode, Scanner 3. VDU, Plotter, Impact and Nonimpact printers 4. Storage units - Bits and Bytes, Primary and Secondary Memories	12 Hours
इकाई-III	**विन्डोज** 1. विन्डोज : परिचय, विंडोज डेस्कटॉप 2. स्टार्ट बटन, टास्कबार, प्रोग्राम तथा विंडोज के बीच स्विच करना, फाइल मैनेज करना, फोल्डर्स एवं ऑब्जेक्ट्स 3. विंडोज एक्सप्लोरर, शॉर्ट–कट बनाना, कन्ट्रोल पैनल, विन्डोज एसेसरीज : पेन्ट, ब्रश, वर्ड पैड 4. विंडोज को कस्टमाइज करना, इन्टरनेट एक्सप्लोरर	12 घण्टे
Unit-III	**Windows**	12 Hours

	1. Windows : Introduction, windows desktop 2. Start button, taskbar, switching between programs and windows, managing files, folders and objects 3. Windows explorer, creating shortcuts, control panel, windows accessories : paint, brush, word pad 4. Windows customizing, Internet Explorer	
इकाई-IV	**एम.एस.वर्ड** 1. हेडर, फुटर, एन्डनोट्स, फुटनोट्स, टैब्स, टेबल्स 2. सॉर्टिंग के साथ कार्य करना, ग्राफिक्स के साथ कार्य करना – ग्राफिक्स इम्पोर्टिंग 3. ड्रॉईंग ऑब्जेक्ट्स, टेक्स्ट ड्रॉईंग (वर्ड आर्ट), ड्राइंग आब्जेक्ट का प्रयोग करके पिक्चर रोटेटिंग एवं ऑब्जेक्ट फ्लीपींग 4. स्पेलिंग और ग्रामर चेकर, ऑटो करेक्ट, ऑटो टेक्स्ट, क्रिएटिंग टेबल्स, मेलमर्ज	12 घण्टे
Unit-IV	**MS WORD** 1. Headers, Footers, Endnotes, Footnotes, tabs, tables 2. Working with sorting, Working with graphics-Importing graphics 3. Drawing objects, Text in Drawings (Word Art), Pictures using Drawing objects, Rotating and Flipping Objects 4. Spelling and Grammar Checker, Auto Correct, Auto Text, Creating Tables, Mailmerge	12 Hours
इकाई-V	**एम.एस. पॉवर प्वाइंट** 1. प्रेजेन्टेशन बनाना, ऑटो कॅटेन्ट विजार्ड, एडिटिंग स्लाइड्स 2. पॉवर प्वाइंट में टेक्स्ट के साथ काम करना, फॉरमेटिंग एवं एलाइनिंग टेक्स्ट, पॉवर प्वाइंट में ग्राफिक्स के साथ कार्य करना 3. इमेज इम्पोर्ट करना एवं पॉवर प्वाइंट में ड्रॉइंग, ऑर्गनाइजेशनल चार्ट तैयार करना 4. पॉवर प्वाइंट प्रेजेनटेशन में क्लिप आर्ट एवं पिक्चर फोटोज़ इन्सर्ट करना, पॉवर प्वाइंट में एक्सल चार्ट्स, वर्ड से टेबल इन्सर्ट करना	12 घण्टे
Unit-V	**MS POWERPOINT** 1. Creating presentations, Auto content wizard, editing slides 2. Working with Text in Power Point, Formatting and Aligning Text, Working with graphics in Power Point 3. Importing images and drawing in power point, creating organizational charts 4. Inserting clip arts & picture/photos in Power Point Presentation, Excel Charts in Power Point, Inserting Table from Word	12 Hours
Suggested Readings :	1. Sinha, P.K., Computer Fundamentals, BPB Publ. 2. Rapidex Computer Courses 3. Jain, Satish, Introduction to Computer Science, BPB Publ. 4. Mansfield R, The Compact guide to MS-OFFICE, BPB 5. Mansfield R, word 6 for window quick & easy reference, tech.	
परिलब्धि	**इस पाठ्यक्रम के अध्ययनोपरांत विद्यार्थी कम्प्यूटर पर कार्य करने में सक्षम हो सकेंगे।**	
Outcomes	The students, after their study, will be able to work on Computer.	

बी.ए. पाठ्यक्रम (दर्शनशास्त्र) / B.A. Programme (Philosophy)

सेमेस्टर–IV/Semester - IV
मुख्य विषय / Major Core -401
पाश्चात्य दर्शन–II
Western Philosophy-II

Credits- 06
Max. Marks - 60
Min. Marks -

उद्देश्य	इस पाठ्यक्रम का उद्देश्य विद्यार्थियों को आधुनिक पाश्चात्य दार्शनिकों यथा, डेकार्ट, स्पिनोजा, लाइब्नीत्ज, लॉक, बर्कले और ह्यूम के विचारों से परिचित कराना है।	
Objective	**The objective of this course is to teach the students the principles of modern western thinkers i.e. Descartes, Spinoza, Leibnitz, Locke, Berkeley and Hume.**	
इकाई	**विषय**	**व्याख्यान की संख्या**
इकाई-I	**आधुनिक युग** 1. मध्ययुग की समीक्षा एवं आधुनिक युग की विशेषताएँ 2. पुनर्जागरण 3. धार्मिक आन्दोलन एवं मानवतावाद 4. आधुनिक दर्शन की धाराएँ – बुद्धिवाद एवं अनुभववाद	18 घण्टे
Unit-I	**Modern Era** 1. Criticism of Medieval Era and characteristics of modern Era 2. Renaissance 3. Religious Movement and Humanism 4. Thought of Modern Era - Rationalism and Empiricism	18 Hours
इकाई-II	**बुद्धिवाद** 1. देकार्त – द्रव्य की अवधारणा, सन्देह पद्धति, मैं सोचता हूँ, इसलिए मैं हूँ, मन–शरीर की समस्या 2. स्पिनोजा – देकार्त के द्रव्य की अवधारणा का खण्डन, द्रव्य की अवधारणा, गुण और पर्याय 3. स्पिनोजा – सर्वेश्वरवाद, समानांतरवाद 4. लाइब्नीत्ज – चिद्‌णुवाद, पूर्वस्थापित सामंजस्य का सिद्धान्त	18 घण्टे
Unit-II	**Rationalism** 1. Descartes - Concept of Substances, Method of Doubt, I think therefore I am (Cogeto Ergo Sum), Problem of Mind and Body 2. Spinoza - Refutation of Concept of Substance of Descartes, Concept of substance, Attributs and Modes 3. Spinoza - Pantheism, Parallelism 4. Leibnitz - Monadology, Theory of Pre-Established Harmony	18 Hours
इकाई-III	**अनुभववाद** 1. जॉन लॉक – जन्मजात प्रत्ययों का खण्डन, द्रव्य, मूलगुण एवं उपगुण 2. जॉर्ज बर्कले – जड़ द्रव्य का खण्डन, सत्ता अनुभवमूलक है, आत्मनिष्ठ प्रत्ययवाद 3. डेविड ह्यूम – अनुभववाद की पराकाष्ठा, तात्त्विक सत्ताओं एवं कारणता का खण्डन 4. डेविड ह्यूम – संदेहवाद	18 घण्टे
Unit-III	**Empiricism** **1.** John Locke - Refutation of Innate Ideas, Substance, Primary and Secondary Qualities **2.** George Berkeley - Refutation of Materialism, Esse Est	18 Hours

	Percipi, Subjective Idealism **3.** David Hume - Extreme of Empiricism, Refutation of Metaphysical existence and Causality **4.** David Hume -Skepticism	
इकाई-IV	**समीक्षावाद** 1. इमान्युएल कान्ट – समीक्षावाद 2. देश और काल 3. संश्लेषणात्मक प्रागनुभविक निर्णय 4. अज्ञेयवाद	18 घण्टे
Unit-IV	**Criticism** 1. Immanual Kant - Criticism 2. Space and Time 3. Apriori synthetic Judgment 4. Agnosticism	18 Hours
इकाई-V	**जार्ज विल्हम फ्रेडरिक हेगल का दर्शन** 1. निरपेक्ष प्रत्ययवाद 2. कारण और तर्क 3. द्वन्द्व न्याय 4. आत्मा का प्रत्यय	18 घण्टे
Unit-V	Philosophy of George Wilhelm Friedrich Hegel 1. Absolute Idealism 2. Cause and Reason 3. Dialectics 4. Idea of Mind	18 Hours
Suggested Readings :	**1.** चन्द्रधर शर्मा, पाश्चात्य दर्शन, मोतीलाल बनारसीदास, दिल्ली, 1997 **2.** डॉ. बी.एन. सिंह, पाश्चात्य दर्शन, स्टूण्डेट्स फ्रेण्ड्स एण्ड कम्पनी, वाराणसी, 1973 **3.** याकूब मसीह, पाश्चात्य दर्शन का समीक्षात्मक इतिहास, मोतीलाल बनारसीदास, नई दिल्ली, 2005 **4.** जगदीश सहाय श्रीवास्तव, आधुनिक पाश्चात्य दर्शन का वैज्ञानिक इतिहास, पुस्तक स्थान, गोरखपुर, 1973 **5.** Frank Thilly, History of Western Philosophy, Central Book Depot, Allahabad, 1975 **6.** Stace, W.T.: A Critical History of Greek Philosophy Macmillan, New Delhi, 1985 **7.** Masih, Y. - A Critical History of Western Philosophy, Motilal Banarasidas, Delhi, 1994	
परिलब्धि	यह पाठ्यक्रम आधुनिक पाश्चात्य दार्शनिक सिद्धान्तों को समझने में सहायक होगा।	
Outcomes	**This course will help to students understanding the principles of Modern western Philosophers.**	

बी.ए. पाठ्यक्रम (दर्शनशास्त्र) /B.A. Programme (Philosophy)

सेमेस्टर–IV Semester - IV

गौण विषय / Miner Core -402

प्राचीन दक्षिण भारत का राजनैतिक इतिहास

Political History of Ancient South India

Credits- 06
Max. Marks - 60
Min. Marks -

उद्देश्य	इस पाठ्यक्रम का उद्देश्य विद्यार्थियों को प्राचीन दक्षिण भारत के राजनैतिक इतिहास से परिचित कराना है।	
Objective	The objective of this course is to teach the students the political history of Ancient South India.	
इकाई	**विषय**	**व्याख्यान की संख्या**
इकाई-I	**संगम युग** 1. संगम साहित्य 2. चोल, चेर, पाण्ड्य राजवंश 3. संगमयुग – संस्कृति एवं सामाजिक दशा 4. संगम युग – राजनैतिक एवं शासन व्यवस्था	18 घण्टे
Unit-I	**Sangam Period** 1. Sangam Literature 2. Chol, Cher, Pandya Dynasty 3. Sangam Period - Culture and Social Condition 4. Sangam Period - Polytical and Administrative System	18 Hours
इकाई-II	**चालुक्य राजवंश** 1. वातापी का चालुक्य राजवंश 2. कल्याणी का चालुक्य राजवंश 3. वेंगी का चालुक्य राजवंश 4. चालुक्यकालीन राजनैतिक एवं शासन व्यवस्था	18 घण्टे
Unit-II	**Chalukya Dynasty** 1. Chalukya Dynasty of Vatapi 2. Chalukya Dynasty of Kalyani 3. Chalukya Dynasty of Vengi 4. Chalukya Period - Political and Administrative System	18 Hours
इकाई-III	**राष्ट्रकूट राजवंश** 1. साधन, उत्पत्ति एवं मूल स्थान 2. विभिन्न राष्ट्रकूट शाखाएँ 3. मान्यखेट का राष्ट्रकूट राजवंश 4. राष्ट्रकूटकालीन राजनैतिक एवं शासन व्यवस्था	18 घण्टे
Unit-III	**Rashtrakuta Dynasty** 1. Source, Origin and Place 2. Various Branches of Rashtrakuta 3. Rashtrakuta Dynasty of Manyakheta 4. Rashtrakuta Period - Political and Administrative System	18 Hours
इकाई-IV	**पल्लव राजवंश** 1. साधन, उत्पत्ति एवं मूल स्थान 2. कांची के पल्लव शासक 3. पल्लव काल – संस्कृति, कला एवं स्थापत्य 4. पल्लव काल – राजनैतिक एवं शासन व्यवस्था	18 घण्टे
Unit-IV	**Pallava Period** 1. Source, Origin and Place 2. Pallava Ruler of Kanchi	18 Hours

	3. Pallava Period - Culture, Art and Architecture 4. Pallava Period - Political and Administrative System	
इकाई-V	**चोल राजवंश** 1. साधन एवं प्रारम्भिक इतिहास 2. चोल राज्य का स्वरूप 3. चोल काल – संस्कृति, कला एवं स्थापत्य 4. चोल काल – राजनैतिक एवं ग्राम प्रशासन	18 घण्टे
Unit-V	**Chola Dynasty** 1. Source and Early History 2. Nature of Chola State 3. Chola Period - Culture, Art and Architecture 4. Chola Period - Political and Village Administration	18 Hours
Suggested Readings :	1. विमलचन्द्र पाण्डेय, प्राचीन भारत का इतिहास, सेन्ट्रल पब्लिशिंग हाउस, इलाहाबाद, 2016 2. जयशंकर मिश्र, प्राचीन भारत का सामाजिक इतिहास, बिहार हिन्दी ग्रन्थ अकादमी, 1974 3. के.सी. श्रीवास्तव, प्राचीन भारतीय इतिहास एवं संस्कृति, यूनाइटेड बुक डिपो, 2000 4. प्रो. महेश चन्द्र श्रीवास्तव, प्राचीन भारत का इतिहास (पूर्व–ऐतिहासिक काल से 320 ई. तक) शिवांक प्रकाशन, नई दिल्ली, 2020 5. रोमिला थापर, भारत का इतिहास, राजकमल प्रकाशन, नई दिल्ली, 2000 6. Prof. Mahesh Chandra Shrivastava - Ancient History of Indian, Manisha Publication, Delhi, 2018	
परिलब्धि	विद्यार्थी पाठ्यक्रम के अध्ययनोपरान्त प्राचीन दक्षिण भारत के राजनैतिक इतिहास से परिचित होकर वर्तमान राजनैतिक व्यवस्था का तुलनात्मक अध्ययन कर सकेंगे।	
Outcomes	This Course will encourage the students for comparative study in political history of Ancient South India and Modern Political system.	

बी.ए. पाठ्यक्रम (दर्शनशास्त्र) / B.A. Programme (Philosophy)

सेमेस्टर–IV / Semester - IV

वैकल्पिक विषय/ Generic Elective (G.E.) - 403

शिक्षा दर्शन

Philosophy of Education

Credits- 04
Max. Marks - 60
Min. Marks -

उद्देश्य	इस पाठ्यक्रम का उद्देश्य विद्यार्थियों को शिक्षा दर्शन की अवधारणा से परिचित कराना है।	
Objective -	The objective of this course is to teach the students the Concept of Education philosophy.	
इकाई	**विषय**	**व्याख्यान की संख्या**
इकाई-I	**शिक्षा दर्शन** 1. शिक्षा दर्शन – स्वरूप, क्षेत्र एवं कार्य 2. शिक्षा का स्वरूप 3. शिक्षा के प्रकार 4. शिक्षा एवं दर्शन	12 घण्टे
Unit-I	**Philosophy of Education** 1. Philosophy of Education - Nature, Scope and Function 2. Nature of Education 3. Types of Education 4. Education and Philosophy	12 Hours
इकाई-II	**उपनिषद् दर्शन एवं शिक्षा** 1. उपनिषद् दर्शन – सामान्य परिचय 2. उपनिषद् दर्शन के मूल सिद्धान्त 3. उपनिषद् दर्शन और शिक्षा 4. शिक्षा दर्शन के रूप में उपनिषद् दर्शन का मूल्यांकन	12 घण्टे
Unit-II	Upnishad Darshan and Education 1. Upnishad Darshan - General Introduction 2. Fundamentals of Upnishad Darshan 3. Upnishad Darshan and Education 4. Evaluation of Upanishad Darshan as a Philosophy of Education	12 Hours
इकाई-III	**समाज एवं शिक्षा** 1. समाज का अर्थ एवं परिभाषा 2. समाज का शिक्षा पर प्रभाव 3. भारतीय समाज की प्रकृति 4. शिक्षा और सामाजिक परिवर्तन	12 घण्टे
Unit-III	**Society and Education** 1. Meaning and definition of society 2. Impact of society on Education 3. Nature of Indian Society 4. Education and social changes	12 Hours
इकाई-IV	**लेकतंत्र एवं शिक्षा** 1. लेकतंत्र का अर्थ एवं परिभाषा 2. भारतीय लोकतंत्र का मूल सिद्धान्त	12 घण्टे

	3. लोकतंत्र एवं शिक्षा 4. लोकतांत्रिक सामाजिक व्यवस्था के लिए शिक्षा का उद्देश्य	
Unit-IV	**Democracy and Education** 1. Meaning and Definition of Democracy 2. Basic Principles of Indian Democracy 3. Democracy and Education 4. Objectives of Education for social Democracy system	12 Hours
इकाई-V	**भारतीय चिन्तकों का शिक्षा दर्शन** 1. स्वामी दयानन्द का शिक्षा दर्शन 2. स्वामी विवेकानन्द का शिक्षा दर्शन 3. श्री अरविन्द का शिक्षा दर्शन 4. महात्मा गाँधी का शिक्षा दर्शन	12 घण्टे
Unit-V	**Education Philosophy of Indian Thinkers** 1. Education Philosophy of Swami Dayanand 2. Education Philosophy of Swami Vivekananda 3. Education Philosophy of Sri Aurobindo 4. Education Philosophy of Mahatma Gandhi	12 Hours
Suggested Readings :	1. डॉ. योगेश कुमार सिंह, शिक्षा–दर्शन, यूनिवर्सिटी पब्लिकेशन्स, नई दिल्ली, 2007 2. डॉ. सुरेन्द्र कुमार शर्मा, शिक्षा–दर्शन, डिस्कवरी पब्लिशिंग हाउस, नई दिल्ली, 2006 3. डॉ. अशोक कुमार सिंह, भारतीय शिक्षा–दर्शन, दर्शना पब्लिकेशन, भागलपुर, बिहार, 2018 4. डॉ. एस.के.पाल, प्रो. एल.एन. गुप्त एवं प्रो. मदन मोहन, शिक्षा के दार्शनिक एवं समाजशास्त्री आधार, कैलाश प्रकाशन, इलाहाबाद, 2000 5. रमन बिहारी लाल, शिक्षा के दार्शनिक एवं समाजशास्त्रीय सिद्धान्त, रस्तोगी पब्लिकेशन्स, मेरठ, 2000	
परिलब्धि	शिक्षा दर्शन के चिन्तन से युक्त विद्यार्थी स्वयं के जीवन तथा समाज में उत्पन्न समस्याओं का यथोचित समाधान प्रस्तुत करने में सक्षम हो सकेंगे।	
Outcomes -	On the basis of this course the students will be able to handle different kinds of situations of life and their society.	

बी.ए. पाठ्यक्रम (दर्शनशास्त्र) / B.A. Programme (Philosophy)

सेमेस्टर–IV /Semester - IV

आधार पाठ्यक्रम / Skill Enhancement- (S.E.) -404

Credits- 04
Max. Marks - 60
Min. Marks -

नैतिक मूल्य एवं व्यक्तित्व विकास
Moral values and Personality Development

उद्देश्य	इस पाठ्यक्रम का उद्देश्य विद्यार्थियों को व्यक्तित्व विकास हेतु नैतिक मूल्यों की शिक्षा देना है।	
Objective -	The objective of this course is to teach the students the moral values for their personality development.	
इकाई	विषय	व्याख्यान की संख्या
इकाई-I	**मूल्य** 1. मूल्य का अर्थ 2. मूल्यों का वर्गीकरण 3. नैतिक मूल्य की अवधारणा 4. नैतिक मूल्यों का महत्व	12 घण्टे
Unit-I	**Values** 1. Meaning of values 2. Classification of values 3. Concept of Moral values 4. Importance of Moral values	12 Hours
इकाई-II	**चरित्र–निर्माण** 1. चरित्र का अर्थ और परिभाषा 2. उत्तम चरित्र – निर्माण का साधन 3. उत्तम चरित्र के लक्षण 4. चरित्र निर्माण में शिक्षा की भूमिका	12 घण्टे
Unit-II	**Character Building** 1. Meaning and definition of character 2. Means of Good character building 3. Traits of Good character 4. Role of Education in character Building	12 Hours
इकाई-III	**सद्गुण** 1. यम 2. नियम 3. कर्मयोग 4. वसुधैव कुटुम्बकम	12 घण्टे
Unit-III	**Virtues** 1. Yama 2. Niyama 3. Karmayoga 4. Vasudhaiva Kutumbakam	12 Hours

इकाई-IV	**आदतें** 1. अनुशासन 2. समय–प्रबंधन 3. नियमित दिनचर्या 4. सकारात्मक चिन्तन	12 घण्टे
Unit-IV	**Habits** 1. Discipline 2. Time Management 3. Regular routine 4. Positive thinking	12 Hours
इकाई-V	**व्यक्तित्व विकास** 1. व्यक्तित्व की अवधारणा 2. व्यक्तित्व विकास का अर्थ 3. व्यक्तित्व विकास एवं चरित्र 4. व्यक्तित्व विकास में नैतिक मूल्यों की भूमिका	12 घण्टे
Unit-V	**Personality Development** 1. Concept of Personality 2. Meaning of Personality Development 3. Personality Development and Character 4. Role of Moral values in Personality Development	12 Hours
Suggested Readings :	1. स्वामी विवेकानन्द, व्यक्तित्व का सम्पूर्ण विकास, प्रकाशक रामकृष्ण मठ, नागपुर, 2006 2. डॉ.एम.ए. बेग, व्यक्तित्व विकास एवं निखार, मध्य प्रदेश हिन्दी ग्रन्थ अकादमी, भोपाल, 1997 3. बैजनाथ सिंह, व्यक्तिगत और सामुदायिक विकास, ब्रिटिश बुक डिपो, हजरतगंज लखनऊ, 1961 4. अरुण सागर, शिष्टाचार एवं व्यक्तित्व विकास, आनन्द, वी एण्ड एस पब्लिशर्स, नई दिल्ली, 2017 5. डॉ. सुरेशचन्द्र शर्मा, व्यक्तित्व विकास और भगवद्गीता, मंजुल पब्लिशिंग हाउस, भोपाल, 2016 6. प्रो. समानी ऋजुप्रज्ञा, व्यक्तित्व विकास और योग, जैन विश्व भारती बुक स्टोर, राजस्थान, 2015 7. अजित नारायण त्रिपाठी, नैतिक और मानवीय मूल्य, प्रतिश्रुति प्रकाशन, कलकत्ता, 2017 8. Barun K. Mitra, Personality Development and soft skills, Oxford University Press, 2016	
परिलब्धि	इस पाठ्यक्रम के अध्ययन के उपरांत विद्यार्थी सद्गुणों से युक्त होकर समाज के बेहतरी के लिए कार्य कर सकेंगे।	
Outcomes	On the basis of this course the students will be able to work for betterment of their society.	

BACHELOR OF ARTS (B.A.) PHILOSOPHY

PROGRAMME STRUCTURE
(As per NEP 2020 & CBCS Ordinance 14 A)

1st Year

SEMESTER – I					
Course Code & Name	**Course Type**	**Theory Paper**	**Internal Assessment**	**Maximum Marks**	**Credits**
101 Indian Philosophy-I	Major Core	60	40	100	6
102 Ancient Indian History, Culture and Archaeology	Minor Core	60	40	100	6
103 Philosophy of Shri Ramcharitamanas*	GE	60	40	100	4
104 Hindi Bhasha	AE (FC)	60	40	100	4
SEMESTER TOTAL				**400**	**20**
CUMULATIVE TOTAL				**400**	**20**

SEMESTER – II					
Course Code & Name	**Course Type**	**Theory Paper**	**Internal Assessment**	**Maximum Marks**	**Credits**
201 Indian Philosophy-II	Major Core	60	40	100	6
202 Indian Culture	Minor Core	60	40	100	6
203 Philosophy of Gita*	GE	60	40	100	4
204 Environmental Studies	AE (FC)	60	40	100	4
SEMESTER TOTAL				**400**	**20**
CUMULATIVE TOTAL				**800**	**40**

GE: Generic Elective **AE: Ability Enhancement** **FC: Foundation Course**

*Students may choose this course as a **Generic Elective** or may choose a Generic Elective Course offered in other UTD's at the same level or may choose a Course offered by MOOC's through SWAYAM.

The student will be awarded Certificate in Philosophy on successful completion of first year.

Credit Distribution as per the Ordinance 14 A

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		Main Faculty (as per prerequisite)			Any Faculty	Skill Enhancement Course (SEC)	Ability Enhancement Course (AEC)	Field Projects/ internship/ apprenticeship /community engagement & service	Credits	Qualification Title (Credits Requirements)
		Subject I		Subject II	Subject III					
Level	Sem	Major		Minor	Generic Elective Course	Vocational Course		#Inter/Intra Faculty		
		Core	DSE							
Level 5	1	6		6	4	-	4	-	6+6+4+4 =20	(40) Undergraduate Certificate in Main Faculty
	2	6		6	4	-	4	-	6+6+4+4 =20	
Level 6	3	6		6	4	4	-	-	6+6+4+4 =20	(80) Undergraduate Diploma in Main Faculty
	4	6		6	4	4	-	-	6+6+4+4 =20	
Level 7	5	6	4	-	-	4	-	6	6+4+4+6 =20	(120) Bachelor Degree in Main Faculty
	6	6	4+4	-	-	-	-	6	6+4+4+6 =20	
Level 8	7	6	4	4 Research Methodology	-	-	-	6	4+4+4+6 =20	(160) Bachelor Degree (Honours/Research) in Main Faculty
	8	6	-	4	-	-	-	10	6+4+10 = 20	
Total		48	16	32	16	12	8	28	160 Credits	

बी.ए. पाठ्यक्रम (दर्शनशास्त्र) / B.A. Programme (Philosophy)

सेमेस्टर–I/ Semester - I

मुख्य विषय / Major Core -101

भारतीय दर्शन–I

Indian Philosophy-I

Credits- 06
Max. Marks - 60
Min. Marks -

उद्देश्य	इस पाठ्यक्रम का उद्देश्य विद्यार्थियों को दर्शन का स्वरूप, वैदिक एवं अवैदिक दर्शनों यथा, उपनिषद्, चार्वाक, जैन और बौद्ध दर्शनों के तत्त्वमीमांसीय एवं ज्ञानमीमांसीय अवधारणाओं के साथ–साथ उनके आधारभूत सिद्धान्तों से परिचित कराना है।	
Objective	The objective of this course is to teach and train the students the nature of philosophy, the metaphysical and epistemological concepts of Indian Philosophy, and the concepts that belong to the Classical and Heterodox systems of Indian Philosophy, delving deep into the basics and fundamentals of Upanishads, Charvaka, Jaina and Buddhist Philosophy.	
इकाई	**विषय**	**व्याख्यान की संख्या**
इकाई-I	**दर्शन** 1. दर्शन का स्वरूप 2. दर्शन एवं फिलॉसफी में भेद 3. भारतीय दर्शन का वर्गीकरण 4. भारतीय दर्शन की विशेषताएँ	18 घण्टे
Unit-I	**Philosophy** 1. Nature of Philosophy 2. Distinction between Darśana and Philosophy 3. Classification of Indian Philosophy 4. Characteristics of Indian Philosophy	18 Hours
इकाई-II	**उपनिषद् एवं गीता** 1. उपनिषद् में ब्रह्म और आत्मा का स्वरूप 2. भगवद्गीता में ज्ञानयोग 3. भगवद्गीता में कर्मयोग 4. भगवद्गीता में भक्तियोग	18 घण्टे
Unit-II	**Upanishads & Gita** 1. Nature of Brahman and Ātman in Upanishads 2. Jñānayoga in Bhagavadgītā 3. Karmayoga in Bhagavadgītā 4. Bhaktiyoga in Bhagavadgītā	18 Hours
इकाई-III	**लोकायत** 1. परिचय 2. तत्त्वमीमांसा 3. ज्ञानमीमांसा 4. नीतिमीमांसा	18 घण्टे
Unit-III	**Lokāyata** 1. Introduction 2. Metaphysics 3. Epistemology 4. Ethics	18 Hours

इकाई-IV	**जैन दर्शन** 1. परिचय 2. अनेकान्तवाद 3. स्याद्वाद 4. कैवल्य	18 घण्टे
Unit-IV	**Jainism** 1. Introduction 2. Anekāntavāda 3. Syādavāda 4. Kaivalya	18 Hours
इकाई-V	**बौद्ध दर्शन** 1. परिचय 2. चार आर्य सत्य 3. अनात्मवाद 4. क्षणिकवाद	18 घण्टे
Unit-V	**Buddhism** 1. Introduction 2. Four Noble Truths 3. Anātmavāda (No-soul theory) 4. Theory of Momentariness	18 Hours
Suggested Readings :	1. डॉ. चन्द्रधर शर्मा, भारतीय दर्शन अलोचन और अनुशीलन, मोतीलाल बनारसीदास, दिल्ली 1995 2. डॉ. बी.एन. सिंह एवं डॉ. आशा सिंह, भारतीय दर्शन, स्टूडेण्ट्स फ्रेण्ड्स एण्ड कम्पनी, काशी हिन्दू विश्वविद्यालय मार्ग लंका, वाराणसी–5, 1996 3. प्रो. हरेन्द्र प्रसाद सिन्हा, भारतीय दर्शन की रूपरेखा, मोतीलाल बनारसीदास, दिल्ली, 1963 4. बलदेव उपाध्याय, भारतीय दर्शन, शारदा मन्दिर प्रकाशन, वाराणसी, 1997 5. नन्द किशोर देवराज, भारतीय दर्शन, उत्तर प्रदेश हिन्दी संस्थान, लखनऊ, 1976 6. Dutta & Chatterjee, An Introduction to Indian Philosophy, University of Calcutta, 1968. 7. M. Hiriyanna, Outlines of Indian Philosophy, George Allen and Unwin, Lodon-1932.	
परिलब्धि	विद्यार्थी पाठ्यक्रम के अध्ययनोपरान्त भारतीय दार्शनिक सम्प्रदायों के प्रति विश्लेषणात्मक एवं तुलनात्मक दृष्टि से परिपूर्ण होंगे। विद्यार्थी हमारे प्राचीन ऋषियों के ज्ञान और संस्कृति से परिचित होंगे तथा उनके चिन्तन का क्षेत्र विस्तृत होगा।	
Outcomes	This Course will help the students to evaluate each system of Indian Philosophy in critical and comparative light. Through this course, students will come to know philosophical and rich cultural wisdom of our ancient thinkers.	

बी.ए. पाठ्यक्रम (दर्शनशास्त्र) /B.A. Programme (Philosophy)

सेमेस्टर–Semester - I

गौण विषय / Miner Core -102

प्राचीन भारतीय इतिहास, संस्कृति एवं पुरातत्त्व

Ancient Indian History, Culture and Archaeology

Credits- 06
Max. Marks - 60
Min. Marks -

उद्देश्य	इस पाठ्यक्रम का उद्देश्य विद्यार्थियों को प्राचीन भारतीय इतिहास, संस्कृति एवं पुरातत्त्व की अवधारणा से परिचित कराते हुये उसके स्रोत, वर्गीकरण एवं कला से परिचित कराना है।	
Objective	The objective of this course is to teach the students the fundamental concepts of the Ancient Indian History, Culture and Archaeology. It will deal with the sources and classifications of these concepts and touch upon their artful aspects.	
इकाई	**विषय**	**व्याख्यान की संख्या**
इकाई-I	**प्राचीन भारतीय इतिहास, संस्कृति एवं पुरातत्त्व** 1. प्राचीन भारतीय इतिहास–स्वरूप 2. संस्कृति–स्वरूप 3. पुरातत्त्व–स्वरूप	18 घण्टे
Unit-I	**Ancient Indian History, Culture and Archaeology** 1. Nature of Ancient Indian History 2. Nature of Culture 3. Nature of Archaeology	18 Hours
इकाई-II	**प्राचीन भारतीय इतिहास के स्रोत** 1. पुरातात्त्विक 2. साहित्यिक 3. विदेशी यात्रियों के विवरण (मेगस्थनीज, फाह्यान, ह्वेनसांग, इत्सिंग, अलबरुनी)	18 घण्टे
Unit-II	**Sources of Ancient Indian History** 1. Archaeological 2. Literary 3. Description of foreign travelers (Megasthenes, Fahien, Huansang, Itsing, Alberuni)	18 Hours
इकाई-III	**प्राचीन इतिहास का वर्गीकरण** 1. प्रागैतिहासिक काल 2. आद्यैतिहासिक काल 3. ऐतिहासिक काल	18 घण्टे
Unit-III	**Classification of Ancient Indian History** 1. Pre Historic 2. Proto Historic 3. Historical	18 Hours
इकाई-IV	**प्राचीन भारतीय कला** 1. स्थापत्य कला (सैन्धव नगर योजना, स्तूप, मन्दिर–नागर शैली) 2. मूर्तिकला (दशावतार, शिव की सौम्य मूर्तियाँ) 3. चित्रकला (अजन्ता एवं एलोरा)	18 घण्टे
Unit-IV	**Ancient Indian Art** 1. Architecture (Indus town planning, Stoop, Temple-Nagara Art) 2. Sculpture (Dashavatar, Soumya Murties of Lord Shiva)	18 Hours

	3. Painting (Ajanta and Alora)	
इकाई-V	**प्राचीन भारत में शिक्षा** 1. शिक्षा के प्रमुख उद्देश्य 2. शिक्षा पद्धति 3. प्रसिद्ध विश्वविद्यालय (तक्षशिला, नालंदा, वलभी एवं विक्रमशिला)	18 घण्टे
Unit-V	**Education in Ancient India** 1. Main objectives of Education 2. Education System 3. Famous Universities (Takshashila, Nalanda, Valabhi and Vikramshila)	18 Hours
Suggested Readings :	1. जयनारायण पाण्डेय, पुरातत्त्व विमर्श, प्राच्य विद्या संस्थान, प्रयागराज, 2020 2. बी.के. जैन, भारत का प्रागैतिहास और आद्य–इतिहास, प्रिन्ट वर्ल्ड, प्राइवेट लि., 2008 3. विमलचन्द्र पाण्डेय, प्राचीन भारत का इतिहास, सेन्ट्रल पब्लिशिंग हाउस, इलाहाबाद, 2016 4. जयशंकर मिश्र, प्राचीन भारत का सामाजिक इतिहास, बिहार हिन्दी ग्रन्थ अकादमी, 1974 5. के.सी. श्रीवास्तव, प्राचीन भारतीय इतिहास एवं संस्कृति, यूनाइटेड बुक डिपो, 2000 6. प्रो. महेश चन्द्र श्रीवास्तव, प्राचीन भारत का इतिहास (पूर्व–ऐतिहासिक काल से 320 ई. तक) शिवांक प्रकाशन, नई दिल्ली, 2020 7. Prof. Mahesh Chandra Shrivastava - Ancient History of Indian, Manisha Publication, Delhi, 2018	
परिलब्धि	विद्यार्थी पाठ्यक्रम के अध्ययनोपरान्त प्राचीन भारतीय इतिहास, संस्कृति एवं पुरातत्त्व की अवधारणाओं से परिचित होकर सम्बन्धित विषय में उच्च शिक्षा प्राप्त करने योग्य हो सकेंगे।	
Outcomes	It is necessary for students to be acquainted with their culture. This Course will encourage the students for Higher education in Ancient Indian History, Culture & Archaeology.	

बी.ए. पाठ्यक्रम (दर्शनशास्त्र) / B.A. Programme (Philosophy)

सेमेस्टर – I / Semester - I

वैकल्पिक विषय / Generic Elective (G.E.) - 103

श्री रामचरितमानस–दर्शन

Philosophy of Shri Ramcharitamanas

Credits- 04
Max. Marks - 60
Min. Marks -

उद्देश्य	विद्यार्थियों को श्रीरामचरितमानस में वर्णित नैतिक व आध्यात्मिक मूल्यों से परिचित कराकर उनके अनुरूप जीवन शैली विकसित करना पाठ्यक्रम का प्रमुख उद्देश्य है।	
Objective	This course aims at inculcating in the students the values and ethos mentioned in the Shri Ramcharitmanas.	
इकाई	**विषय**	**व्याख्यान की संख्या**
इकाई-I	**परिचय** 1. श्रीरामचरितमानस 2. गोस्वामी तुलसीदास 3. रामायण	12 घण्टे
Unit-I	**Introduction** 1. Shri Ramcharitamanas 2. Goswami Tulsidas 3. Ramayana	12 Hours
इकाई-II	**गीता** 1. लक्ष्मण–गीता (अयोध्या काण्ड 91–93.2) 2. राम–गीता (अरण्य काण्ड 13.5–16) 3. विभीषण–गीता (लंका काण्ड 79–80)	12 घण्टे
Unit-II	**Gita** 1. Laxaman-Gita (Ayodhya Kanda 91-93.2) 2. Ram-Gita (Aranya Kanda 13.5-16) 3. Vibhishana-Gita (Lanka Kanda 79-80)	12 Hours
इकाई-III	**मानस की सामाजिकता** 1. सामाजिक समरसता 2. अस्पृश्यता की निःसारता 3. परोपकार का महत्व	12 घण्टे
Unit-III	Sociality of Manas 1. Social Harmony 2. Vanity of Untouchability 3. Importance of charity	12 Hours
इकाई-IV	**मानस में पर्यावरण** 1. पेड़–पौधों का सम्मान 2. पशु–पक्षी का सम्मान 3. नदी–पर्वत का सम्मान	12 घण्टे
Unit-IV	**Environment in Manas** 1. Respect of Trees and Plants 2. Respect of Animals and birds 3. Respect of Rivers and Mountains	12 Hours

इकाई-V	श्रीराम / भरत / महावीर हनुमान 1. मानव जीवन के आदर्श–मर्यादा पुरुषोत्तम श्रीराम 2. भरत चरित की विशेषताएँ 3. भक्ति की पराकाष्ठा – महावीर हनुमान	12 घण्टे
Unit-V	Shri Ram/Bharat/Mahavir Hanuman 1. Ideal of Human Life- Maryada Purushottam ShriRam 2. Characteristics of Bharat's Life 3. Extreme of Devotion- Mahavir Hanuman	12 Hours
Suggested Readings :	1. डॉ. श्रीकान्त मिश्र, भारतीय नीतिशास्त्र, आशा पब्लिशिंग कम्पनी, आगरा, 2018 2. श्री रामचरितमानस सरल टीका, गीताप्रेस गोरखपुर, 2012 3. डॉ. नारेन्द्र कुमार मेहता, श्रीमद् बाल्मीकीय रामायण, प्रश्नोत्तरी मंजुषा, श्री रीना पब्लिकेशन, 2018 4. श्री भागवत पुराण, गीताप्रेस, गोरखपुर, 2000 5. हनुमान प्रसाद पोद्दार, कल्याण कुंज, गीताप्रेस, गोरखपुर, 1990 6. स्वामी रामसुखदास, जीवन का सत्य, गीताप्रेस, गोरखपुर, 1994 7. डॉ. पूजा व्यास, मानवीय सद्गुणों का विकास, मानस एवं गीता के विशेष सन्दर्भ में, सत्यम् प्रकाशन, दिल्ली, 2018 8. हनुमान प्रसाद पोद्दार, श्री राम चरित मानस, कोड 82, टीकाकार, गीताप्रेस गोरखपुर, 2018 9. डॉ. उदय प्रताप सिंह, तीर्थराज प्रयाग और रामभक्ति का अमृत कलश–प्रयाग कुम्भ, 2013 10. वैष्णव मताब्ज भास्कर, आचार्य जयकान्त शर्मा, जगद्गुरु रामानन्दाचार्य स्मारक सेवा न्यास, श्रीमठ काशी 11. प्रो. एस.पी. गौतम, श्री रामचरित मानस में अध्यात्म एवं विज्ञान, मध्यप्रदेश हिन्दी ग्रन्थ अकादमी, भोपाल (म.प्र.) 12. Goswami Tulsidas, Shri Ramcharitmanas, Gita Press, Gorakhpur, 2019 13. Tulsidas Goswami, Tulsi Ramanayana the Hindu Bible, Only Rama Only, 2017	
परिलब्धि	इस पाठ्यक्रम के माध्यम से विद्यार्थी के जीवन में नैतिक व आध्यात्मिक मूल्यों का समावेश होगा, जिससे विद्यार्थी सामाजिक समरसता स्थापित करने में सहायक हो सकेंगे।	
Outcomes	On the basis of this course the students will get acquainted with the moral and spiritual values, on account of this the students will become successful in leading a social and harmonious life.	

बी.ए. पाठ्यक्रम (दर्शनशास्त्र) /B.A. Programme (Philosophy)

सेमेस्टर – I/ Semester - I

vk/kkj ikB~;Øe@Ability Enhancement - (A.E.) -104

fgUnh Hkk"kk

Hindi Language

Credits- 04
Max. Marks - 60
Min. Marks -

उद्दे□य	प्रस्तुत प्र न–पत्र का उद्देश्य विद्यार्थियों में हिन्दी व्याकरण तथा भाषा का ज्ञान कराते हुए प्रतियोगी परीक्षाओं हेतु तैयार करना है।	
इकाई	**विषय**	**व्याख्यान की संख्या**
इकाई-I	**भाषा एवं व्याकरण** 1. भाषा का स्वरूप 2. व्याकरण का अर्थ 3. वर्ण एवं शब्द 4. सार्थक शब्दों के भेद	12 घण्टे
इकाई-II	**व्याकरणिक कोटियाँ** 1. संज्ञा 2. लिंग 3. वचन 4. कारक	12 घण्टे
इकाई-III	**व्याकरणिक कोटियाँ** 1. सर्वनाम 2. विशेषण 3. क्रिया 4. काल एवं वाच्य	12 घण्टे
इकाई-IV	**व्याकरणिक कोटियाँ** 1. संधि 2. समास 3. उपसर्ग 4. प्रत्यय	12 घण्टे
इकाई-V	**लेखन** 1. पत्र लेखन 2. पल्लवन 3. संक्षेपण 4. लोकोक्ति–मुहावरे	12 घण्टे
संदर्भ पुस्तक	1. हिन्दी व्याकरण एवं रचना, मध्यप्रदेश हिन्दी ग्रन्थ अकदमी, भोपाल, 2013 2. डॉ. शिवमूर्ति शर्मा, सामान्य हिन्दी, शारदा पुस्तक भवन, इलाहाबाद, संस्करण 2005 3. भाषा विज्ञान हिन्दी भाषा और लिपि, रामकिशोर शर्मा, लोकभारती प्रकाशन, इलाहाबाद, 2007 4. डॉ. प्रभा व्यौहार, डॉ. मधु जैन, डॉ. रघुवीर प्रसाद गोस्वामी, डॉ. नाथूराम राठौर, हिन्दी व्याकरण एवं रचना, मध्यप्रदेश हिन्दी ग्रन्थ अकादमी, भोपाल, 2013	
परिलब्धि	राष्ट्र भाषा हिन्दी का ज्ञान विद्यार्थियों में सांस्कृतिक चेतना और राष्ट्रीय भावना का विकास करेगा।	

बी.ए. पाठ्यक्रम (दर्शनशास्त्र) / B.A. Programme (Philosophy)

सेमेस्टर–II/Semester - II
मुख्य विषय / Major Core -201
भारतीय दर्शन–II
Indian Philosophy-II

Credits- 06
Max. Marks - 60
Min. Marks -

उद्देश्य	भारतीय दर्शन के आस्तिक सम्प्रदाय की अवधारणाओं एवं सिद्धान्तों के सम्बन्ध में विद्यार्थियों को शिक्षित करना पाठ्यक्रम का मुख्य उद्देश्य है।	
Objective	The objective of this course is to teach the students the concepts and ideas of Orthodox systems of Indian Philosophy.	
इकाई	**विषय**	**व्याख्यान की संख्या**
इकाई-I	**सांख्य दर्शन** 1. सत्कार्यवाद 2. पुरुष 3. प्रकृति 4. विकासवाद के सिद्धान्त 5. कैवल्य	18 घण्टे
Unit-I	**Sāṅkhya Philosophy** 1. Satkāryavāda 2. Puruṣa 3. Prakriti 4. Theory of Evolution 5. Kaivalya.	18 Hours
इकाई-II	**न्याय दर्शन** 1. प्रत्यक्ष 2. अनुमान 3. शब्द 4. उपमान 5. ईश्वर की सत्ता सिद्धि हेतु तर्क	18 घण्टे
Unit-II	**Nyāya Philosophy** 1. Pratyaksha 2. Anuman 3. Shabda 4. Upamana 5. Proofs for the Existence of God	18 Hours
इकाई-III	**वैशेषिक एवं मीमांसा दर्शन** 1. पदार्थ (वैशेषिक) 2. परमाणुवाद (वैशेषिक) 3. धर्म (मीमांसा) 4. अपूर्व (मीमांसा) 5. स्वतः प्रामाण्यवाद (मीमांसा)	18 घण्टे
Unit-III	**Vaiśeshika and Mīmāmsā Philosophy**	18 Hours

	1. Padārthas (Vaiheshika) 2. Atomism (Vaiheshika) 3. Dharma (Mimamsa) 4. Apūrva (Mimamsa) 5. Swatah Pramanyavada (Mimamsa)	
इकाई-IV	**अद्वैतवेदान्त** 1. ब्रह्म 2. माया 3. जीव 4. ईश्वर 5. मुक्ति	18 घण्टे
Unit-IV	**Advaita Vedānta** 1. Brahman 2. Māyā 3. Jiva 4. Ishwar 5. Mukti	18 Hours
इकाई-V	**विशिष्टाद्वैत** 1. ब्रह्म 2. चित् 3. अचित् 4. मुक्ति 5. सत्ख्यातिवाद्	18 घण्टे
Unit-V	**Viśiṣṭādvaita** 1. Brahman 2. Chit 3. Achit 4. Mukti 5. Satkhyativada	18 Hours
Suggested Readings :	1. डॉ. चन्द्रधर शर्मा, भारतीय दर्शन अलोचन और अनुशीलन, मोतीलाल बनारसीदास, दिल्ली 1995 2. डॉ. बी.एन. सिंह एवं डॉ. आशा सिंह, भारतीय दर्शन, स्टूडेण्ट्स फ्रेण्ड्स एण्ड कम्पनी, काशी हिन्दू विश्वविद्यालय मार्ग लंका, वाराणसी–5, 1996 3. प्रो. हरेन्द्र प्रसाद सिन्हा, भारतीय दर्शन की रूपरेखा, मोतीलाल बनारसीदास, दिल्ली, 1963 4. बलदेव उपाध्याय, भारतीय दर्शन, शारदा मन्दिर वाराणसी, 1997 5. नन्द किशोर देवराज, भारतीय दर्शन, उत्तर प्रदेश हिन्दी संस्थान, लखनऊ, 1976 6. Dutta & Chatterjee, An Introduction to Indian Philosophy, University of Calcutta, 1968 7. M. Hiriyanna, Outlines of Indian Philosophy, George Allen and Unwin, Lodon-1932	
परिलब्धि	विद्यार्थी अस्तिक दर्शनों के सिद्धान्तों से परिचित होकर जीवन जीने की अनेक विधियों व शैलियों से परिचित होंगे, जिससे उनके व्यक्तित्व का समग्र विकास हो सकेगा।	
Outcomes	Through this course the students will be introduced to the differents concepts and styles of Orthodox systems. They will be able to have personality development.	

बी.ए. पाठ्यक्रम (दर्शनशास्त्र) / B.A. Programme (Philosophy)

सेमेस्टर–II /Semester - II
गौण विषय / Miner Core -202
भारतीय संस्कृति
Indian Culture

Credits- 06
Max. Marks - 60
Min. Marks -

उद्देश्य	विद्यार्थियों को भारतीय संस्कृति के विषय में शिक्षित करना इस पाठ्यक्रम का प्रमुख उद्देश्य है। वर्णव्यवस्था, संस्कार आदि अवधारणाएँ भारतीय संस्कृति के स्तम्भ हैं। इस पाठ्यक्रम के माध्यम से विद्यार्थी इन सांस्कृतिक अवधारणाओं को समझेंगे।	
Objective	Varnavyavastha, Purushartha, Sanskar etc. are consider to be the pillars of Indian Culture. The objective of this course is to teach the students the values and ethos of Indian culture.	
इकाई	**विषय**	**व्याख्यान की संख्या**
इकाई-I	**संस्कृति** 1. संस्कृति की अवधारणा 2. भारतीय संस्कृति की विशेषताएँ 3. वसुधैव कुटुम्बकम् की अवधारणा 4. धर्म का अर्थ	18 घण्टे
Unit-I	**Culture** 1. Concept of culture 2. Characteristics of Indian Culture 3. Concept of Vasudhaiva Kutumbakam 4. Meaning of Dharma	18 Hours
इकाई-II	**वर्णव्यवस्था** 1. ब्राह्मण 2. क्षत्रिय 3. वैश्य 4. शूद्र	18 घण्टे
Unit-II	**Varnavyavastha** 1. Brahman 2. Kshatriya 3. Vaishya 4. Shudra	18 Hours
इकाई-III	**आश्रम व्यवस्था** 1. ब्रह्मचर्य 2. गृहस्थ 3. वानप्रस्थ 4. संन्यास	18 घण्टे
Unit-III	**Ashramvyavastha** 1. Brahmacharya 2. Grihastha 3. Vanaprastha 4. Sannyas	18 Hours

इकाई-IV	**पुरुषार्थ व्यवस्था** 1. धर्म 2. अर्थ 3. काम 4. मोक्ष	18 घण्टे
Unit-IV	**Purushartha Vyavastha** 1. Dharma 2. Artha 3. Kama 4. Moksha	18 Hours
इकाई-V	**विवाह** 1. अर्थ 2. उद्देश्य 3. प्रकार 4. सामाजिक महत्व	18 घण्टे
Unit-V	**Marriage** 1. Meaning 2. Objectives 3. Kinds 4. Social Importance	18 Hours
Suggested Readings :	1. डॉ. श्रीकान्त मिश्र, भारतीय नीतिशास्त्र, आशा पब्लिशिंग कम्पनी, आगरा, 2018 2. जयशंकर मिश्र, प्राचीन भारत का सामाजिक इतिहास, बिहार हिन्दी ग्रन्थ अकादमी, 1974 3. के.सी. श्रीवास्तव, प्राचीन भारतीय इतिहास एवं संस्कृति, यूनाइटेड बुक डिपो, 2000 4. विमला देवी राय, वेद कालीन समाज एवं संस्कृति, कला प्रकाशन, वाराणसी, 2001 5. बी.एन. लूनिया, भारतीय सभ्यता तथा संस्कृति का विकास, लक्ष्मीनारायण अग्रवाल, आगरा, 2001 6. डॉ. हृदय नारायण मिश्र, समाज दर्शन सैद्धान्तिक एवं समस्यात्मक विवेचन, शेखर प्रकाशन, इलाहाबाद, 2003	
परिलब्धि	इस पाठ्यक्रम के माध्यम से विद्यार्थी प्राचीन भारतीय संस्कृति, समाज, परिवार आदि के सम्बन्ध में गहन एवं विस्तृत ज्ञान से युक्त होंगे।	
Outcomes	This course will help the students to have wide and deep knowledge of ancient Indian society, Indian family, Indian marriage systems and so on and so forth.	

बी.ए. पाठ्यक्रम (दर्शनशास्त्र) / B.A. Programme (Philosophy)

सेमेस्टर–II / Semester - II
वैकल्पिक विषय/ Generic Elective (G.E.) - 203
गीता दर्शन
Philosophy of Gita

Credits- 04
Max. Marks - 60
Min. Marks -

उद्देश्य	प्रस्तुत पाठ्यक्रम का उद्देश्य विद्यार्थियों को श्रीमद्भगवद्गीता के प्रमुख लोकोपकारक सिद्धान्तों से परिचित कराना है, जिससे विद्यार्थी अपने तथा समाज के अन्य लोगों के जीवन में उत्पन्न द्वन्द्वों के समाधान में सहायक हो सकें।	
Objective -	This course aims at getting students acquainted with beneficent principles of the Shrimad Bhagvadgita, so that the students may be able to solve the problems of their life and their society.	
इकाई	**विषय**	**व्याख्यान की संख्या**
इकाई-I	**परिचय** 1. श्रीमद्भगवद्गीता 2. योगेश्वर श्रीकृष्ण 3. अर्जुन	12 घण्टे
Unit-I	**Introduction** 1. Shrimadbhagvadgita 2. Yogeshwar Shrikrishna 3. Arjun	12 Hours
इकाई-II	**अर्जुन विषाद् एवं मानव का द्वंद्व** 1. अर्जुन विषाद् का कारण 2. मानव जीवन के द्वंद्व 3. मानव के लिए गीता की सार्थकता	12 घण्टे
Unit-II	Arjun's Sorrow and Dialectic of Human 1. Cause of Arjun's Sorrow 2. Dialectic of Human's Life 3. Relevance of Gita for Human	12 Hours
इकाई-III	**योग** 1. कर्मयोग 2. ज्ञानयोग 3. भक्तियोग	12 घण्टे
Unit-III	**Yoga** 1. Karmayoga 2. Jnanayoga 3. Bhaktiyoga	12 Hours
इकाई-IV	**स्थितप्रज्ञ** 1. लक्षण 2. व्यवहार 3. मानव का उच्चत्तम आदर्श	12 घण्टे
Unit-IV	**Sthitaprajna**	12 Hours

	1. Symbol 2. Behaviour 3. Highest Ideal of Human	
इकाई-V	**गुण** 1. सत्त्वगुण का प्रभाव 2. रजोगुण का प्रभाव 3. तमोगुण का प्रभाव	12 घण्टे
Unit-V	**Guna** 1. Impact of Sattvaguna 2. Impact of Rajoguna 3. Impact of Tamoguna	12 Hours
Suggested Readings :	1. श्रीमद्भवगद्गीता, गीताप्रेस गोरखपुर, सं. 2073 2. गीता रहस्य, कर्मयोगशास्त्र, अर्चना पब्लिकेशन, दिल्ली, 2006 3. भक्तिवेदान्त प्रभुपाद, भगवद्गीता : यथारूप, भक्ति वेदान्त बुक ट्रस्ट 4. डॉ. सागरमल जैन, जैन, बौद्ध एवं गीता का साधना मार्ग, राजस्थान, प्रा.भा.स. जयपुर, 1998 5. डॉ. सागरमल जैन, जैन, बौद्ध एवं गीता के आचार दर्शनों का तुलनात्मक अध्ययन, राजस्थान, प्रा.भा.स. जयपुर, 1998 6. डॉ. सत्यप्रकाश अग्रवाल, मानस एवं गीता .....लोकमंगल गुजिता, मोतीलाल बनारसीदास, दिल्ली, 1998 7. अरुण, अनासक्त योगी श्रीकृष्ण, विश्वभारती पब्लिकेशन्स, नई दिल्ली 2006 8. R.R. Verma, The Bhagwat Gita,	
परिलब्धि	श्रीमद्भगवद्गीता के उपदेशों से युक्त विद्यार्थी स्वयं के जीवन तथा समाज में उत्पन्न समस्याओं का यथोचित समाधान प्रस्तुत करने में सक्षम हो सकेंगे।	
Outcomes -	On the basis of this course the students will be able to handle different kinds of situations of life and their society.	

बी.ए. पाठ्यक्रम (दर्शनशास्त्र) / B.A. Programme (Philosophy)

सेमेस्टर–II /Semester - II

आधार पाठ्यक्रम / Ability Enhancement- (A.E.) -204

पर्यावरण अध्ययन

(Environmental Studies)

Credits- 04
Max. Marks - 60
Min. Marks -

उद्देश्य	प्रस्तुत पाठ्यक्रम का उद्देश्य विद्यार्थियों को पर्यावरण की अवधारणा, स्वरूप, क्षेत्र के साथ–साथ पर्यावरण से सम्बन्धित विषयों से परिचित कराना है।	
Objective -	This course aims at getting the students acquainted with the concept of environment, its nature, scope and different kinds of issues related environment.	
इकाई	**विषय**	**व्याख्यान की संख्या**
इकाई-I	**पर्यावरण** 1. स्वरूप 2. क्षेत्र 3. महत्व 4. भारतीय संस्कृति में पर्यावरणीय चिन्तन	12 घण्टे
Unit-I	**Environment** 1. Nature 2. Scope 3. Importance 4. Environmental thoughts in Indian Culture	12 Hours
इकाई-II	**पर्यावरण के घटक** 1. वायुमण्डल 2. जलमण्डल 3. स्थलमण्डल 4. जैव मण्डल	12 घण्टे
Unit-II	**Components of Environment** 1. Atmosphere 2. Hydrosphere 3. Lithosphere 4. Biosphere	12 Hours
इकाई-III	**पारिस्थितिक तन्त्र एवं जैवविविधता** 1. पारिस्थितिक तंत्र –संरचना, कार्य एवं प्रकार 2. पारिस्थितिक तंत्र–संरक्षण एवं पुर्नस्थापन 3. जैवविविधता एवं उसका संरक्षण 4. मुख्य बायोम	12 घण्टे

Unit-III	**Eco-System and Biodiversity** 1. Eco-System- Structure, Functions and Types 2. Eco-System- Preservation and Restoration 3. Biodiversity and It's Conservation 4. Major Biomes	12 Hours
इकाई-IV	**प्राकृतिक संसाधन एवं सम्बन्धित समस्याएँ** 1. भू–संसाधन 2. जल–संसाधन 3. ऊर्जा–संसाधन 4. समस्या एवं निवारण	12 घण्टे
Unit-IV	**Natural Resources and Associated Problems** 1. Land 2. Water 3. Energy 4. Problems and Solution	12 Hours
इकाई-V	**पर्यावरण प्रदूषण एवं प्रबन्धन** 1. प्रदूषण के प्रकार 2. नियंत्रण के उपाय 3. प्रबन्ध एवं उससे जुड़ी समस्याएँ 4. पर्यावरण सुरक्षा हेतु जनजागरूकता	12 घण्टे
Unit-V	**Environmental Pollution and Management** 1. Types of Pollution 2. Ways to Control 3. Management and Associated Problems 4. Public Awareness for Environmental safety	12 Hours
Suggested Readings :	1. डॉ. वीरेन्द्र सिंह यादव, भारतीय संस्कृति में पर्यावरण चिन्तन के विविध आयाम, ओमेगा पब्लिकेशन्स, नई दिल्ली, 2010 2- डॉ. दया शंकर त्रिपाठी, पर्यावरण अध्ययन, मोतीलाल बनारसीदास, दिल्ली, 2005 3- डी.एस. त्रिपाठी, पर्यावरण चेतना (सम्पादित), 1997 4- P.D. Sharma- Elements of Ecology, 1988	
परिलब्धि	इस पाठ्यक्रम के अध्ययन के उपरांत विद्यार्थी पर्यावरण से सम्बन्धित विभिन्न समस्याओं के समाधान में सहायक हो सकेंगे।	
Outcomes	This course will enable students to tackle different kinds of environment issues.	

Bachelor of Business Administration (BBA)
Full-Time Eight Semester Programme

Choice Based Credit System (CBCS)

PROGRAMME OBJECTIVES & STRUCTURE

The BBA Programme structure is divided into eight semesters that spreads over four years. The Courses are classified as major core courses, minor core courses, discipline centric electives, generic electives, ability enhancement and skill enhancement. The semesters include **Major Core Courses** on Management Process and Organisation Behaviour, Financial Management, Marketing Management, Human Resource Management, Production Management, Management Information System, Strategic Management and International Business to develop multi-disciplinary foundation and whet the critical thinking, analytical ability and problem solving skills of the participants. This will develop integrative foundation by imparting an understanding of managerial skills in all functional areas, mathematics & statistics applicable in business, human behaviour at work and various aspects of global environment. **Minor Core Courses** on Basics of Economics, Quantitative techniques, Financial Accounting & Tally, Business Laws, Research Methodology and Operation Research have been incorporated to build a holistic approach and strong foundation of the participants by demonstrating knowledge of facts, research related skills and principles in the field of managing operations legally in the business. **Discipline Centric Elective Courses (DCE)** on Finance, HR and Marketing as elective areas of specialisation to ensure better employability by updating their multi-professional skills has also been included. Besides, the programme also embraces courses for **Skill Enhancement (SE)** of the participants like Computers for Management, Communication Skills and Personality Development & Character Building to ameliorate the professional skills of the participants and prepare them to fit suitably into their field of work. The **Ability Enhancement (AE)** courses like English Language and Environmental Studies have been incorporated with the intention to develop the language proficiency through interactions embedded in meaningful contexts and to impart knowledge on natural processes to sustain life has been included. **Generic Elective Courses (GEC)** on Business Environment, Start-ups & Entrepreneurship, Indian Ethos for Effective Management and Digital Marketing to adequately equip them with market and business related skills imperative for creating and sustaining viable business in the fast changing business environment. Case studies, class presentations, assignments & Co-curricular activities are intrinsic part of the programme to give practical exposure to the participants regarding local, regional, national & global developments in the field of business management. The programme structure also includes dissertation and comprehensive viva voice to gauge student's skills to execute the learned concepts into practice and examine their comprehension and conception ability. This curriculum of BBA aims to provide enriched educational experience to the participants by upgrading their stock of knowledge, skills and attitude and equipping them for a bright professional life in a complex and rapid changing business landscape.

BACHELOR OF BUSINESS ADMINISTRATION (BBA)

PROGRAMME STRUCTURE
(As per NEP 2020 & CBCS Ordinance 14 A)

1st Year

SEMESTER – I					
Course Code & Name	**Course Type**	**Theory Paper**	**Internal Assessment**	**Maximum Marks**	**Credits**
101 Management Process & Organisation Behaviour	Major Core	60	40	100	6
102 Basics of Economics	Minor Core	60	40	100	6
103 Business Environment*	GE	60	40	100	4
104 English Language	AE	60	40	100	4
SEMESTER TOTAL				**400**	**20**
CUMULATIVE TOTAL				**400**	**20**

SEMESTER – II					
Course Code & Name	**Course Type**	**Theory Paper**	**Internal Assessment**	**Maximum Marks**	**Credits**
201 Financial Management	Major Core	60	40	100	6
202 Quantitative Techniques	Minor Core	60	40	100	6
203 Start-ups & Entrepreneurship*	GE	60	40	100	4
204 Environmental Studies	AE	60	40	100	4
SEMESTER TOTAL				**400**	**20**
CUMULATIVE TOTAL				**800**	**40**

GE: Generic Elective **AE: Ability Enhancement**

*Students may choose this course as a **Generic Elective** or may choose a Generic Elective Course offered in other UTDs at the same level or may choose a Course offered by MOOCs through SWAYAM.

The student will be awarded Certificate in Business Administration (CBA) on successful completion of first year.

2nd Year

SEMESTER – III					
Course Code & Name	**Course Type**	**Theory Paper**	**Internal Assessment**	**Maximum Marks**	**Credits**
301 Marketing Management	Major Core	60	40	100	6
302 Financial Accounting & Tally	Minor Core	60	40	100	6
303 Indian Ethos for Effective Management	GE	60	40	100	4
304 Computers for Management	SE	60	40	100	4
SEMESTER TOTAL				**400**	**20**
CUMULATIVE TOTAL				**1200**	**60**

SEMESTER – IV					
Course Code & Name	**Course Type**	**Theory Paper**	**Internal Assessment**	**Maximum Marks**	**Credits**
401 Human Resources Management	Major Core	60	40	100	6
402 Business Laws	Minor Core	60	40	100	6
403 Digital Marketing*	GE	60	40	100	4
404 Communication Skills	SE	60	40	100	4
SEMESTER TOTAL				**400**	**20**
CUMULATIVE TOTAL				**1600**	**80**

GE: Generic Elective **SE: Skill Enhancement**

*Students may choose this course as a **Generic Elective** or may choose a Generic Elective Course offered in other UTDs at the same level or may choose a Course offered by MOOCs through SWAYAM.

The student will be awarded Diploma in Business Administration (DBA) on successful completion of second year.

3rd Year

SEMESTER – V					
Course Code & Name	**Course Type**	**Theory Paper**	**Internal Assessment**	**Maximum Marks**	**Credits**
501 Production Management	Major Core	60	40	100	6
502 F Working Capital Management** 502 M Consumer Behaviour** 502 H Human Resources Development**	DSE	60	40	100	4
503 Personality Development & Character Building	SE	60	40	100	4
504 Field Project	Core			100	6
SEMESTER TOTAL				400	**20**
CUMULATIVE TOTAL				**2000**	**100**

SEMESTER – VI					
Course Code & Name	**Course Type**	**Theory Paper**	**Internal Assessment**	**Maximum Marks**	**Credits**
601 Management Information System	Major Core	60	40	100	6
602 F Financial Control System** 602 M Sales Management ** 602 H Wages And Salary Administration**	DSE	60	40	100	4
603 F E-Accounting & Taxation with GST** 603 M Advertising & Sales Promotion** 603 H Industrial & Labour Laws**	DSE	60	40	100	4
604 Internship	Core			100	6
SEMESTER TOTAL				**400**	**20**
CUMULATIVE TOTAL				**2400**	**120**

SE: Skill Enhancement DSE: Discipline Specific Elective

Student may choose any one set of specialization Course; Finance, Marketing or HRM (Group F or M or H) as **Discipline Specific Electives.

The student will be awarded Bachelor Degree in Business Administration (BBA) on successful completion of third year.

4th Year

SEMESTER – VII					
Course Code & Name	**Course Type**	**Theory Paper**	**Internal Assessment**	**Maximum Marks**	**Credits**
701 Strategic Management	Major Core	60	40	100	6
702 F. Project Management** 702 M. Retail Management** 702 H. Organisational Development	DSE	60	40	100	4
703 Research Methodology	Minor Core	60	40	100	4
704 Research Project	Core			100	6
SEMESTER TOTAL				**400**	**20**
CUMULATIVE TOTAL				**2800**	**140**

SEMESTER – VIII					
Course Code & Name	**Course Type**	**Theory Paper**	**Internal Assessment**	**Maximum Marks**	**Credits**
801 International Business	Major Core	60	40	100	6
802 Operations Research	Minor Core	60	40	100	4
803 Internship & Dissertation	Core			100	10
SEMESTER TOTAL				**300**	**20**
CUMULATIVE TOTAL				**3200**	**160**

DSE: Discipline Specific Elective
****Student may choose any one set of specialization Course; Finance, Marketing or HRM (Group F or M or H) as **Discipline Specific Electives**.

The student will be awarded Honors Bachelor Degree in Business Administration (BBA Honors) on successful completion of fourth year.

Credit Distribution as per the Ordinance 14 A

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		Main Faculty (as per prerequisite)			Any Faculty	Skill Enhancement Course (SEC)	Ability Enhancement Course (AEC)	Field Projects/ internship/ apprenticeship /community engagement & service	Credits	Qualification Title (Credits Requirements)
		Subject I		Subject II	Subject III					
Level	Sem	Major		Minor	Generic Elective Course	Vocational Course		#Inter/Intra Faculty		
		Core	DSE							
Level 5	1	6		6	4	-	4	-	6+6+4+4 =20	(40) Undergraduate Certificate in Main Faculty
	2	6		6	4	-	4	-	6+6+4+4 =20	
Level 6	3	6		6	4	4	-	-	6+6+4+4 =20	(80) Undergraduate Diploma in Main Faculty
	4	6		6	4	4	-	-	6+6+4+4 =20	
Level 7	5	6	4	-	-	4	-	6	6+4+4+6 =20	(120) Bachelor Degree in Main Faculty
	6	6	4+4	-	-	-	-	6	6+4+4+6 =20	
Level 8	7	6	4	4 Resear-ch Metho-dology	-	-	-	6	4+4+4+6 =20	(160) Bachelor Degree (Honours/Research) in Main Faculty
	8	6	-	4	-	-	-	10	6+4+10 = 20	
Total		48	16	32	16	12	8	28	160 Credits	

DEPARTMENT OF BUSINESS ADMINISTRATION

AWADHESH PRATAP SINGH UNIVERSITY
REWA (MP)

Bachelor of Business Administration (BBA)
Full-Time Eight Semester Programme

Choice Based Credit System (CBCS)

SYLLABUS

Session: 2021-22

101: MANAGEMENT PROCESS & ORGANISATIONAL BEHAVIOUR

Course Objective:
To help the students to acquire basic knowledge in concepts and theory of Principles of Management and to familiarize the students with basic management concepts and behavioural processes in the organization.

Course Contents:

UNIT - I Principles of Management, Management School & Thoughts, Functions and Responsibilities of management, Management in Indian Culture and tradition.

UNIT - II Planning: Process, types and Significance, Objective, strategies and Policies, MBO. Planning for start –ups, Organizing: nature and purpose of organizing, Concepts of departments, line and staff relationship, Types of organisational structures.

UNIT - III Direction: Principles and techniques. Leadership: Concept, Theories and Styles; Qualities of a good leader. Motivation: Types & Significance. Controlling: the system and process of controlling, Control techniques. Coordination as an essence of management;

UNIT - IV Concept of Organisational Behaviour, Contributing Disciplines to organisational Behaviour. Perception- Perceptual selectivity, Perceptual organisation, Attitudes and Values.

UNIT - V Group Dynamics- Group Formation, Nature of groups, Reasons for joining Groups, Functions of group within organisation, Stress Management- Meaning, Cause, Effect and Coping Strategies for Stress

Outcome:
Business Environment and Domain Knowledge
This course will enable participants to understand the basic concepts, principles and process of management. They will be acquainted with the functions, responsibilities of managers along with understanding of how people behave under different conditions and why they behave as they do. Participants would be able to integrate the learning in handling managerial jobs at several levels in the organisation and evaluate most optimal solution to the problems by gaining better understanding on the complexities associated with management of group behaviour in the organisation.

Suggested Readings:
1. Rovwer J.C. & Daniel L., Management principles & Practice, John Wile & Sons.
2. Koontz D and Welhrich, Management, International Student Edition, Tokyo 1980.
3. Agrawal R.D., Organisation & Management MC Graw Hill, New Delhi 1982.
4. Newman and Warran, The Process of Management: Concepts, Behaviour and Practices, PHI.
5. Shekcharan Uma, Organisational Behaviour, Text & Cases, New Delhi THM, 1989.

List of Cases, Recent Articles and Specific References will be announced in the Class Room at the time of launching of the course.

102: BASICS OF ECONOMICS

Course Objective:

The course aims to acquaint students with basic fundamentals of microeconomic theory. It will enhance the skills of students in tabular and graphic interpretation of the economic concepts and theory in decision making of a firm and its application in management.

Course Contents:

UNIT - I Introduction to Economics, Nature and Scope of Economics, Methods of Economics. Managerial Economics: Meaning and Scope, Relationship with Other Disciplines. Factors of Production: Theories of Rent, Interest and Profit.

UNIT - II Concept of Demand & supply, Concept of Market Equilibrium, Elasticity Of Demand & supply**,** Shift in demand& supply curve. Utility Analysis, Marginal Concept Of Utility. Indifference Curve Analysis: Assumptions, Properties Of IC. Consumer's Equilibrium: Maximising Satisfaction**.**

UNIT - III National Income: Estimates and analysis, Measures of National Income, GNP, NNP, GDP, DPI and HDI. Business Cycles: Phases, Govt. Policies and Impact on Society.

UNIT - IV Market: Different Types Of Market, Market Structure: Main Features, Perfect Competitions: Main Features, Price Determination in Perfectly Competitive Firm

UNIT - V Theory of firm: Profit maximization and Sales maximization; Balance of trade and Balance of payment; Production Theory: Short term and long term production functions.

Outcome:

Business Environment and Domain Knowledge

This course will acquaint the participants with role of economics in business management. Their understands of concepts of various market structures, demand and supply functions, demand forecasting and different pricing techniques will enable them to take optimum decisions in their business under different market conditions.

Suggested Readings:

1. Adhikary M., Business Economics, New Delhi, Excel Books, 2000.
2. Chopra O P, Managerial Economics, New Delhi, TMH, 1985.
3. Koutsoyiannis A., Modern Micro Economics, New York Mac Millian, 1991.
4. Keat, Paul G & Philips K. Y. Young, managerial Economics, Prentice hall, New Jeresy, 199

List of Cases, Recent Articles and Specific References will be announced in the Class Room at the time of launching of the course.

103: BUSINESS ENVIRONMENT

Course Objectives:
The aim of this paper is to acquaint students with environmental factors and their relevance in the business and to expose them to the latest changes in the economic scene of the country as well as the global business scenario.

Course Contents:

UNIT - I Introduction to Business Environment, Classification of Business Environment, Factors Affecting Business, Role of Environment in Business, Strategy to Change Environment

UNIT - II Economic & Political Environment: Economic Environment of Business, Economic Policies: Old & New, Five Year Plans, Political Environment & Economic System, Indian Constitution & Business, Changing Profile Of Indian Economy, Business Risk Posed by Indian Political System

UNIT - III Technological Environment: Introduction, Level of Technology, Research & Development, Impact of Technology in Business, Relationship Between Business & Technology, Human Factor & Technology, Industrial Policy

UNIT - IV Culture Environment: Introduction, Role & Effect of Culture on Business, Social Responsibility of Business Organizations. Material & Non–Material Culture. VUCA (Volatility Un-Certainty Complexity and Ambiguity)

UNIT - V Global market, pros & cons of global market, world trade organization, joint ventures, and international trade barriers

Outcome:
Business Environment and Domain Knowledge
This course will acquaint the participants with different constituents of environment and their impact on the business operations. The participants will be able to gain an understanding of various micro and macro factors in the environment and how an entity works in a business environment.

Suggested Readings:

1. Aswathappa, K Business Environment for Strategic Management
2. Duttand Sundaram, Indian Economy
3. Mishra and Puri, Indian Economy
4. Cherunilam Francis, Business Environment

List of Cases, Recent Articles and Specific References will be announced in the Class Room at the time of launching of the course.

104: ENGLISH LANGUAGE

Course Objective: The objectives of the course are to improve the competence of the student's basic language skills and to acquaint student with working official English Language.

Course Contents:

I. ***Language content:***

A. Structural Items:
i. Simple, Compound and Complex Sentences.
ii. Co-ordinate clauses (with, but or, neither-no, Otherwise or else)
iii. Sub-ordinate clauses- Noun clauses- as subject object and complement. Relative clauses, (restrictive and non-restrictive clauses) Adverb Clauses (open and hypothetical, conditional: with because, though, where, so, that, as long as, as soon as)
iv. Comparative clauses (as+ adjective / adverb + as no sooner ....that)

B. Tense:
i. Simple present, Progressive and present perfect
ii. Simple past, progressive and past perfect
iii. Indication of futurity

C. The passive (Simple present and past, Present and perfect and to infinitive structure)

D. Reported speech
i. Declarative sentences
ii. Imperatives
iii. Interrogative-wh-questions, yes/no questions
iv. Exclamatory sentences.

E. Modals (Will, shall, would, ought, to have to/have got to, can-could, may-might and need)

F. Verb Structures (infinitive and gerundial)

G. Linking devices

Note: The above language item will be introduced to express the following communicative functions:
a. Seeking and imparting information
b. Expressing attitudes-intellectual and emotional
c. Persuasion and discussion etc.

II ***Reading Comprehension***: Adequate practice should be provided in reading with understanding through graded materials prescribed in the text book. Attempt should also be made to expand the learner's vocabulary.

III ***Writing Skills***: Graded practice should be provided in the basic skills of composition. The following forms of composition should be practiced.

a) Paragraph writing (150 words)
b) Letter Writing (both formal and informal)

IV ***Speaking:*** Contextualized vocabulary teaching and oral work should be used to strengthen the learner's acquirement of the sound distinction, stress and intonation in English.

Outcome: This course will hone reading, writing and over all communication skills of the participants which is very basic and imperative for almost all kind of management jobs in the organisation. The graduates are expected to understand the process of communicating and interpreting the human experiences through literary representation using historical context and disciplinary methodologies.

201: FINANACIAL MANAGEMENT

Course Objective:
The objective is to enable students to understand the basic concepts of Financial Management and the role of Financial Management in decision-making.

Course Contents:

UNIT - I Introduction, Meaning of Finance, Business Finance, Finance Function, Aims of Finance Function, Organization structure of finance, Financial Management – Goals of Financial Management, Financial Decisions, Role of a Financial Manager.

UNIT - II Ratio analysis, Meaning Interpretations of ratios, classification of ratio, funds flow and cash flow analysis.

UNIT - III Capital structure, source of capital, leverage: financial and operating, optimum Capital structure, Theories of Capital structure, Factors influencing Capital structure. Capitalization: over capitalization analysis, under capitalization.

UNIT - IV Concept of time value of money, Capital budgeting, methods of investments evaluation, payback period and accounting rate of return, discounted cash flow method and internal rate of return.

UNIT - V Dividend decision of the firm, dividend payment and valuation of Firm's dividend policy, Determinants of dividend policy & Types of dividend policy.

Outcome:
Business Environment and Domain Knowledge
The Graduates will acquire the knowledge on allocation and management of financial resources which will help them to deal with day to day working capital decisions, major capital investment decisions and raising long term finances.

Suggested Readings:
1. Van Horne, James C, Financial Decision Making Engle Cliffs, New Jersey, Prentice Hall Inc.
2. Bhalla V.K., Financial Management and Policy, New Delhi.

List of Cases, Recent Articles and Specific References will be announced in the Class Room at the time of launching of the course.

202: QUANTITATIVE TECHNIQUES

Course Objective:
The objective of the course is to provide elementary knowledge of the concepts of Quantitative Techniques and their application in business field.

Course Contents:

UNIT - I Linear Equation and Calculus: Equation in two variable, solution to Linear Equation, Linear Equalities and Inequalities, Graphical solution; Differential Calculus and Integral Calculus: Optimization using calculus, logarithms

UNIT - II Matrices: Introduction, Types and Properties of matrices: Addition, subtraction and multiplication, Cofactor, Ad joint, Transpose, Inverse
.
UNIT - III Introduction to Statistics: Definition of statistics, scope of statistics, limitations of statistics, Types of data: Primary and Secondary data, Methods of collecting primary data, Construction of frequency distribution

UNIT - IV Measures of central tendency: Measures of central tendency: Mean Median Mode (all for grouped and ungrouped data). Mean deviation, Standard Deviation, Skewness.

UNIT - V Correlation and Regression Analysis: Correlation, Karl Pearson coefficient of Correlation, Spearman's Rank Correlation, Regression analysis.

Outcome:
Critical thinking, Business Analysis, Problem Solving and Innovative Solutions
The participants will be able to learn basics of mathematics and statistics applicable in business which will help them to translate a problem in the real business into simple mathematical model to allow easier understanding and aid in problem solving. This will also hone the critical thinking, analytical skills and problem solving ability of the graduates.

Suggested Readings:

1.	Levin Rechard I	:	Statistics for Management
2.	Gupta, C.B.	:	An Introduction to Statistics.
3.	Gupta. S.C	:	Fundamentals of Statistics.
4.	Elhance, D.N	:	Fundamentals of Statistics.
5.	Ray & Sharma	:	Statistics.
6.	Raghavchari, C.	:	Business Mathematics.

List of Cases, Recent Articles and Specific References will be announced in the Class Room at the time of launching of the course.

203: STARTUPS & ENTREPRENEURSHIP

Course Objective:
The objective of the course is to familiarize participants with various concepts used in the process of entrepreneurship and start ups.

Course Contents:

UNIT - I Concept and Nature of Entrepreneurship, Entrepreneurial Trait, Types and Significance, Role and Importance of entrepreneur in economic growth.

UNIT - II Entrepreneurial Development programmes in India, History, Support, Objectives, Stages of Performance, Entrepreneurial Environment, EDP and their valuation.

UNIT - III Entrepreneurial Behaviour and entrepreneurial Motivation, N- Achievement and Management success. Innovation and Entrepreneur, Entrepreneurial Success in Rural Areas.

UNIT - IV Establishing Entrepreneur System, Search for Business Idea, Sources of Ideas, Idea Processing, Input requirement.

UNIT - V Sources and Criteria of Financing, fixed and Working capital assessment, technical assistance, Marketing assistance, Sickness of units and Remedial assistance.

Outcome:
Developing Social Responsiveness and Leadership-
This course will create an understanding related to the tools necessary to create sustainable and viable businesses. The graduates will be able to generate innovative ideas and exploit market opportunities by turning them into a feasible business plan. They are expected to reciprocate to the requirements of the society by creating unique solutions to the market problems.

Suggested Readings:
1. Desai Vasant, Small Scale Industrial Industries & Entrepreneurship
2. Shukla M.B., Entrepreneurship & Business Management
3. Gupta C.B., Entrepreneurship Development in India

List of Cases, Recent Articles and Specific References will be announced in the Class Room at the time of launching of the course.

204: ENVIRONMENTAL STUDIES

Course Objective:
The aim of this course is to provide basic knowledge of environment and familiarize them with its management.

Course Contents:

UNIT - I Introduction to environmental studies-Multidisciplinary nature of environmental studies; Scope and importance; the need for environmental education. Concept of sustainability and sustainable development.

UNIT - II Ecosystem-What is an ecosystem? Structure: food chains, food webs and function of ecosystem: Energy flow in an ecosystem, nutrient cycle and ecological succession, Ecological Interactions.

UNIT - III Biodiversity - a. Levels of biological diversity: genetic, species and ecosystem diversity; Bio geographic zones of India; Biodiversity patterns and global biodiversity hot spots b. India as a mega-biodiversity nation; Endangered and endemic species of India c. Threats to biodiversity: Habitat loss, poaching of wildlife, man-wildlife conflicts, biological invasions;

UNIT - IV Environmental Pollution and Global Environmental Issues:- a. Environmental pollution, b. Climate change, global warming, ozone layer depletion, acid rain and impacts on human communities and agriculture c. Nuclear hazards and human health risks (Chernobyl, 3 mile Island, Daiichi-Fukushima) d. Solid waste management; Pollution Tragedies: Love canal, Bhopal Gas, Endosulfan, Minamata and Flint water

UNIT - V Environmental Management: Policies & Practices-Environmental ethics: Role of Indian and other religions and cultures in environmental conservation. Green Politics, Earth Hour, Green Option Technologies. Environmental communication and public awareness, Role of National Green Tribunal.

Outcome:
The course will install an in-depth knowledge on natural process essential to sustain life and govern economy. This will develop the critical thinking and analytical ability among the participants to strategize for environmental protection and conservation of biodiversity. The graduates are expected to develop empathy for different life forms and appreciate the ecological linkages within web of life.

Suggested Readings:
1. Basu, M. and Xavier, S., Fundamentals of Environmental Studies, Cambridge University Press.
2. Mitra, A. K and Chakraborty, R., Introduction to Environmental Studies, Book Syndicate.
3. Enger E. and Smith B., Environmental Science: A Study of Interrelationships, McGraw-Hill Higher Education.
4. Basu, R.N, Environment, University of Calcutta.

List of Cases, Recent Articles and Specific References will be announced in the Class Room at the time of launching of the course.

CURRICULUM FRAMEWORK:
TWO-YEAR B.P.ED. PROGRAMME

NATIONAL COUNCIL FOR TEACHER EDUCATION
Hans Bhawan (Wing-II),
1, Bahadur Shah Zafar Marg,
New Delhi-110 002
www.ncte-india.org

GUIDELINES OF REGULATIONS AND MODEL SYLLABUS STRUCTURE FOR B. P. ED. TWO YEARS PROGRAMME (FOUR SEMESTERS)(CBCS)

(If the University or affiliating body is following choice based credit system, (CBCS) as approved and Circulated by the UGC, the credit hours given in the following curriculum framework need to be considered along with the hours of teaching mentioned for each paper/ activity / course)

(If the University oraffiliatingbody isyet to adopt CBCS, only the hours of teaching mentioned for each paper/ activity / course will be considered, the credit in teaching hours may be ignored)

Preamble: Bachelor of Physical Education (B. P. Ed.) two years (Four Semesters Choice Based Credit System) programme is a professional programme meant for preparing teachers of physical education in classes VI to X and for conducting physical education and sports activities in classes XI and XII.

B. P. Ed. programme shall be designed to integrate the study of childhood, social context of Physical Education, subject knowledge, pedagogical knowledge, aim of Physical Education and communication skills. The programme comprises of compulsory and optional theory as well as practical courses and compulsory school internship.

R.B.P.Ed. 1.Eligibility

Intake, Eligibility and Admission Procedure as per the NCTE norms and standards

R. B.P.Ed. 2. Duration:

The B.P.Ed programme shall be of a duration of two academic years,that is, four semesters. However, the students shall be permitted to complete the programme requirements within a maximum of three years from the date of admission to the programme.

R. B.P.Ed. 3. The CBCS System:

All Programmes shall run on Choice Based Credit System (CBCS). It is an instructional package developed to suit the needs of students, to keep pace with the developments in higher education and the quality assurance expected of it in the light of liberalization and globalization in higher education.

R. B.P.Ed 4. Course:

The term course usually referred to, as ópapersô is a component of a programme. All courses need not carry the same weight. The courses should define learning objectives and learning outcomes. A course may be designed to comprise Lectures/ tutorials/laboratory work/ field work/ outreach activities/ project work/ vocational training/viva/ seminars/ term papers/assignments/ presentations/ self-study etc. or a combination of some of these.

R. B.P.Ed. 5. Courses of Programme:

The B.P.Ed. Programme consists of a number of courses, the term óCourseô applied to indicate a logical part of subject matter of the programme and is invariably equivalent to the subject matter of a ñpaperò in the conventional sense. The following are the various categories of courses suggested for the B.P.Ed. Programme.

Theory:

Core Course:

Elective Course:

Practicum:

Teaching Practices:

R. B.P.Ed.6. Semesters:

An academic year is divided into two semesters. Each semester will consist of 17-20 weeks of academic work equivalent to 100 actual teaching days. The odd semester may be scheduled from May/June to November/Decemberand even semester from November / December to May/June. The institution shall work for a minimum of 36 working hours in a week (five or six days a week).

R. B.P.Ed.7. Working days:

There shall be at least 200 working days per year exclusive of admission and examination processes etc.

R. B.P.Ed 8. Credits:

The term 'Credit' refers to a unit by which the programme is measured. It determines the number of hours of instructions required per week. One credit is equivalent to one hour of teaching (lecture or tutorial) or one and half / two hours of practical work/field work per week.The term 'Credit' refers to the weight given to a course, usually in relation to the instructional hours assigned to it. The total minimum credits, required for completing a B.P.Ed. Programme is 90 credits and for each semester 20 credits.

Provision of Bonus CreditsMaximum 06 Credits in each Semester

Sr. No.	Special Credits for Extra Co-curricular Activities	Credit
1	Sports Achievement at Stale level Competition (Medal Winner) Sports Achievement National level Competition (Medal Winner) Sports participationInternational level Competition	1 2 4
2	Inter Uni. Participation (Any one game)	2
3	Inter College Participation (min. two game)	1
4	National Cadet Corps / National Service Scheme	2
5	Blood donation / Cleanliness drive / Community services /	2
6	Mountaineering ï Basic Camp, Advance Camp / Adventure Activities	2
7	Organization / Officiating ï State / National level in any two game	2
8	News Reposting / Article Writing / book writing / progress report writing	1
9	Research Project	4

Students can earn maximum 06 Bonus credits in each semester by his/her participation in the above mentioned activities duly certified by the Head of the institution / Department. This Bonus credit will be used only to compensate loss of credits in academic activities.

R. B.P.Ed. 9. Examinations:

i. There shall be examinations at the end of each semester, for first semester in the month of November /December: for second semester in the month of May / June. A candidate who does not pass the examination in any course(s) shall be permitted to appear in such failed course(s) in the subsequent examinations to be held in November /December or May / June.

ii. A candidate should get enrolled /registered for the first semester examination. If enrollment/registration is not possible owing to shortage of attendance beyond condonation limit / rules prescribed OR belated joining OR on medical grounds, such candidates are not permitted to proceed to the next semester. Such candidates shall redo the semester in the subsequent term of that semester as a regular student; however, a student of first semester shall be admitted in the second semester, if he/she has successfully kept the term in first semester.

R. B.P.Ed 10 Condonation:

Student must have 75% of attendance in each course for appearing the examination. Students who have 74% to 65% of attendance shall apply for condonation in the prescribed form with the prescribed fee. Students who have 64% to 50% of attendance shall apply for

condonation in prescribed form with the prescribed fee along with the Medical Certificate. Students who have below 50% of attendance are not eligible to appear for the examination.

R. B.P.Ed 11. Pattern of Question Papers:

Question Papers shall have five questions corresponding to four units of each theory course.

B.P.Ed.: Format of Question Paper for 4 Units.

Each question paper shall have five questions. The pattern will be as follows:

Question No.	Description	Marks
1	Answer in detail (Long Question) Or Answer in detail (Long Question) (Form Unit 1)	15
2	Answer in detail (Long Question) Or Answer in detail (Long Question) (Form Unit 2)	15
3	Answer in detail (Long Question) Or Answer in detail (Long Question) (Form Unit 3)	15
4	Write short notes: any two out of four (Form Unit 4)	15
5	M.C.Q. Type Questions (10 out of 12 Que.) (3 Questions. from each unit)	10
	Total	**70**

R. B.P.Ed. 12. Evaluation:

The performance of a student in each course is evaluated in terms of percentage of marks with a provision for conversion to grade point. Evaluation for each course shall be done by a continuous internal assessment (CIA) by the concerned course teacher as well as by end semester examination and will be consolidated at the end of course. The components for continuous internal assessment are;

One Test	15 Marks
Seminar / Quiz	5 Marks
Assignments	5 Marks
Attendance	5 Marks
Total	30 Marks

Attendance shall be taken as a component of continuous assessment, although the students should have minimum 75% attendance in each course. In addition to continuous evaluation component, the end semester examination, which will be written type examination of at least 3 hours duration, would also form an integral component of the evaluation. The ratio of marks to be allotted to continuous internal assessment and to end semester examination is 30:70. The evaluation of practical work, wherever applicable, will also be based on continuous internal assessment and on an end-semester practical examination.

R. B.P.Ed. 13. Minimum Passing Standard:

The minimum passing standard for CIA (Continuous Internal Assessment) and External Examinations shall be 40%, i.e. 12 marksout of 30 marks and 28 marks out of 70 marks respectively for theory courses.The minimum passing for both CIA & external examination shall be 50%,i.e. 15 marks out of 30 and 35 marks out of 70 marks for the practical courses.

R. B.P.Ed 14. Grading:

Once the marks of the CIA (Continues Internal Assessment) and SEA (Semester End Assesment) for each of the courses are available, both (CIA and SEA) will be added. The marks thus obtained for each of the courses will then be graded as per details provided in R. B.P.Ed. 17 from the first semester onwards the average performance within any semester from the first semester is indicated by Semester Grade Point Average (SGPA) while continuous performance (including the performance of the previous semesters also) starting from the first semesteris indicated by Cumulative Grade Point Average (CGPA). These two are calculated by the following formula:

$$\text{SGPA} = \frac{\sum_{i=1}^{n} C_i G_i}{\sum_{i=1}^{n} C_i}$$

$$\text{CGPA} = \frac{\sum_{j=1}^{N} \text{SGPA}_j}{N}$$

Where C*i* is the Credit earned for the course is in any semester; G*i* is the Grade point obtained by the student for the course *i* and *n* number of courses obtained in that semester; $\text{SGPA}_j$is SGPA of semester *j* and *N* number of semester. Thus CGPA is average of SGPA of all the semesters starting from the first semester to the current semester.

R. B.P.Ed. 15. Classification of Final Results:

For the purpose of declaring a candidate to have qualified for the Degree of Bachelor of Physical Education in the First class / Second class / Pass class or First class with Distinction, the

marks and the corresponding CGPA earned by the candidate in Core Courses will be the criterion. It is further provided that the candidate should have scored the First / Second Class separately in both the grand total and end Semester (External) examinations.

R. B.P.Ed.16. Award of the B.P.Ed. Degree:

A candidate shall be eligible for the award of the degree of the B.P.Ed. only if he/she has earned the minimum required credit including Bonus Credits of the programme prescribed above.

R. B.P.Ed.17. Letter Grades and Grade Points:

i. Two methods-relative grading or absolute gradingï have been in vogue for awarding grades in a course. The relative grading is based on the distribution (usually normal distribution) of marks obtained by all the students in the course and the grades are awarded based on a cut-off mark or percentile. Under the absolute grading, the marks are converted to grades based on pre-determined class intervals. To implement the following grading system, the colleges and universities can use any one of the above methods.

ii. The grades for each course would be decided on the basis of the percentage marks obtained at the end-semester external and internal examinations as per following table:

Percentage	Grade Point	Latter Grade	Description	Classification of final result
85 & above	8.5-10.0	O	Outstanding	First class with Distinction
70-84.99	7.0-8.49	A^+	Excellent	
60-69.99	6.0-6.99	A	Very Good	First Class
55-59.99	5.5-5.99	B+	Good	Higher Second Class
50-54.99	5.0-5.49	B	Above Average	Second Class
40-49.99	4.0-4.99	C	Average	Pass Class
Below 40	0.0	F	Fail/ Dropped	Dropped
	0	AB	Absent	

R. B.P.Ed.18. Grade Point Calculation

Calculation of **Semester Grade Point Average (SGPA)** and **Credit Grade Point (CGP)** and declaration of class for B. P. Ed. Programme.

The credit grade points are to be calculated on the following basis:

$$\text{SGPA} = \frac{\sum_{\text{course}} C_i G_i}{\sum_{\text{course}} C_i}$$

Example – I

Marks obtained by Student in course CC101 = 65/100

Percentage of marks = 65 %

Grade from the conversion table is = A

Grade Point = 6.0 + 5 (0.99/9.99)
= 6.0 + 5x0.1
= 6.0+ 0.5
=6.5
The Course Credits = 04
Credits Grade Point (CGP) = 6.5 × 04 = 26

The semester grade point average (SGPA) will be calculated as a weighted average of all the grade point of the semester courses. That is Semester grade point average (SGPA) = (sum of grade points of all eight courses of the semester) / total credit of the semester as per example given below:

SEMESTER-1

Courses No.	Credit	Marks out of 100 (%)	Grade	Grade Point	Credit Grade point
CC-101	4	65	A	6.5	26
CC-102	4	60	A	6	24
CC-103	4	62	A	6.2	24.8
EC-101/EC-102	4	57	B+	5.7	22.8
PC-101	4	55	B+	5.5	22
PC-102	4	72	A+	7.2	28.8
PC-103	4	66	A	6.6	26.4
PC - 104	4	72	A+	7.2	28.8
	32				203.6

Examples: Conversion of marks into grade points

CC-101 65 = 60 + 5 = 6.0 + 5 x (0.99 / 9.99) = 6.0 + 5 x 0.1 = 6.0 + 0.5 = 6.5
CC-102 60 = 6.0
CC-103 62 = 60 + 2 =6.0 + 2 x (0.99/9.99) = 6.0 + 2 x 0.1 = 6.0 + 0.2 = 6.2
EC-101/EC-102 57 = 55 + 2 = 5.5 + 2 x (0.49 / 4.99) = 5.5 + 2 x 0.1 = 5.5 + 0.2 = 5.7
PC-101 55 = 5.5
PC-102 72 = 70 + 2 = 7.0+ 2 x (1.49 /14.99) = 7.0 + 2 x 0.1 = 7.0 +0.2 = 7.2
PC-103 66 = 60 + 6 = 6.0 + 6 x (0.99 / 9.99) = 6.0 + 6 x 0.1 = 6.0 + 0.6 = 6.6
PC – 104 72 = 70 + 2 = 7.0+ 2 x (1.49 /14.99) = 7.0 + 2 x 0.1 = 7.0 +0.2 = 7.2

SEMESTER GRADE POINT AVERAGE (SGPA) = Total Credit Grade Points
= 203.6 /32 = 6.3625
SGPA Sem. I = 6.3625
At the end of Semester-1
Total SGPA = 6.3625
Cumulative Grade Point Average (CGPA) = 6.3625/1 = 6.3625

CGPA = 6.66875, Grade = A, Class = First Class

SEMESTER-2

Courses No.	Credit	Marks out of 100 (%)	Grade	Grade Point	Credit Grade point
CC-201	4	76	A+	7.6	30.4
CC-202	4	64	A	6.4	25.6
CC-203	4	59	B+	5.9	23.6
EC-201/EC-202	4	80	A+	8	32
PC-201	4	49	C	4.9	19.6
PC-202	4	64	A	6.4	25.6
PC-203	4	55	B+	5.5	22
TP - 201	4	72	A+	7.2	28.8
	32				207.6

SGPA Sem. II = 6.4875

At the end of Semester-2

Total SGPA for two Semesters = 12.85
Cumulative Grade Point Average (CGPA) = 12.85/2 = 6.425
CGPA = 6.66875, Grade = A, Class = First Class

SEMESTER-3

Courses No.	Credit	Marks out of 100 (%)	Grade	Grade Point	Credit Grade point
CC-301	4	64	A	6.4	25.6
CC-302	4	64	A	6.4	25.6
CC-303	4	59	B+	5.9	23.6
EC-301/EC-302	4	81	A+	8.1	32.4
PC-301	4	49	C	4.9	19.6
PC-302	4	64	A	6.4	25.6
PC-303	4	68	A	6.8	27.2
TP - 301	4	75	A+	7.5	30
	32				209.6

SGPA Sem. III = 6.55
At the end of Semester-3

Total SGPA for three Semesters = 19.4
Cumulative Grade Point Average (CGPA) = 19.4/3 = 6.466667
CGPA = 6.66875, Grade = A, Class = First Class

SEMESTER-4

Courses No.	Credit	Marks out of 100 (%)	Grade	Grade Point	Credit Grade point
CC-401	4	83	A+	8.3	33.2
CC-402	4	76	A+	7.6	30.4
CC-403	4	59	B+	5.9	23.6
EC-401/EC-402	4	81	A+	8.1	32.4
PC-401	4	49	C	4.9	19.6
PC-402	4	78	A+	7.8	31.2
TP-401	4	81	A+	8.1	32.4
TP-402	4	75	A+	7.5	30
	32				232.8

SGPA Sem. IV = 7.275

At the end of Semester-4

Total SGPA for all the four semesters = 26.675

Cumulative Grade Point Average (CGPA) = 26.675 /4 = 6.66875

CGPA = 6.66875, Grade = A, Class = First Class

Note:

(1) SGPA is calculated only if the candidate passes in all the courses i.e. get minimum C grade in all the courses.

(2) CGPA is calculated only when the candidate passes in all the courses of all the previous and current semesters.

(3)The cumulative grade point average will be calculated as the average of the SGPA of all the semesters continuously, as shown above.

(4)For the award of the class, CGPA shall be calculated on the basis of:

(a) Marks of each Semester EndAssesment And

(b) Marks of each Semester Continuous Internal Assessment for each course. The final Class for B.P.Ed. Degree shall be awarded on the basis of last CGPA (grade) fromall theone to four semester examinations.

R. B.P.Ed.19. Grievance Redressal Committee:

The college/department shall form a Grievance Redressal Committee for each course in each college/department with the course teacher / Principal / Director and the HOD of the faculty as the members. This Committee shall solve all grievances of the students.

R. B.P.Ed.20. Revision of Syllabi:

1. Syllabi of every course should be revised according to the NCTE.
2. Revised Syllabi of each semester should be implemented in a sequential way.
3. In courses, where units / topics related to governmental provisions, regulations or laws, that change to accommodate the latest developments, changes or corrections are to be made consequentially as recommended by the Academic Council.

4. All formalities for revisions in the syllabi should be completed before the end of the semester for implementation of the revised syllabi in the next academic year.
5. During every revision, up to twenty percent of the syllabi of each course should be changed so as to ensure the appearance of the students who have studied the old (unrevised) syllabi without any difficulties in the examinations of revised syllabi.
6. In case, the syllabus of any course is carried forward without any revision, it shall also be counted as revised in the revised syllabi.

Semester - I

PartA:TheoreticalCourse						
Course Code	TitleofthePapers	Total Hours	Credit	Internal Marks	External Marks	Total Marks
CoreCourse						
CC-101	History, Principles and foundation of Physical Education	4	4	30	70	100
CC-102	Anatomy and Physiology	4	4	30	70	100
CC-103	Health Education and Environmental Studies	4	4	30	70	100
Elective Course (Anyone)						
EC-101	Olympic Movement	4	4	30	70	100
EC-102	Officiating and Coaching					
Part–B PracticalCourse						
PC-101	Track and Field (Running Events)	**6**	**4**	30	70	100
PC-102	Swimming/Gymnastics/ Shooting	**6**	**4**	30	70	100
PC-103	Indigenous Sports: Kabaddi / Malkhambh/ lezim / March past	**6**	**4**	30	70	100
PC - 104	Mass Demonstration Activities: Kho-Kho / dumbbells / tipri / wands / hoop /umbrella	**6**	**4**	30	70	100
Total		40	32	240	560	800

Note: Total Number of hours required to earn 4 credits foreach Theory Course are 68-80 hours per semester whereas 102-120 hours foreach Practicum Course.

Semester - II

PartA:TheoreticalCourse						
Course Code	TitleofthePapers	Total Hours	Credit	Internal Marks	External Marks	Total Marks
CoreCourse						
CC-201	Yoga Education	4	4	30	70	100
CC-202	Educational Technology and Methods of Teaching in Physical Education	4	4	30	70	100
CC-203	Organization and Administration	4	4	30	70	100
Elective Course (Anyone)						
EC-201	Contemporary issues in physical education, fitness and wellness	4	4	30	70	100
EC-202	Sports Nutrition and Weight Management					
Part–B PracticalCourse						
PC-201	Track and Field (Jumping Events)	**6**	**4**	30	70	100
PC-202	Yoga/Aerobics/ Gymnastics/ Swimming	**6**	**4**	30	70	100
PC-203	Racket Sports: Badminton/ Table Tennis/ Squash/ Tennis	**6**	**4**	30	70	100
Part – C Teaching Practices						
TP - 201	Teaching Practices (05lessons in class room teaching and 05 lessons in outdoor activities)	**6**	**4**	30	70	100
Total		40	32	240	560	800

Note: Total Number of hours required to earn 4 credits foreach Theory Course are 68-80 hours per semester whereas 102-120 hours for each Practicum Course.

Semester - III

PartA:TheoreticalCourse						
Course Code	TitleofthePapers	Total Hours	Credit	Internal Marks	External Marks	Total Marks
CoreCourse						
CC-301	Sports Training	4	4	30	70	100
CC-302	Computer Applications in Physical Education	4	4	30	70	100
CC-303	Sports Psychology and Sociology	4	4	30	70	100
Elective Course (Anyone)						
EC-301	Sports Medicine, Physiotherapy and Rehabilitation	4	4	30	70	100
EC-302	Curriculum Design					
Part–B PracticalCourse						
PC-301	Track and Field (Throwing Events)	**6**	**4**	30	70	100
PC-302	Combative Sports: Martial Art/ Karate/ Judo/ Fencing/ Boxing/ Taekwondo/ Wrestling (Any two out of these)	**6**	**4**	30	70	100
PC-303	Team Games: Baseball/ Cricket/ Football/ Hockey/ Softball/ Volleyball/ Handball/ Basketball/ Netball (Any two of these)	**6**	**4**	30	70	100
Part – C Teaching Practices						
TP - 301	Teaching Practice: (Teaching Lesson Plans for Racket Sport/ Team Games/Indigenous Sports) (out of 10 lessons 5 internal and 5 external at practicing school)	**6**	**4**	30	70	100
Total		40	32	240	560	800

Note: Total Number of hours required to earn 4 credits foreach Theory Course are 68-80 hours per semester whereas 102-120 hours for each Practicum Course.

Semester - IV

PartA:TheoreticalCourse						
Course Code	TitleofthePapers	Total Hours	Credit	Internal Marks	External Marks	Total Marks
CoreCourse						
CC-401	Measurement and Evaluation in Physical Education	4	4	30	70	100
CC-402	Kinesiology and Biomechanics	4	4	30	70	100
CC-403	Research and Statistics in Physical Education	4	4	30	70	100
Elective Course (Anyone)						
EC-401	Theory of sports and game	4	4	30	70	100
EC-402	Sports Management					
Part–B PracticalCourse						
PC-401	Track and Field / Swimming / Gymnastics (Any one out of three)	**6**	**4**	30	70	100
PC-402	Kabaddi/ Kho-Kho/ Baseball/ Cricket/ Football/Hockey/Softball/ Volleyball/ Handball/ Basketball/ Netball/ Badminton/ Table Tennis/ Squash/ Tennis (Any Two of these)	**6**	**4**	30	70	100
Part – C Teaching Practices						
TP-401	Sports specialization: Coaching lessons Plans (One for Sports 5 lessons)	**6**	4	30	70	100
TP-402	Games specialization: Coaching lessons Plans (One for Games 5 lessons)	**6**	4	30	70	100
Total		40	32	240	560	800
		160	128	960	2240	3200

Note: Total Number of hours required to earn 4 credits foreach Theory Course are 68-80 hours per semester whereas 102-120 hours for each Practicum Course.

SCHEME OF EXAMINATION

SEMESTER - I

Paper	Subject	Internal	External	Total Marks
	THEORY (400)			
CC-101	History, Principles and foundation of Physical Education	30	70	100
CC-102	Anatomy and Physiology	30	70	100
CC-103	Health Education and Environmental Studies	30	70	100
EC-101/102	Olympic Movement/Officiating and Coaching (Elective)	30	70	100
	PRACTICAL (400)			
PC-101	Track and Field (Running Events)	30	70	100
PC-102	Swimming/Gymnastics/Shooting	30	70	100
PC-103	Indigenous Sports: Kabaddi/ Malkhambh/ lezim / March past (Any of one out of these)	30	70	100
PC-104	Mass Demonstration Activities: Kho-Kho / dumbbells / tipri / wands / hoop /umbrella (Any one out of these)	30	70	100
	Total	**240**	**560**	**800**

SEMESTER -II

Paper	Subject	Internal	External	Total Marks
	THEORY (400)			
CC-201	Yoga Education	30	70	100
CC-202	Educational Technology and Methods of Teaching in Physical Education	30	70	100
CC-203	Organization and Administration	30	70	100
EC-201/202	Contemporary issues in physical education, fitness and wellness/ Sports Nutrition and Weight Management (Elective)	30	70	100
	PRACTICAL (300)			
PC-201	Track and Field (Jumping Events)	30	70	100
PC-202	Yoga/Aerobics / Swimming / Gymnastics (Any of the two out of these)	30	70	100
PC-203	Racket Sports: Badminton/ Table Tennis/ Squash/ Tennis (Any of the two out of these)	30	70	100
	TEACHING PRACTICE (100)			
TP-201	Teaching Practice (Classroom and outdoor)	30	70	100
	Total	**240**	**560**	**800**

SEMESTER –III

Paper	Subject	Internal	External	Total Marks
	THEORY (400)			
CC-301	Sports Training	30	70	100
CC-302	Computer Applications in Physical Education	30	70	100
CC-303	Sports Psychology and Sociology	30	70	100
EC-301/302	Sports Medicine, Physiotherapy and Rehabilitation/Curriculum Design (Elective)	30	70	100
	PRACTICAL (300)			
PC-301	Track and Field (Throwing Events)	30	70	100
PC-302	Combative Sports : Martial Art, Karate, Judo, Fencing, Boxing, Taekwondo, Wrestling (Any two out of these)	30	70	100
PC-303	Team Games: Baseball, Cricket, Football, Hockey, Softball, Volleyball, Handball, Basketball, Netball (Any two of these)	30	70	100
	TEACHING PRACTICE (100)			
TP-301	Teaching Practice (Teaching Lesson Plans for Racket Sport/ Team Games/Indigenous Sports)	30	70	100
	Total	**240**	**560**	**800**

SEMESTER -IV

Paper	Subject	Internal	External	Total Marks
	THEORY (400)			
CC-401	Measurement and Evaluation in Physical Education	30	70	100
CC-402	Kinesiology and Biomechanics	30	70	100
CC-403	Research and Statistics in Physical Education	30	70	100
EC-401/402	Theory of sports and games(Specifically sports and games specialization)/Sports Management (Elective)	30	70	100
	PRACTICAL (200)			
PC-401	Track and Field/Swimming /Gymnastics (Any of one out of these)	30	70	100
PC-402	Kabaddi/ Kho-Kho/ Baseball/ Cricket/ Football/Hockey/Softball/ Volleyball/ Handball/ Basketball/ Netball/ Badminton/ Table Tennis/ Squash/ Tennis (Any of one out of these)	30	70	100
	TEACHING PRACTICE (200)			
TP-401	Sports Specialization: Coaching lessons Plans Track and Field/Swimming /Gymnastics (Any of one out of these)	30	70	100
TP-402	Game specialization Coaching lessons: Kabaddi/ Kho-Kho/ Baseball/ Cricket/Football/Hockey /Softball/ Volleyball/ Handball/ Basketball/ Netball/ Badminton/ Table Tennis/ Squash/ Tennis (Any of one out of these)	30	70	100
	Total	**240**	**560**	**800**

B. P. Ed. – Outline of Syllabus

Semester – I

Theory Courses

CC-101 HISTORY, PRINCIPLES AND FOUNDATION OF PHYSICAL EDUCATION

Unit – 1: Introduction

- Meaning, Definition and Scope of Physical Education
- Aims and Objective of Physical Education
- Importance of Physical Education in present era.
- Misconceptions about Physical Education.
- Relationship of Physical Education with General Education.
- Physical Education as an Art and Science.

Unit- 2 – Historical Development of Physical Education in India

- Indus Valley Civilization Period. (3250 BC ï 2500 BC)
- Vedic Period (2500 BC ï 600 BC)
- Early Hindu Period (600 BC ï 320 AD) and Later Hindu Period (320 AD ï 1000 AD)
- Medieval Period (1000 AD ï 1757 AD)
- British Period (Before 1947)
- Physical Education in India (After 1947)
- Contribution of Akhadas and Vyayamshals
- Y.M.C.A. and its contributions.

Unit- 3- Foundation of Physical Education

- Philosophical foundation:
- Idealism, Pragmatism, Naturalism, Realism, Humanism, Existentialism and Indian Philosophy and Culture.
- Fitness and wellness movement in the contemporary perspectives
- Sports for all and its role in the maintenance and promotion of fitness.

Unit-4- Principles of Physical Education

- Biological
    - Growth and development
    - Age and gender characteristics
    - Body Types
    - Anthropometric differences
- Psychological
    - Learning types, learning curve
    - Laws and principles of learning
    - Attitude, interest, cognition, emotions and sentiments

- Sociological
    - Society and culture
    - Social acceptance and recognition
    - Leadership
    - Social integration and cohesiveness

References:

Bucher, C. A. (n.d.) *Foundation of physical education.* St. Louis: The C.V. Mosby Co.

Deshpande, S. H. (2014). *Physical Education in Ancient India*. Amravati: Degree college of Physical education.

Mohan, V. M. (1969). *Principles of physical education.* Delhi: Metropolitan Book Dep.

Nixon, E. E. & Cozen, F.W. (1969). *An introduction to physical education*. Philadelphia: W.B. Saunders Co.

Obertuffer, (1970). *Delbert physical education*. New York: Harper & Brothers Publisher.

Sharman, J. R. (1964). *Introduction to physical education*. New York: A.S. Barnes & Co.

William, J. F. (1964). *The principles of physical education*. Philadelphia: W.B. Saunders Co.

Semester I

Theory Courses

CC-102 ANATOMY AND PHYSIOLOGY

UNIT-I

- Brief Introduction of Anatomy and physiology in the field of Physical Education.
- Introduction of Cell and Tissue.
- The arrangement of the skeleton ï Function - of the skeleton ï Ribs and Vertebral column and the extremities ï joints of the body and their types
- Gender differences in the skeleton.
- Types of muscles.

UNIT-II

- **Blood and circulatory system:** Constituents of blood and their function ï Blood groups and blood transfusion, clotting of blood, the structure of the heart-properties of the heart muscle, circulation of blood, cardiac cycle, blood pressure, Lymph and Lymphatic circulation. Cardiac output.
- **The Respiratory system:** The Respiratory passage ï the lungs and their structure and exchange of gases in the lungs, mechanism of respiration (internal and external respiration) lung capacity, tidal volume.
- **The Digestive system:** structure and functions of the digestive system, Digestive organs, Metabolism,
- **The Excretory system:** Structure and functions of the kidneys and the skin.
- **The Endocrine glands:** Functions of glands pituitary, Thyroid, Parathyroid. Adrenal, Pancreatic and the sex glands.
- **Nervous systems:** Function of the Autonomic nervous system and Central nervous system. Reflex Action,
- **Sense organs:** A brief account of the structure and functions of the Eye and Ear.

UNIT-III

- Definition of physiology and its importance in the field of physical education and sports.
- Structure, Composition, Properties and functions of skeletal muscles.
- Nerve control of muscular activity:
  - Neuromuscular junction
  - Transmission of nerve impulse across it.
- Fuel for muscular activity
- Role of oxygen- physical training, oxygen debt, second wind, vital capacity.

UNIT-IV

- Effect of exercise and training on cardiovascular system.
- Effect of exercise and training on respiratory system.
- Effect of exercise and training on muscular system
- Physiological concept of physical fitness, warming up, conditioning and fatigue.
- Basic concept of balanced diet ï Diet before, during and after competition.

References:

Gupta, A. P. (2010). *Anatomy and physiology.* Agra: SumitPrakashan.

Gupta, M. and Gupta, M. C. (1980). *Body and anatomical science.* Delhi: Swaran Printing Press.

Guyton, A.C. (1996). Textbook of Medical Physiology, 9th edition. Philadelphia: W.B. Saunders.

Karpovich, P. V. (n.d.). *Philosophy of muscular activity.* London: W.B. Saunders Co.

Lamb, G. S. (1982). Essentials of exercise physiology. Delhi: Surjeet Publication.

Moorthy, A. M. (2014). *Anatomy physiology and health education.*Karaikudi: Madalayam Publications.

Morehouse, L. E. & Miller, J. (1967). *Physiology of exercise*. St. Louis: The C.V. Mosby Co.

Pearce, E. C. (1962). *Anatomy and physiology for nurses.* London: Faber & Faber Ltd.

Sharma, R. D. (1979). *Health and physical education,* Gupta Prakashan.

Singh, S. (1979). *Anatomy of physiology and health education*. Ropar: Jeet Publications.

Semester I

Theory courses

CC-103 HEALTH EDUCATION AND ENVIRONMENTAL STUDIES

Unit – I Health Education

- Concept, Dimensions, Spectrum and Determinants of Health
- Definition of Health, Health Education, Health Instruction, Health Supervision
- Aim, objective and Principles of Health Education
- Health Service and guidance instruction in personal hygiene

Unit – II Health Problems in India

- Communicable and Non Communicable Diseases
- Obesity, Malnutrition, Adulteration in food, Environmental sanitation, Explosive Population,
- Personal and Environmental Hygiene for schools
- Objective of school health service, Role of health education in schools
- Health Services ï Care of skin, Nails, Eye health service, Nutritional service, Health appraisal, Health record, Healthful school environment, first- aid and emergency care etc.

Unit – III Environmental Science

- Definition, Scope, Need and Importance of environmental studies.
- Concept of environmental education, Historical background of environmental education,
- Celebration of various days in relation with environment.
- Plastic recycling & probation of plastic bag / cover.
- Role of school in environmental conservation and sustainable development.

Unit – IVNatural Resources and related environmental issues:

- Water resources, food resources and Land resources
- Definition, effects and control measures of:
- Air Pollution, Water Pollution, Soil Pollution, Noise Pollution, Thermal Pollution
- Management of environment and Govt. policies , Role of pollution control board.

References:

Agrawal, K.C. (2001). *Environmental biology*.Bikaner: Nidhi publishers Ltd.

Frank, H. &Walter, H., (1976). *Turners school health education*. Saint Louis: The C.V. Mosby Company.

Nemir, A. (n.d.). The school health education. New York:Harber and Brothers.

Odum, E.P. (1971). *Fundamental of ecology*. U.S.A.: W.B. Saunders Co.

Semester – I

Theory courses

EC-101 OLYMPIC MOVEMENT (ELECTIVE)

Unit – I Origin of Olympic Movement

- Philosophy of Olympic movement
- The early history of the Olympic movement
- The significant stages in the development of the modern Olympic movement
- Educational and cultural values of Olympic movement

Unit – IIModern Olympic Games

- Significance of Olympic Ideals, Olympic Rings, Olympic Flag
- Olympic Protocol for member countries
- Olympic Code of Ethics
- Olympism in action
- Sports for All

Unit – III Different Olympic Games

- Para Olympic Games
- Summer Olympics
- Winter Olympics
- Youth Olympic Games

Unit – IV Committees of Olympic Games

- International Olympic Committee - Structure and Functions
- National Olympic committees and their role in Olympic movement
- Olympic commission and their functions
- Olympic medal winners of India

Reference:

Osborne, M. P. (2004). *Magictree house fact tracker: ancient greece and the olympics: a nonfiction companion to magic tree house: hour of the Olympics. New York:* Random House Books for Young Readers.

Burbank, J. M., Andranovich, G. D. &Heying Boulder, C. H. (2001). Olympic dreams: the impact of mega-events on local politics: Lynne Rienner

Semester – I

Theory courses

EC-102 OFFICIATING AND COACHING (Elective)

Unit- I: Introduction of Officiating and coaching

- Concept of officiating and coaching
- Importance and principles of officiating
- Relation of official and coach with management, players and spectators
- Measures of improving the standards of officiating and coaching

Unit- II: Coach as a Mentor

- Duties of coach in general, pre, during and post game.
- Philosophy of coaching
- Responsibilities of a coach on and off the field
- Psychology of competition and coaching

Unit- III: Duties of Official

- Duties of official in general, pre, during and post game.
- Philosophy of officiating
- Mechanics of officiating ï position, singles and movement etc.
- Ethics of officiating

Unit- IV: Qualities and Qualifications of Coach and Official

- Qualities and qualification of coach and official
- General rules of games and sports
- Eligibility rules of intercollegiate and inter-university tournaments, preparation of TA, DA bills
- Integrity and values of sports

Reference Books:

Bunn, J. W. (1968). *The art of officiating sports*. Englewood cliffs N.J. Prentice Hall.

Bunn, J. W. (1972). *Scientific principles of coaching.* Englewood cliffs N. J. Prentice Hall.

Dyson, G. H. (1963). *The mechanics of athletics*. London: University of London Press Ltd.

Dyson, G. H. (1963). *The mechanics of Athletics*. London: University of London Press Ltd.

Lawther, J.D. (1965). *Psychology of coaching.* New York: Pre. Hall.

Singer, R. N. (1972). *Coaching, athletic & psychology*.New York: M.C. Graw Hill.

Semester – II

Theory Courses

CC-201 YOGA EDUCATION

Unit – I: Introduction

- Meaning and Definition of Yoga
- Aims and Objectives of Yoga
- Yoga in Early Upanisads
- The Yoga Sutra: General Consideration
- Need and Importance of Yoga in Physical Education and Sports

Unit - II: Foundation of Yoga

- The Astanga Yoga: Yama, Niyama, Asana, Pranayama, Pratyahara, Dharana, Dhyana and Samadhi
- Yoga in the Bhagavadgita - Karma Yoga, Raja Yoga, Jnana Yoga and Bhakti Yoga

Unit - III Asanas

- Effect of Asanas and Pranayama on various system of the body
- Classification of asanas with special reference to physical education and sports
- Influences of relaxtive, meditative posture on various system of the body
- Types of Bandhas and mudras
- Type of kriyas

Unit – IVYoga Education

- Basic, applied and action research in Yoga
- Difference between yogic practices and physical exercises
- Yoga education centers in India and abroad
- Competitions in Yogasanas

References:

Brown, F. Y.(2000). *How to use yoga*. Delhi:Sports Publication.

Gharote, M. L. &Ganguly, H. (1988). *Teaching methods for yogic practices*.Lonawala: Kaixydahmoe.

Rajjan, S. M. (1985). *Yoga strenthening ofrelexation for sports man.* New Delhi:Allied Publishers.

Shankar,G.(1998). *Holistic approach of yoga.* New Delhi:Aditya Publishers.

Shekar,K. C. (2003). *Yoga for health*. Delhi: Khel Sahitya Kendra.

Semester – II

Theory Courses

CC-202 EDUCATIONAL TECHNOLOGY AND METHODS OF TEACHING N PHYSICAL EDUCATION

Unit – I Introduction

- Education and Education Technology- Meaning and Definitions
- Types of Education- Formal, Informal and Non- Formal education.
- Educative Process
- Importance of Devices and Methods of Teaching.

Unit ï II Teaching Technique

- Teaching Technique ï Lecture method, Command method, Demonstration method, Imitation method, project method etc.
- Teaching Procedure ï Whole method, whole ï part ï whole method, part ï whole method.
- Presentation Technique ï Personal and technical preparation
- Command- Meaning, Types and its uses in different situations.

Unit – III Teaching Aids

- Teaching Aids ï Meaning, Importance and its criteria for selecting teaching aids.
- Teaching aids ï Audio aids, Visual aids, Audio ï visual aids, Verbal, Chalk board, Charts, Model, Slide projector, Motion picture etc
- Team Teaching ï Meaning, Principles and advantage of team teaching.
- Difference between Teaching Methods and Teaching Aid.

Unit – IV Lesson Planning and Teaching Innovations

- Lesson Planning ï Meaning, Type and principles of lesson plan.
- General and specific lesson plan.
- Micro Teaching ï Meaning, Types and steps of micro teaching.
- Simulation Teaching - Meaning, Types and steps of simulation teaching.

Reference:

Bhardwaj, A. (2003). *New media of educational planning*.New Delhi:Sarup of Sons.

Bhatia,& Bhatia,(1959). *The principles and methods of teaching.*New Delhi: Doaba House.

Kochar, S.K. (1982). *Methods and techniques of teaching.*New Delhi: Sterling Publishers Pvt. Ltd.

Sampath, K.,Pannirselvam, A. &Santhanam, S. (1981). *Introduction to educational technology.*New Delhi: Sterling Publishers Pvt. Ltd.

Walia, J.S. (1999). *Principles and methods of education.*Jullandhar:Paul Publishers.

Semester – II

Theory Courses

CC-203 ORGANZATION AND ADMINISTRATION IN PHYSICAL EUCATION

Unit – I: Organization and administration

- Meaning and importance of Organization and Administration in physical education
- Qualification and Responsibilities of Physical Education teacher and pupil leader
- Planning and their basic principles,
- Program planning: Meaning, Importance, Principles of program planning in physical education.
- Functions of Planning, organizing, staffing, directing, communicating, co-ordination, controlling, evaluating and innovating.

Unit- II: Office Management, Record, Register & Budget

- Office Management: Meaning, definition, functions and kinds of office management
- Records and Registers: Maintenance of attendance Register, stock register, cash register, physical efficiency record, Medical examination Record.
- Budget: Meaning, Importance of Budget making,
- Criteria of a good Budget, Sources of Income, Expenditure, Preparation of Budget.

Unit-III: Facilities, & Time-Table Management

- Facilities and equipment management: Types of facilities Infrastructure-indoor, out door.
- Care of school building, Gymnasium, swimming pool, Play fields, Play grounds
- Equipment: Need, importance, purchase, care and maintenance.
- Time Table Management: Meaning, Need, Importance and Factor affecting time table.

Unit-IV:Competition Organization

- Importance of Tournament,
- Types of Tournament and its organization structure - Knock-out Tournaments, League or Round Robin Tournaments, Combination Tournament and challenge Tournament.
- Organization structure of Athletic Meet
- Sports Event Intramurals & Extramural Tournament planning

References:

Broyles, F. J. &Rober, H. D. (1979). *Administration of sports, Athletic programme: A Managerial Approach.* New York: Prentice hall Inc.

Bucher, C. A. (1983). *Administration of Physical Education and Athletic programme.*St. Lolis: The C.V. Hosby Co.

Kozman, H.C. Cassidly, R. & Jackson, C. (1960).*Methods in Physical Education*. London: W.B. Saunders Co.

Pandy, L.K. (1977). *Methods in Physical Education.*Delhe: Metropolitan Book Depo.

Sharma, V.M. & Tiwari, R.H.: (1979). *Teaching Methods in Physical Education.* Amaravati: Shakti Publication.

Thomas, J. P.(1967). *Organization & administration of Physical Education*. Madras: Gyanodayal Press.

Tirunarayanan, C. &Hariharan, S. (1969). *Methods in Physical Education.*Karaikudi: South India Press.

Voltmer, E. F. &Esslinger, A. A. (1979).*The organization and administration of Physical Education.* New York: Prentice Hall Inc.

Semester – II

Theory Courses

EC-201 CONTEMPORARY ISSUES IN PHYSICAL EDUCATION, FITNESS AND WELLNESS (ELECTIVE)

Unit – I Concept of Physical Education and Fitness

- Definition, Aims and Objectives of Physical Education, fitness and Wellness
- Importance and Scope of fitness and wellness
- Modern concept of Physical fitness and Wellness
- Physical Education and its Relevance in Inter Disciplinary Context.

Unit – II Fitness, Wellness and Lifestyle

- Fitness ï Types of Fitness and Components of Fitness
- Understanding of Wellness
- Modern Lifestyle and Hypo kinetic Diseases ï Prevention and Management
- Physical Activity and Health Benefits

Unit – III Principles of Exercise Program

- Means of Fitness development ï aerobic and anaerobic exercises
- Exercises and Heart rate Zones for various aerobic exercise intensities
- Concept of free weight Vs Machine, Sets and Repetition etc
- Concept of designing different fitness training program for different age group.

Unit – IV Safety Education and Fitness Promotion

- Health and Safety in Daily Life
- First Aid and Emergency Care
- Common Injuries and their Management
- Modern Life Style and Hypo-kinetic Disease ï Prevention and Management

References:

Difiore, J.(1998). *Complete guide to postnatal fitness.* London: A & C Black,.

Giam, C.K & The, K.C. (1994). *Sport medicine exercise and fitness.* Singapore: P.G. Medical Book.

Mcglynn, G., (1993). *Dynamics of fitness*. Madison: W.C.B Brown.

Sharkey, B. J.(1990). *Physiology of fitness,* Human Kinetics Book.

Semester II

Theory courses

EC-202 SPORTS NUTRITION AND WEIGHT MANAGEMENT (ELECTIVE)

Unit – I Introduction to Sports Nutrition

- Meaning and Definition of Sports Nutrition
- Basic Nutrition guidelines
- Role of nutrition in sports
- Factor to consider for developing nutrition plan

Unit – II Nutrients: Ingestion to energy metabolism

- Carbohydrates, Protein, Fat ï Meaning, classification and its function
- Role of carbohydrates, Fat and protein during exercise
- Vitamins, Minerals, Water ï Meaning, classification and its function
- Role of hydration during exercise, water balance, Nutrition ï daily caloric requirement and expenditure.

Unit – III Nutrition and Weight Management

- Meaning of weight management Concept of weight management in modern era Factor affecting weight management and values of weight management
- Concept of BMI (Body mass index), Obesity and its hazard, Myth of Spot reduction, Dieting versus exercise for weight control, Common Myths about Weight Loss
- Obesity ï Definition, meaning and types of obesity,
- Health Risks Associated with Obesity, Obesity - Causes and Solutions for Overcoming Obesity.

Unit – IV Steps of planning of Weight Management

- Nutrition ï Daily calorie intake and expenditure, Determination of desirable body weight
- Balanced diet for Indian School Children, Maintaining a Healthy Lifestyle
- Weight management program for sporty child, Role of diet and exercise in weight management, Design diet plan and exercise schedule for weight gain and loss

References:

Bessesen, D. H. (2008). Update on obesity. *J ClinEndocrinolMetab.93*(6), 2027-2034.

Butryn, M.L., Phelan, S., &Hill, J. O.(2007). Consistent self-monitoring of weight: a key component of successful weight loss maintenance.*Obesity(Silver Spring)*. *15*(12), 3091-3096.

Chu, S.Y. & Kim, L. J. (2007). Maternal obesity and risk of stillbirth: a metaanalysis. *Am J ObstetGynecol*, *197*(3), 223-228.

DeMaria, E. J. (*2007).* Bariatric surgery for morbid obesity. *N Engl J Med,356*(21), 2176-2183.

Dixon, J.B., O'Brien, P.E., Playfair, J. (n.d.). Adjustable gastric banding and conventional therapy for type 2 diabetes: a randomized controlled trial. *JAMA. 299*(3), 316-323.

Semester – III

Theory Courses

CC-301 SPORTS TRAINING

Unit – I Introduction to Sports Training

- Meaning and Definition of Sports Training
- Aim and Objective of Sports Training
- Principles of Sports Training
- System of Sports Training ï Basic Performance, Good Performance and High Performance Training

Unit – II Training Components

- Strength ï Mean and Methods of Strength Development
- Speed ï Mean and Methods of Speed Development
- Endurance - Mean and Methods of Endurance Development
- Coordination ï Mean and Methods of coordination Development
- Flexibility ï Mean and Methods of Flexibility Development

Unit – III Training Process

- Training Load- Definition and Types of Training Load
- Principles of Intensity and Volume of stimulus
- Technical Training ï Meaning and Methods of Technique Training
- Tactical Training ï Meaning and Methods of Tactical Training

Unit – IV Training programming and planning

- Periodization ï Meaning and types of Periodization
- Aim and Content of Periods ï Preparatory, Competition, Transitional etc.
- Planning ï Training session
- Talent Identification and Development

Reference:

Dick, W. F. (1980).*Sports training principles.*London: Lepus Books.

Harre, D.(1982).*Principles of sports training.*Berlin: Sporulated.

Jensen, R. C.& Fisher, A.G. (1979). *Scientific basis of athletic conditioning*. Philadelphia: Lea and Fibiger, 2nd Edn.

Matvyew, L.P. (1981).*Fundamental of sports training.* Moscow: Progress Publishers.

Singh, H. (1984).*Sports training, general theory and methods*.Patials: NSNIS.

Uppal, A.K., (1999).*Sports Training.*New Delhi: Friends Publication.

Semester III

Theory Courses

CC-302 COMPUTER APPLICATIONS IN PHYSICAL EDUCATION

Unit – I: Introduction to Computer

- Meaning, need and importance of information and communication technology (ICT). Application of Computers in Physical Education
- Components of computer, input and output device
- Application software used in Physical Education and sports

Unit – II: MS Word

- Introduction to MS Word
- Creating, saving and opening a document
- Formatting Editing features Drawing table ,
- page setup, paragraph alignment, spelling and grammar check printing option, inserting page number, graph, footnote and notes

Unit – III: MS Excel

- Introduction to MS Excel
- Creating, saving and opening spreadsheet
- creating formulas
- Format and editing features adjusting columns width and row height understanding charts.

Unit – IV: MS Power Point

- Introduction to MS Power Point
- Creating, saving and opening a ppt. file
- format and editing features slide show , design , inserting slide number
- picture ,graph ,table
- Preparation of Power point presentations

Referances:

Irtegov, D. (2004). *Operating system fundamentals*. Firewall Media.
Marilyn, M.& Roberta, B.(n.d.).*Computers in your future*. 2nd edition, India: Prentice Hall.
Milke, M.(2007). *Absolute beginner's guide to computer basics*. Pearson Education Asia.
Sinha, P. K. & Sinha, P. (n.d.).*Computer fundamentals*. 4th edition, BPB Publication.

Semester – III

Theory Courses

CC-303 SPORTS PSYCHOLOGY AND SOCIOLOGY

Unit -I: introduction

- Meaning, Importance and scope of Educational and Sports Psychology
- General characteristics of Various Stages of growth and development
- Types and nature of individual differences; Factors responsible -Heredity And environment
- Psycho-sociological aspects of Human behavior in relation to physical education and sports

Unit-II: Sports Psychology

- Nature of learning, theories of learning, Laws of learning,
- Plateau in Learning; & transfer of training
- Meaning and definition of personality, characteristics of personality,
- Dimension of personality, Personality and Sports performance
- Nature of motivation: Factors influencing motivation; Motivation and techniques and its impact on sports performance.
- Mental Preparation Strategies: Attention focus, Self- talk, Relaxation, Imaginary.
- Aggression and Sports, Meaning and nature of anxiety, Kinds of anxiety
- Meaning and nature of stress; Types of stress, Anxiety, Stress, Arousal and their effects on sports performance

Unit-III: Relation between Social Science and Physical Education.

- Orthodoxy, customs, Tradition and Physical Education.
- Festivals and Physical Education.
- Socialization through Physical Education.
- Social Group life, Social conglomeration and Social group, Primary group and Remote group.

Unit-4 Culture : Meaning and Importance.

- Features of culture,
- Importance of culture.
- Effects of culture on people life style.
- Different methods of studying Observation/ Inspection method, Questionnaire method, Interview method

References:

Ball, D. W. & Loy, J. W. (1975).*Sport and social order; Contribution to the sociology of sport.*London: Addison Wesley Publishing Co., Inc.

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Semester – III

Theory Courses

EC-301 SPORTS MEDICINE, PHYSIOTHERAPY AND REHANLITATION (ELECTIVE)

Unit-I: - Sports Medicine:

- Sports Medicine: Meaning, Definition, Aims, Objectives, Modern Concepts and Importance.
- Athletes Care and Rehabilitation: Contribution of Physical Education Teachers and Coaches.
- Need and Importance of the study of sports injuries in the field of Physical Education
- Prevention of injuries in sports ï Common sports injuries ï Diagnosis ï
- First Aid - Treatment - Laceration ï Blisters ï Contusion - Strain ï Sprain ï Fracture ï Dislocation and Cramps ï Bandages ï Types of Bandages ï trapping and supports.

Unit-II: Physiotherapy

- Definition ï Guiding principles of physiotherapy, Importance of physiotherapy, Introduction and demonstration of treatments - Electrotherapy ï infrared rays ï Ultraviolet rays ï short wave diathermy ï ultrasonic rays.

Unit-III: Hydrotherapy:

- Introduction and demonstration of treatments of Cry therapy, Thermo therapy, Contrast Bath, Whirlpool Bath ï Steam Bath ï Sauna Bath ï Hot Water Fomentation ï Massage: History of Massage ï Classification of Manipulation (Swedish System) physiological Effect of Massage.

Unit-IV: Therapeutic Exercise:

- Definition and Scope ï Principles of Therapeutic Exercise ï Classification, Effects and uses of Therapeutic exercise ï passive Movements (Relaxed, Forced and passive - stretching) ï active movements (concentric, Eccentric and static) application of the therapeutic exercise: Free Mobility Exercise ï Shoulder, Elbow ï Wrist and Finger Joints ï Hips, Knee, ankle and Foot joints ï Trunk. Head and Neck exercises.

References:

Christine, M. D., (1999). *Physiology of sports and exercise*.USA: Human Kinetics.

Conley, M. (2000). *Bioenergetics of exercise training*. In T.R. Baechle, & R.W. Earle, (Eds.), Essentials of Strength Training and Conditioning (pp. 73-90). Champaign, IL: Human Kinetics.

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Jeyaprakash, C. S., Sports Medicine, J.P. Brothers Pub., New Delhi, 2003.
Khanna, G.L., (1990). *Exercise physiology & sports medicine*. Delhi:Lucky Enterprises.
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Williams, J. G. P. (1962). *Sports medicine*. London: Edward Arnold Ltd.

Semester – III

Theory Courses

EC-302 CURRICULUM DESIGN (Elective)

UNIT-I Modern concept of the curriculum

- Need and importance of curriculum, Need and importance of curriculum development, the role of the teacher in curriculum development.
- Factors affecting curriculum - Social factors - Personnel qualifications - Climatic consideration - Equipment and facilities -Time suitability of hours.
- National and Professional policies, Research finding

UNIT-IIBasic Guide line for curriculum construction; contest (selection and expansion).

- Focalization
- Socialization
- Individualization
- Sequence and operation
- Steps in curriculum construction.

UNIT-IIICurriculum-Old and new concepts, Mechanics of curriculum planning.

- Basic principles of curriculum construction.
- Curriculum Design, Meaning, Importance and factors affecting curriculum design.
- Principles of Curriculum design according to the needs of the students and state and national level policies.
- Role of Teachers

UNIT-IV Under-graduate preparation of professional preparation.

- Areas of Health education, Physical education and Recreation.
- Curriculum design-Experience of Education, Field and Laboratory.
- Teaching practice.
- Professional Competencies to be developed-Facilities and special resources for library, laboratory and other facilities.

Reference:

Barrow, H. M. (1983). *Man and movement: principles of physical education*. Philadelphia: Lea and Febiger.

Bucher, C. A. (1986). Foundation of physical education: St. Louis: The C. V. Mosby & Company.

Cassidy, R. (1986). *Curriculum development in physical education*. New York: Harper & Company.

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Underwood, G. L. (1983). *The physical education curriculum in secondary school: planning and implementation.*England: Taylor and Francis Ltd.

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Semester – IV

Theory Courses

CC-401 MEASUREMENT AND EVALUATION IN PHYSICAL EDUCATION

Unit- IIntroduction to Test & Measurement & Evaluation

- Meaning of Test & Measurement & Evaluation in Physical Education
- Need & Importance of Test & Measurement & Evaluation in Physical Education
- Principles of Evaluation

Unit- IICriteria; ClassificationandAdministration of test

- Criteria of good Test
- Criteria of tests, scientific authenticity (reliability, objectivity, validity and availability of norms)
- Type and classification of Test
- Administration of test, advance preparation ï Duties during testing ï Duties after testing.

Unit- III Physical Fitness Tests

- AAHPER youth fitness test
- National physical Fitness Test
- Indiana Motor Fitness Test
- JCR test
- U.S Army Physical Fitness Test

Unit- IV Sports Skill Tests

- Lockhart and McPherson badminton test
- Johnson basketball test
- McDonald soccer test
- S.A.I volleyball test
- S.A.I Hockey test

References:

Bangsbo, J. (1994). *Fitness training in football: A scientific approach*. Bagsvaerd, Denmark: Ho+Storm.

Barron, H. M., &Mchee, R. (1997). *A practical approach to measurement in physical education*. Philadelphia: Lea and Febiger.

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Kansal, D.K. (1996). *Test and measurement in sports and physical education*. New Delhi: D.V.S. Publications.

Mathews, D.K., (1973). *Measurement in physical education*, Philadelphia: W.B.SoundersCompnay.

Pheasant, S. (1996). *Body space: anthropometry, ergonomics and design of work*. Taylor & Francis, New York.

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Sodhi, H.S., & Sidhu, L.S. (1984). *Physique and selection of sports- a kinanthropometric study*. Patiala: Punjab Publishing House.

Semester – IV
Theory Courses

CC-402 KINESIOLOGY AND BIOMECHANICS

Unit – I Introduction to Kinesiology and Sports Biomechanics

- Meaning and Definition of Kinesiology and Sports Biomechanics
- Importance of Kinesiology and Sports Biomechanics to Physical Education Teacher, Athletes and Sports Coaches.
- Terminology of Fundamental Movements
- Fundamental concepts of following terms ï Axes and Planes, Centre of Gravity, Equilibrium, Line of Gravity

Unit – II Fundamental Concept of Anatomy and Physiology

- Classification of Joints and Muscles
- Types of Muscle Contractions
- Posture ï Meaning, Types and Importance of good posture.
- Fundamental concepts of following terms- Angle of Pull, All or None Law, Reciprocal Innovation

Unit – III Mechanical Concepts

- Force - Meaning, definition, types and its application to sports activities
- Lever - Meaning, definition, types and its application to human body.
- Newtonôs Laws of Motion ï Meaning, definition and its application to sports activities.
- Projectile ï Factors influencing projectile trajectory.

Unit – IV Kinematics and Kinetics of Human Movement

- Linear Kinematics ï Distance and Displacement, speed and velocity, Acceleration
- Angular kinematics ï Angular Distance and Displacement, Angular Speed and velocity, Angular Acceleration.
- Linear Kinetics ï Inertia, Mass, Momentum, Friction.
- Angular Kinetics ï Moment of inertia ,Couple, Stability.

Reference:

Bunn, J. W. (1972).*Scientific principles of coaching.* Englewood Cliffs, N.J.: Prentice Hall Inc.

Hay, J. G. & Reid, J. G.(1982).*The anatomical and mechanical basis of human motion.* Englewood Cliffs, N.J.: prentice Hall Inc.

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Simonian, C.(1911).*Fundamentalsof sport biomechanics.* Englewood Cliffs, N.J.: Prentice Hall Inc.

Semester – IV
Theory Courses
CC-403 RESEARCH AND STATISTICS IN PHYSICAL EDUCATION

Unit-I Introduction to Research

- Definition of Research
- Need and importance of Research in Physical Education and Sports.
- Scope of Research in Physical Education & Sports.
- Classification of Research
- Research Problem, Meaning of the term, Location and criteria of Selection of Problem, Formulation of a Research Problem, Limitations and Delimitations.

Unit-II Survey of Related Literature

- Need for surveying related literature.
- Literature Sources, Library Reading
- Research Proposal, Meaning and Significance of Research Proposal.
- Preparation of Research proposal / project.
- Research Report: A group project is to be undertaken by a small batch of students under the supervision of a teacher, wherein it is expected to survey school facilities of physical education, health assessment programme evaluation, fitness status of the students, staff and other stakeholders etc. and submit the report to the institution.

Unit-III Basics of Statistical Analysis

- Statistics: Meaning, Definition, Nature and Importance
- Class Intervals: Raw Score, Continuous and Discrete Series, Class Distribution, Construction of Tables
- Graphical Presentation of Class Distribution: Histogram, Frequency Polygon, Frequency Curve. Cumulative Frequency Polygon, Ogive, Pie Diagram

Unit- IVStatistical Models in Physical Education and Sports

- Measures of Central Tendency: Mean, Median and Mode-Meaning, Definition, Importance, Advantages, Disadvantages and Calculation from Group and Ungrouped data
- Measures of Variability: Meaning, importance, computing from group and ungroup data
- Percentiles and Quartiles: Meaning, importance, computing from group and ungroup data

References:

Best, J.W. (1963). *Research in education*. U.S.A.: Prentice Hall.

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Uppal, A. K. (1990). *Physical fitness: how to develop.* New Delhi: Friends Publication.

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Semester – IV
Theory Courses

EC-401 THEORY OF SPORTS AND GAMES (ELECTIVE)

UNIT-IINTRODUCTION

General Introduction of speciliazed games and sports–

- Athletics,
- Badminton,
- Basketball,
- Cricket,
- Football,
- Gymnastic,
- Hockey,
- Handball,
- Kabaddi,
- Kho-Kho,
- Tennis,
- Volleyball and
- Yoga.

Each game or sports to be dealt under the following heads

- History and development of the Game and Sports
- Ground preparation, dimensions and marking
- Standard equipment and their specifications
- Ethics of sports and sportsmanship

UNIT-II Scientific Principles of coaching: (particular sports and game specific)

- Motion ï Types of motion and Displacement, Speed, Velocity, Acceleration, Distance and Newtonôs Law of motions.
- Force ï Friction, Centripetal and Centrifugal force, Principles of force.
- Equilibrium and its types
- Lever and its types
- Sports Training ï Aims, Principles and characteristics.
- Training load ï Components, Principles of load, Over Load (causes and symptoms).

UNIT-III Physical fitness components: (particular sports and game specific)

- Speed and its types
- Strength and its types
- Endurance and its types
- Flexibility and its types
- Coordinative ability and its types

- Training methods: - Development of components of physical fitness and motor fitness through following training methods (continuous method, interval method, circuit method, fartlek /speed play and weight training)

UNIT-IV Conditioning exercises and warming up.

- Concept of Conditioning and warming up.
- Role of weight training in games and sports.
- Teaching of fundamental skill & their mastery (technique, tactic and different phases of skill acquisition).
- Recreational and Lead up games
- Strategy ï Offence and defense, Principles of offence and defense.

References:

Bunn, J. W. (1968). *The art of officiating sports*. Englewood cliffs N.J. Prentice Hall.

Bunn, J. W. (1972). *Scientific principles of coaching.* Englewood cliffs N. J. Prentice Hall.

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Semester – IV

Theory Courses

EC-402 SPORTS MANAGEMENT

Unit-I

- Nature and Concept of Sports Management.
- Progressive concept of Sports management.
- The purpose and scope of Sports Management.
- Essential skills of Sports Management.
- Qualities and competencies required for the Sports Manager.
- Event Management in physical education and sports.

Unit-II

- Meaning and Definition of leadership
- Leadership style and method.
- Elements of leadership.
- Forms of Leadership.
    - Autocratic
    - Laissez-faire
    - Democratic
    - Benevolent Dictator
- Qualities of administrative leader.
- Preparation of administrative leader.
- Leadership and Organizational performance.

Unit-III

- Sports Management in Schools, colleges and Universities.
- Factors affecting planning
- Planning a school or college sports programme.
- Directing of school or college sports programme.
- Controlling a school, college and university sports programme.
    - Developing performance standard
    - Establishing a reporting system
    - Evaluation
    - The reward/punishment system

Unit-IV

- Financial management in Physical Education & sports in schools, Colleges and Universities.
- Budget ï Importance, Criteria of good budget,
- Steps of Budget making
- Principles of budgeting

REFERENCES:

Ashton, D. (1968).*Administration of physical education for women*.New York: The Ronal Press Cl.

Bucher, C.A. *Administration of physical education and athletic programme.* 7th Edition, St. Louis: The C.V. Mosby Co.

Daughtrey, G. & Woods, J.B. (1976). *Physical education and intramural programmes, organisation and administration.* Philadelphia U.S.A. : W.B. Sounders Cp.

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Part – B
Practical Courses
Semester – I

PC - 101
Track and Field:

Running Event

- Starting techniques: Standing start, Crouch start and its variations, Proper use of blocks.
- Finishing Techniques: Run, Through, Forward lunging, Shoulder Shrug
- Ground Marking, Rules and Officiating
- Hurdles:
    - Fundamental Skills- Starting, Clearance and Landing Techniques.
    - Types of Hurdles
    - Ground Marking and Officiating.

Relays: Fundamental Skills

- Various patterns of Baton Exchange
- Understanding of Relay Zones
- Ground Marking
- Interpretation of Rules and Officiating.

PC 102

Gymnastics: Floor Exercise

- Forward Roll, Backward Roll, Sideward Roll, different kinds of scales, Leg Split, Bridge, Dancing steps, Head stand, Jumps-leap, scissors leap.
- Vaulting Horse
- Approach Run, Take off from the beat board, Cat Vault, Squat Vault.

PC – 102

Swimming: Fundamental Skills

- Entry into the pool.
- Developing water balance and confidence
- Water fear removing drills.
- Floating-Mushroom and Jelly fish etc.
- Gliding with and without kickboard.
- Introduction of various strokes
- Body Position, Leg, Kick, Arm pull, Breathing and Co ordination.
- Start and turns of the concerned strokes.
- Introduction of Various Strokes.
- Water Treading and Simple Jumping.

- Starts and turns of concerned strokes.
- Rules of Competitive swimming-officials and their duties, pool specifications, seeding heats and finals, Rules of the races.

PC – 102

Shooting Fundamental Skills

- Basic stance, grip, Holding rifle/ Pistol, aiming target
- Safety issues related to rifle shooting
- Rules and their interpretations and duties of officials

(Any one out of three)

PC – 103 Indigenous sports:

Kabaddi: Fundamental Skills

- Skills in Raiding-Touching with hand, various kicks, crossing of baulk line, Crossing of Bonus line, luring the opponent to catch, Pursuing.
- Skills of Holding the Raider-Various formations, Catching from particular position, Different catches, Luring the raider to take particular position so as to facilitate catching, catching formations and techniques.
- Additional skills in raiding-Bringing the antis in to particular position, Escaping from various holds, Techniques of escaping from chain formation, Combined formations in offence and defense.
- Ground Marking, Rules and Officiating

PC – 103

Malkhambh and Light Apparatus:

- Lathi-Two counts exercises, Four Count exercises, eight count exercises, sixteen count exercises.
- GhatiLezuim-AathAawaaz, Bethakawaaz, AagePaon, Aagekadam, Do pherawaaz, Chau pherawaaz, Kadamtaal, Pavitra, Uchhakpavitra, Kadampavitra.
- Mass P.T. Exercises-Two count, four count and eight count exercises.
- Hindustani Lezuim-Char Awaaz, EkJagah, AantiLagaav, Pavitra, Do Rukh, Chau Rukh, Chau rukhbethak, Momiya.
- Drill and Marching
- Malkhamb-Salaami, Hold, Saadiudi, Bagaludi, Dashrangudi, Bagliudi, Veludi, Soydoro, Phirki, Padmasana, T.Balance, Pataka, Landing.
- Rope Malkhamb-Salaami, PadmasanaChadh, Katibandh1-2, Sadiadhi, Rikebpakkad, Rikebpagniadhi, Kamaradhi, Nakkikasadhi, Kamaradhi, Nakkikasadhi, Urubandhtedhi, Sadibagli, Do hatibagli, Kamarbandhbagli, nakkikasbagli, Dashrang, Hanuman pakad, Gurupakkad, various padmasana, Landing.

PC - 104

Kho Kho:

- General skills of the game-Running, chasing, Dodging, Faking etc.
- Skills in chasing-Correct Kho, Moving on the lanes, Pursuing the runner, Tapping the inactive runner, Tapping the runner on heels, Tapping on the pole, Diving, Judgement in giving Kho, Rectification of Foul.
- Skills in Running-Zig zag running, Single and double chain, Ring play, Rolling in the sides, Dodging while facing and on the back, fakes on the pole, fake legs, body arm etc, Combination of different skills.
- Ground Marking
- Rules and their interpretations and duties of officials.

PC – 104

Dumbells/ Wands/ Hoop/ Umbrella/ Tipri: Fundamentals skills

- Apparatus/ Light apparatus Grip
- Attention with apparatus/ Light apparatus
- Stand ï at ï ease with apparatus/ ligfht apparatus
- Exrcise with verbal command,drum, whistle and music ï Two count, Four count, Eight count and Sixteen count.
- Standing Exercise
- Jumping Exercise
- Moving Exercise
- Combination of above all

Semester – II

PC – 201

Track and Field

Athletics: Jumping Events

- High Jump (Straddle Roll)
- Approach Run,
- Take off
- Clearance over the bar.
- Landing

PC – 202

Gymnastics:

- Parallel Bar:
- Mount from one bar
- Straddle walking on parallel bars.
- Single and double step walk
- Perfect swing
- Shoulder stand on one bar and roll forward.
- Roll side
- Shoulder stand
- Front on back vault to the side(dismount)
- Horizontal /Single Bar:
- Grip
- Swings
- Fundamental Elements
- Dismount
- Uneven Parallal Bar:
- Grip
- Swings
- Fundamental Elements
- Dismount

PC – 202

Yoga:

- Surya Namaskara,
- Pranayams
- Corrective Asanas
- Kriyas
- Asanas
  - Sitting
  - Standing
  - Laying Prone Position,
  - Laying Spine Position

PC – 202

Swimming:

Introduction of water polo game

- Fundamental skills
- Swimm with the ball
- Passing
- Catching
- Shooting
- Goal keeping
- Rules of the games and responsibility of officials

Introduction of Diving sports.

- Basic Diving Skills from spring boards
- Basic Diving Skills from platform

PC – 202

Aerobics: Introduction of Aerobics

- Rhythmic Aerobics - dance
- Low impact aerobics
- High impact aerobics
- Aerobics kick boxing
- Postures ï Warm up and cool down
- THR Zone ï Being successful in exercise and adaptation to aerobic workout.

PC - 203

Badminton: Fundamental Skills

- Racket parts, Racket grips, Shuttle Grips.
- The basic stances.
- The basic strokes-Serves, Forehand-overhead and underarm, Backhand-overhead and underarm
- Drills and lead up games
- Types of games-Singles, doubles, including mixed doubles.
- Rules and their interpretations and duties of officials.

PC - 203

Table Tennis: Fundamental Skills

- The Grip-The Tennis Grip, Pen Holder Grip.
- Service-Forehand, Backhand, Side Spin, High Toss.
- Strokes-Push, Chop, Drive, Half Volley, Smash, Drop-shot, Balloon, Flick Shit, Loop Drive.
- Stance and Ready position and foot work.
- Rules and their interpretations and duties of officials.

PC – 203

Squash Fundamental Skills

- Service- Under hand and Over hand
- Service Reception
- Shot- Down the line, Cross Court
- Drop
- Half Volley
- Tactics ï Defensive, attacking in game
- Rules and their interpretations and duties of officials.

PC – 203

Tennis: Fundamental Skills**.**

- Grips- Eastern Forehand grip and Backhand grip, Western grip, Continental grip, Chopper grip.
- Stance and Footwork.
- Basic Ground strokes-Forehand drive, Backhand drive.
- Basic service.
- Basic Volley.
- Over-head Volley.
- Chop
- Tactics ï Defensive, attacking in game
- Rules and their interpretations and duties of officials.

Semester – III

PC – 301

Track and fields (Throwing Events)

- Discus Throw, Javelin, Hemmer throw, shot-put
- Basic Skills and techniques of the Throwing events
- Ground Marking / Sector Marking
- Interpretation of Rules and Officiating.
- Grip
- Stance
- Release
- Reserve/ (Follow through action)
- Rules and their interpretations and duties of officials

PC – 302

Boxing: Fundamental Skills

- Player stance
- Stance - Right hand stance, left hand stance.
- Footwork ï Attack, defense.
- Punches ï Jab, cross, hook, upper cut, combinations.
- Defense slip ï bob and weave, parry/block, cover up, clinch, counter attack
- Tactics ï Toe to toe, counter attack, fighting in close, feinting
- Rules and their interpretations and duties of officials.

PC – 302

Martial Arts/Karate: Fundamental Skills

- Player Stances ï walking, hand positions, front-leaning, side-fighting.
- Hand Techniques - Punches (form of a punch, straight punch, and reverse punch), Blocks (eight basic).
- Leg Techniques - Snap kicks, stretching straight leg, thrust kicks, sidekicks, round house.
- Forms - The first cause Katas.
- Self Defense - against punches, grabs and strikes, against basic weapons (knife, club sticks).
- Sparring - One step for middle punch, high punch and groin punch. (Defended by appropriate block from eight basic blocks).
- Rules and their interpretations and duties of officials.

PC – 302

Taekwondo Fundamental Skills

- Player Stances ï walking, extending walking, L stance, cat stance.
- Fundamental Skills ï Sitting stance punch, single punch, double punch, triple punch.
- Punching Skill from sparring position ï front-fist punch, rear fist punch, double punch, and four combination punch.
- Foot Tenchniques (Balgisul) ï standing kick (soseochagi), Front kick (AP chagi), Arc kick (BandalChagi), Side kick, (YeopChagi), Turning kick (DollyoChagi), Back kick (Twit Chagi), Reverse turning kick (BandaeDollyoChagi), Jump kick (TwimyoChagi),
- Poomsae (Forms) ï Jang, Yi Jang, Sam Jang, Sa Jang, O Jang, Yook Jang, Chil Jang, Pal Jang (Fundamental Movement ï eye control, concentration of spirit, speed control, strength control, flexibility, balance, variety in techniques)
- Sparring (Kyorugi) ï One Step Sparring (hand techniques, foot techniques, self defense techniques, combination kicks), Free Sparring.
- Board Breaking (Kyokpa) ï eye control, balance, power control, speed, point of attack.
- Rules and their interpretations and duties of officials.

PC – 302

Judo: Fundamental skills

- Rei (Salutation)-Ritsurei(Salutation in standing position), Zarai (Salutation in the sitting position)
- Kumi kata (Methods of holding judo costume)
- Shisei (Posture in Judo)
- Kuzushi (Act of disturbing the opponent posture)
- Tsukuri and kake (Preparatory action for attack)
- Ukemi (Break Fall)-UrhiroUkemi (Rear break Fall), Yoko Ukemi (Side Break Fall), Mae Ukemi (Front Break Fall), Mae mawariUkemi (Front Rolling break fall)
- Shin Tai (Advance or retreat foot movement)-Suri-ashi (Gliding foot), Twugi-ashi (Following footsteps), Ayumi-ashi (Waling steps.
- Tai Sabaki (Management of the body)
- NageWaze (Throwing techniques)-HizaGuruma (Knee wheel), SesaeTwurikomi-ashi (Drawing ankle throw), De ashihari (Advance foot sweep), O Goshi (Major loinm), SeoiNage (Shoulder throw).
- Katamawaze(Grappling techniques)-Kesagatame (Scaff hold), Kata gatame (Shoulder hold), Kami shihogatama (Locking of upper four quarters), Method of escaping from each hold.

PC – 302

Wrestling: Fundamental Skills

- Take downs, Leg tackles, Arm drag.
- Counters for take downs, Cross face, Whizzer series.
- Escapes from under-sit-out turn in tripped.
- Counters for escapes from under-Basic control back drop, Counters for stand up.
- Pinning combination-Nelson series(Half Nelson, Half Nelson and Bar arm), Leg lift series, Leg cradle series, Reverse double bar arm, chicken wing and half Nelson.
- Escapes from pining: Wing lock series, Dopuble arm lock roll, Cridge.
- Standing Wrestling-Head under arm series, whizzer series
- Referees positions.

PC – 302

Fencing: Fundamental Skill

- Basic Stance - on-guard position (feet and legs)
- Footwork ï advance, retire, lunge, Step-lunge
- Grip ï hold a foil correctly, Etiquette ï salute and handshake to coaches and partners
- Hit a target (glove, mask, person) at riposte distance
- Lunge from an on-guard position.
- Attack - simple attacks from sixte ï direct, disengage, doublé attack, compound attacks high line ï one-two and cut-over disengage, Cut-over attack, Low line attacks
- Semi circular parries ï octave and septime
- Understand the layout of a piste.
- Compound or successive parries.
- Lateral parry and direct riposte
- Fence a bout ï judges etc. salutes and handshakes
- Rules and their interpretations and duties of officials.

PC 303 Team Games

PC 303

Base Ball Fundamental Skills

- Player Stances ï walking, extending walking, L stance, cat stance.
- Grip ï standard grip, choke grip,
- Batting ï swing and bunt.
- Pitching ï

- Baseball : slider, fast pitch, curve ball, drop ball, rise ball, change up, knuckle ball, screw ball,
- Softball: windmill, sling shot,
- starting position: wind up, set.
- Fielding ï
    - Catching: basics to catch fly hits, rolling hits,
    - Throwing: over arm, side arm.

- Base running ï
    - Base running: single, double, triple, home run,
    - Sliding: bent leg slide, hook slide, head first slide.

- Rules and their interpretations and duties of officials.

PC 303

Netball: Fundamental Skills

- Catching: one handed, two handed, with feet grounded, in flight.
- Throwing (different passes and their uses): one handed passes (shoulder, high shoulder, underarm, bounce, lob); two handed passes (push, overhead, bounce).
- Footwork: landing on one foot; landing on two feet; pivot; running pass.
- Shooting: one hand; two hands; forward step shot; backward step shot.
- Techniques of getting free: dodge and sprint; sudden sprint; sprint and stop; sprinting with change of speed.
- Defending: marking the player; marking the ball; blocking; inside the circle; outside the circle (that is, defending the circle edge against the pass in).
- Intercepting: pass; shot.
- The toss-up.
- Role of individual players
- Rules and their interpretations and duties of officials.

PC – 303

Cricket: Fundamental Skills

- Batting-Forward and backward defensive stroke
- Bowling-Simple bowling techniques
- Fielding-Defensive and offensive fielding
- Catching-High catching and Slip catching
- Stopping and throwing techniques
- Wicket keeping techniques

PC 303

Football: Fundamental Skills

- Kicks-Inside kick, Instep kick, Outer instep kick, lofted kick
- Trapping-trapping rolling the ball, trapping bouncing ball with sole
- Dribbling-With instep, inside and outer instep of the foot.
- Heading-From standing, running and jumping.
- Throw in
- Feinting-With the lower limb and upper part of the body.
- Tackling-Simple tackling, Slide tackling.
- Goal Keeping-Collection of balls, Ball clearance-kicking, throwing and deflecting.

PC 303

Hockey: Fundamental Skills

- Player stance & Grip
- Rolling the ball
- Dribbling
- Push
- Stopping
- Hit
- Flick
- Scoop
- Passing ï Forward pass, square pass, triangular pass, diagonal pass, return pass,
- Reverse hit
- Dodging
- Goal keeping ï Hand defence, foot defence
- Positional play in attack and defense.
- Rules and their interpretations and duties of officials.
- Rules and their interpretations and duties of officials.
- Ground Marking.

PC – 303

Softball Fundamental Skills

- Catching: one handed, two handed, with feet grounded, in flight.
- Throwing (different passes and their uses): one handed passes (shoulder, high shoulder, underarm, bounce, lob); two handed passes (push, overhead, bounce).
- Footwork: landing on one foot; landing on two feet; pivot; running pass.
- Shooting: one hand; two hands; forward step shot; backward step shot.

- Techniques of getting free: dodge and sprint; sudden sprint; sprint and stop; sprinting with change of speed.
- Defending: marking the player; marking the ball; blocking; inside the circle; outside the circle (that is, defending the circle edge against the pass in).
- Intercepting: pass; shot.
- The toss-up.
- Role of individual players
- Rules and their interpretations and duties of officials.

PC 303

Volleyball: Fundamental Skills

- Players Stance-Receiving the ball and passing to the team mates,
- The Volley (Over head pass),
- The Dig(Under hand pass).
- Service-Under Arm Service, Side Arm Service, Tennis Service, Round Arm Service.
- Rules and their interpretations and duties of officials.

PC - 303

Hand Ball:

- Fundamental Skills-Catching, Throwing, Ball Control, Goal Throws-Jump Shot, Centre Shot, Dive Shot, Reverse Shot, Dribbling-High and Low, Attack and Counter Attack, Simple Counter Attack, Counter Attack from two wings and centre, Blocking, Goal keeping, Defense.
- Rules and their interpretations and duties of officials.

PC – 303

Basket ball: Fundamental Skills

- Player stance and ball handling
- Passing-Two Hand chest pass, Two hand Bounce Pass, One Hand Base ball pass, Side Arm Pass, Over Head pass, Hook Pass.
- Receiving-Two Hand receiving, One hand receiving, Receiving in stationary position, Receiving while jumping, Receiving while running.
- Dribbling-How to start dribble, How to drop dribble, High dribble, Low dribble, Reverse dribble, Rolling dribble.
- Shooting-Layup shot and its variations, one hand set shot, One hand jump shot, Hook shot, Free throw.
- Rebounding-Defensive rebound, Offensive rebound, Knock out, Rebound Organization.
- Individual Defensive-Guarding the man with the ball and without the ball.
- Pivoting.
- Rules and their interpretations and duties of the officials.

TP – 201 Teaching practices:

10 teaching practice lessons out of which 5 lessons in class-room situation and 5 lessons for out-door activities within premises on the students of B.P.Ed course.

TP – 301 Teaching practices:

10 teaching lesson plans for Racket Sport/ Team Games/ Indigeneous Sports out of which 5 lessons internal and 5 lessons external at school.

TP – 401 **Sports Specialization: Track and field / Gymnastics / Swimming**

(4 internal lesson at prcticing school and 1 final external lesson on the students of practicing school as a sports specialization of any discipline mentioned above.)

TP- 402 **Games Specialization: Kabaddi, Kho-kho, Base ball, cricket, Football, Hockey, Softball Volleyball, Handball, Basketball, Netball, Badminton, Table Tennis, Squash, Tennis**

(4 internal lesson at prcticing school and 1 final external lesson on the students of practicing school as a games specialization of any discipline mentioned above.)

Note: Where ever details of any activities are not mentioned, it is expected to elaborate skills by the competent bodies of local Universities.

Table – 1: Semester wise distribution of hours per week

Semester	***Theory***	***Practicum***	***Teaching practice***	***Total***
I	*16*	*24*	*00*	*40*
II	*16*	*18*	*6*	*40*
III	*16*	*18*	*6*	*40*
IV	*16*	*12*	*12*	*40*
Total	*64*	*72*	*24*	*160*
Minimum of 36 teaching hours per week is required in five or six days in a week				

Table – 2: Number of credits per semester

Semester	***Theory***	***Practicum***	***Teaching practice***	***Total***
I	*16*	*16*	*00*	*32*
II	*16*	*12*	*04*	*32*
III	*16*	*12*	*04*	*32*
IV	*16*	*08*	*08*	*32*
Total	*64*	*48*	*16*	*128*
Minimum of 36 teaching hours per week is required in five or six days in a week				

AWADHESH PRATAP SINGH
UNIVERSITY, REWA
DEPARTMENT OF PHYSICAL
EDUCATION

Ordinance
Syllabus and Scheme
of
B.P.E.S. (Bachelor of Physical Education and sport Science)
(Three Year Program)

For
UTD and for Affiliated college of
Awadhesh Pratap Singh University, Rewa

Ordinance no. 185

Bachelor of Physical Education (B.P.E.S.)

1. **Degree Title :** Bachelor of Physical Education (B.P.E.S.)
2. **Name of the Faculty :** Faculty of Physical Education
3. **Duration :** 3 Years (Six Semesters)
4. **Eligibility:**

   The candidate must have completed his/her Higher Secondary (10+2 scheme examination or Intermediate examination or the pre-university (10+2) or any other equivalent examination recognized by the M.P. Board of Secondary Education, Bhopal or any other Board recognized for this purpose by Awadhesh Pratap Singh University, Rewa as equivalent. Reservation and age rules as per State Govt.

5. **Admission Procedure:**

   As decided by Awadhesh Pratap Singh University from time to time.

6. **Total Seats:**

   As per U.G.C./N.C.T.E./other Statutory Councils from time to time.

7. **Fee Structure:**

   As decided by Awadhesh Pratap Singh University or State Govt., from time to time.

8. **Examination, Curriculum and Related Regulation:**

   As per ordinance 185 of Awadhesh Pratap Singh University.

9. **Eligibility for the award of the degree:**

   A candidate shall be eligible for the degree of Bachelor of Physical Education when he/she has completed the requirement of examination successfully as per ordinance No185.

10. **Attendance:**

    Attendance in theory and practical subjects shall be compulsory. A minimum of 75% attendance is required separately for each theory and practical's subjects.

11. **General Instruction:**

For matters not covered in this ordinance, general rules of Awadhesh Pratap Singh University, as applicable in semester examination shall apply in other matters. Executive council of Awadhesh Pratap Singh University shall be competent to take decision.

General Rules and Scheme of Examination

1. The Examination for the degree of Bachelor of Physical Education will be of six semester (three years) duration:

   (i) B.P.E.S. Semester I and Semester II

   (ii) B.P.E.S. Semester III and Semester IV

   (iii) B.P.E.S. Semester V and Semester VI

2. A candidate, who –

   (a) Completed his/her Higher Secondary (10 + 2scheme) examination or Intermediate examination or the pre-university (10+2) or any other equivalent examination recognized by the M.P. Board of Secondary Education, Bhopal or any other Board recognized for this purpose by Awadhesh Pratap Singh University, Rewa as equivalent there to or

   (b) Admission subject to : being selected on the basis of admission tests prevailing in the year when admission is sought in the department.

   (c) After obtaining Indian or foreign qualifications recognized as equivalent to those mentioned in 2 (a) above by the Awadhesh Pratap Singh University and on the basis of admission tests, shall be admitted to Semester – I for the degree of Bachelor of Physical Education.

3. The provisions of ordinance 185 will be applicable for this course.

Examination

1. For UTD the examination will be conducted according to ordinance 185. and for affiliated colleges according to ordinance.

2. The medium of instruction shall be Hindi / English and a candidate can take examination either in Hindi or English.

ORDINANCE - 185

Academic Programmes of School of Studies/ Institute/ Centre/University Teaching Departments

I. An Ordinance to promote development of autonomous SOS/ Institute/ Centre/UTD as per U.G.C. guidelines. Here after it is referred as UTD.

II. Norms and standards prescribed by NCTE/UGC/State Government or any other competent body for admission of B.P.E.S. Course shall be followed.

III. Notwithstanding anything contained in any other statutes, ordinances, regulation etc. the provisions of this ordinance will be applicable hereinafter.

1. The UTD of Awadhesh Pratap Singh University will be responsible for Instituting, Planning, Monitoring, Assessing and modifying their educational programmes. The Faculty members of the concerned UTD will take all decision.

2. Subject to the approval of Vice-Chancellor, Standing Committee of Academic Council, Executive Council, new programmes and courses will be INSTITUTED with the help of the Faculty members of concerned UTD. The existing programmes may be modified by the UTD.

3. Head of a concerned UTD will ADMIT students into different programmes as per the criteria evolved by the UTD/ University / Government.

4. 1. (a) The Semester will consist of 18 weeks and a Trimester of 12 weeks. One hour of Lecture / Tutorial per week for one semester will constitute ONE credit. In case of Trimester one hour Lecture / Tutorial per week for one Trimester will correspond to 2/3 Credit.

   (b) One hour per week of Laboratory work for One Semester will constitute 1/2 credit. While in Trimester one hour per week for One Trimester correspond to 1/3 credit.

   2. The concerned UTD must workout the Valid Credits for each programme at the rate of 52 Credits per year.

5. A typical programme in a SEMESTER CONSISTS of 12- 15 credits of lecture / tutorial and 12-15 credits of laboratory / project work. A load of about 26 credits shall be completed on an average in one semester.

   A Full time student is required to obtain NECESSARY NUMBER OF CREDITS IN three years or less for a FOUR semester programme and one and a half year for a two semester course. Core (compulsory) and Elective (Optional) courses may be prescribed by concerned UTD.

6. A student will be eligible for degree on completion of 52 VALID CREDITS per year provided he / she does not have F Grade in any of offered courses. The student should be appear in all theory practical and sessional examination otherwise promoted or fail.

7. (a) During the semester, a teacher will ASSESS each student at THREE points of time. Of these, TWO must be written tests and the third may be written test / Quiz / Seminar for theoretical courses. The mode of assessment of laboratory work will be through day-to-day practical. In each course, there shall be End Semester Exam. Each student has to appear in at least Two Tests and End Semester Exam; otherwise, the student will be awarded F - Grade in that course.

(b) Tests will be essential part of evaluation system. These tests will be conducted regularly. In case a teacher is absent or not available, the Head of UTD will make ALTERNATE ARRANGEMENTS for regular completion of examination work. In general, assessment of courses involves usual marking in the first instance. Marks of each candidate obtained in tests, quizzes, etc. and End Semester Exam for a course be totaled and TRANSFORMED into PERCENTAGES. For computing PERCENTAGE, out of THREE Assessments best TWO will be considered along with the End Semester Exam marks.

(c) For each course, out of 100 marks, 60 marks will be for the End Semester Exam & 40 marks for each assessment.

(d) These TRANSFORMED SCORES will be converted into grade as follows :

Grade Point

Transformed Score	Grade
>= 90.%	A+
>=80.00% but <90.00%	A
>=70.00% but < 80.00%	B+
>=60.00% but < 70.00%	B
>=50.00% but < 60.00%	C+
>=40.00% but < 50.00%	C
>=30.00% but < 40.00%	D
< 30.00%	F

(e) If any student obtains F Grade in any course, she / he is treated to have failed in the course. He / She has to reappear in tests and End Semester Exam of the failed course as and when it is offered or as per Ordinance. Only one additional chance will be given.

(f) However, a teacher must design assessment procedures which show REASONABLE DISCRIMINATION in the given set of scores. It implies that a

considerable part of the test will be PROBLEM ORIENTED (and not merely essay or reproduction of text).

(g) Aggregate marks 38% are essentials to pass the examination.

(h) Overall division shall be calculated adding both theory and practical marks.

8. The FINAL DEGREE should indicate the Division obtained.

Division	
1st Division	60% and above marks
2nd Division	48% and above but below 60% marks
Fail	

There will be no THIRD DIVISION

9. Back paper/Improvement candidate can re-appear as a private candidate(Ex-Empted Student) in theory/Practical examination
10. The decision of the teacher regarding the evaluation and the grade shall be final. However, REEVALUATION is allowed only if :
    - The prescribed fee is paid to the university
    - The candidate applies through the Head within 5 days of the declaration of the grade of the course concerned.
    - Assessment mode is written for that course/activity.
    - A Board reviews the case.
    - Revision of the grades is accepted both in the increasing and decreasing directions.
    - Revaluation is effective only if the grade changes.
11. The PRACTICALS will be continuously evaluated through out the semester (s) experiment by experiment/activity by activity and will be shown separately for grading purposes.
12. At the end of each Semester, assessment of Project / Practical examination will be conducted by a BOARD of at least TWO examiners. One of these examiners will not be connected with the Practical / Project work.
13. (a) At the end of a semester, a COMPREHENSIVE VIVA-VOCE Examination for theory and practical will be conducted by the Board of 4 members, at least ONE of whom shall be external. The Vice-Chancellor will appoint the external members in consultation with Head/Chairman Evaluation Unit or Concerned UTD. Three will

form a quorum. Head/Chairman Evaluation Unit or Concerned UTD will coordinate the comprehensive viva - voce. The grades awarded in the viva-voce shall be shown separately.

(b) In case of LARGE NUMBER OF STUDENTS there may be as many Boards as necessary with at least TWO MEMBERS IN EACH board.

14. The MARK SHEET will be PREPARED in triplicate by the UTD:

(a) One will be sent to Registrar and collected at the end of subsequent semester for entries and returned to the Registrar.

(b) Second will be given to the candidate and updated every semester,

(c) Third will be retained by the UTD.

15. In the MARK SHEET the following information should be given :

(a) Grades obtained in different courses

(b) Semester Grade Point Average

(c) Cumulative Grade Point Average

(d) Graduating Grade Point Average (after the requirements are completed)

16. In case any dispute arises regarding interpretation of these rules or in giving effect to the provisions of this Ordinance the matter shall be referred to the Vice Chancellor whose decision thereon will be final.

SCHEME OF EXAMINATION (As per Ordinance 185)

B.P.E.S. SEMESTER – I

Part – A (Theory Papers)		Maximum Marks	
		External	Internal
T-1	Basic and Systemic Anatomy - I	60	40
T-2	Principles of Physical Education	60	40
T-3	English - I	60	40
Part – B (Practicals)			
P-1	Athletics - I	60	40
P-2	Gymnastics - I	60	40
P-3	Yoga - I	60	40
P-4	Conditioning & Match Practice Conditioning - 60 marks Match Practice - 40 marks	-	100
Part –C (Viva-voce)			
C-01	Comprehensive Viva-voce	100	
	TOTAL	**460**	**340**
	Grand Total	**800**	

B.P.E.S. SEMESTER – II

Part – A (Theory Papers)		Maximum Marks	
		External	Internal
T-4	Basic and Systemic Anatomy - II	60	40
T-5	History of Physical Education	60	40
T-6	English - II	60	40
Part – B (Practicals)			
P-5	Athletics - II	60	40
P-6	Gymnastics - II	60	40
P-7	Yoga - II	60	40
P-8	Conditioning & Match Practice Conditioning - 60 marks Match Practice - 40 marks	-	100
Part –C (Viva-voce)			
C-02	Comprehensive Viva-voce	100	
	TOTAL	460	340

Grand Total **800**

B.P.E.S. SEMESTER – III

Part – A (Theory Papers)		Maximum Marks	
		External	Internal
T-7	Physiology and Physiology of Exercise	60	40
T-8	Educational Psychology	60	40
T-9	Methods in Physical Education	60	40
Part – B (Practicals)			
P-09	Volleyball	60	40
P-10	Weight Lifting and Training	60	40
P-11	Teaching Practice	60	40
P-12	Conditioning & Match Practice Conditioning - 60 marks Match Practice - 40 marks	-	100
Part –C (Viva-voce)			
C-03	Comprehensive Viva-voce	100	
	TOTAL	**460**	**340**

Grand Total **800**

B.P.E.S. SEMESTER – IV

Part – A (Theory Papers)		Maximum Marks	
		External	Internal
T-10	Kinesiology	60	40
T-11	Basics of Sports Training	60	40
T-12	Health Education	60	40
Part – B (Practicals)			
P-13	Badminton/ Hockey	60	40
P-14	Football/ Cricket	60	40
P-15	Teaching Practice	60	40
P-16	Conditioning & Match Practice Conditioning - 60 marks Match Practice - 40 marks	-	100
Part –C (Viva-voce)			
C-04	Comprehensive Viva-voce	100	
	TOTAL	**460**	**340**

Grand Total **800**

B.P.E.S. SEMESTER - I

BASIC AND SYSTEMIC ANATOMY- I

Unit - I Introduction

(i) Meaning and Concept of Anatomy
- a. Definition of Anatomy
- b. Types of Anatomy

(ii) Need and Importance of anatomy for the students of Physical Education.

(iii) Minute structure and functions of cells.
- a. Structure of cell
- b. Properties of cell
- c. Constituents of cell and their functions

(iv) Minute structure and functions of tissues
- a. definition of tissue
- b. Classification of tissues
- c. Structure and functions of various types of tissues

Unit - II Skeletal System

(i) **Brief introduction about the skeletal system**
- a. composition of bone
- b. Microscopic structure of bone
- c. Classification of bones
- d. Functions of bones
- e. General features of major bones of human body
- f. Brief introduction about skull bone

(ii) **Joints**
- a. Definition of joints
- b. Classification of Joints
- c. Anatomical structure of synovial joints
- d. Characteristics of synovial joints
- e. Terminology of movements around a joint

Unit - III Muscles
- a. Structural classification of muscles
- b. Functional classification of muscles
- c. Microscopic structure of muscles (skeletal, cardiac and smooth)
- d. Functions of muscles (skeletal, cardiac and smooth)
- e. Properties of skeletal muscles (elasticity, contractibility, stretchibility, irritability and muscle tone)
- f. Location (origin and insertion) and action of important muscles of human body (shoulder girdle, shoulder joint, elbow joint, hip joint, knee joint, ankle joint)

Unit - IV Cardio – vascular system
- a. Introduction about heart and cardiovascular system
- b. Structure of heart
- c. Structure of artery, veins and capillaries
- d. Blood flow through the heart
- e. Types of blood circulation
- f. Pumping action of heart and its regulation
- g. Introduction about mechanism of the contraction of heart
- h. Introduction about regulation of heart beat

Unit - V Respiratory system

a. Introduction about respiratory system
b. Organs of respiratory system
c. Structure of organs
d. Types of respiration
e. Muscles of respiration
f. Mechanism of respiration

Books Recommended :

a. MC Clerg, Anderon T., Human Kinetics and Analyzing Body Movements, London : William Hein Mann Medical Book Ltd.
b. Davis, D.V. Gray's Anatomy : London : Longmans Green and Co. Ltd.
c. Pcatce, Evelyn B., Anatomy and Physiology for Nurse : London faber and faber Ltd.
d. Pearce, J.W. Anatomy for students and teachers of Physical Education, London : Edward Arnold and Co.
e. Anderson, T. Mc. Clerg. Human Kinetics and Analyzing Body Movements, London : Wiliiam Heinman Medical Books Led. 1961.

B.P.E.S. SEMESTER – I

PRINCIPLES OF PHYSICAL EDUCATION

Unit – I

a. Meaning and Definition of Physical Education.
b. Aims and objective of Physical Education.
c. Scope of Physical Education.
d. Need and Importance of Physical Education.
e. Physical Education as an Art as Science

Unit - II

a. Meaning of Sports Psychology
b. Development of sports Psychology
c. Psychological factors effecting physical Performance.
d. Notion about mind and body Psychological unity of man

Unit - III

a. Meaning of Camp
b. Aims and objective of the Camps
c. Uses of Camping /outdoor education.
d. Types of Camp and Agencies promoting Camping.
e. Organization of Camps and factors effecting its organization.
f. Meaning and Definition of Recreation.
g. Aims and objectives of Recreation.
h. Types of Recreation & need and Importance of recreation in modern society

Unit - IV

a. Definition of physical fitness.
b. Component of Physical fitness.
c. Benefit of Physical fitness.
d. Effect of Exercises on muscular ,circulatory ,digestive ,Respiratory system.
e. Warming up and cooling down and their Importance.
f. Biological Basis of life and biological weakness.
g. Chronological ,Anatomical ,Physiological and Mental ages of individual – their implications in developing and implementing programme of physical education.

Unit - V

a. Games and sports as mans cultural heritage
b. Sports and socialization
c. Physical Education and sports as a need of the society
d. Social Institution and their influence on the society.

References:

1) Bucher, Charles,A. Foundation of physical Education St. Louis: The C.V.Mosby Co. 1986 dollar 9.50.
2) Nixon Engene D. and Couson W. An introduction to physical Education , Philadelphia,London: W.B.Saunders Co. 1969,
3) Oderteuter ,Delbert : Physical Education , New York ,Harper and Brothers publishers 1970.
4) Sharma ,Jakson ,R. Introduction to physical education , New York: A.S Barnes and Co. 1964.
5) Willaims Jeses Feiring : The Principle of Education, Philadelphia : W.B.Saunders Co. 1964

B.P.E.S. SEMESTER – I

ENGLISH- I

Unit - I

a Tenses: Present, Past and Future Tenses.

b Vocabulary: Synonyms, Antonyms, One word, Substitution, Punctuation.

c Preposition.

d Co-ordinate Conjunction and Subordinate Conjunction

e Gender & their uses.

Unit - II

a Article : A, An, and The

b Syntax & their uses & applications.

c Active & Passive Voice

d Idioms & Proverbs: Meaning and uses.

Unit - III

a Sentences Structure – Simple and Complex Sentences.

b Transformation (with and without changing the sense)

c Interrogative Sentences

d Imperative Sentences

e Exclamatory Sentences

Unit - IV Paragraph and Essay Writing

a Writing paragraphs and essays on topics concerning sports and general awareness.

Unit - V Comprehension

a Precise writing

b Answering questions after reading passages.

c Comments on reading material.

References:

1. 'High School English Grammar and Composition by P.C. Wren and M.Martin, Published by S.Chand and Com. Ltd. Ram Nagar, New Delhi 110055.
2. An intensive Course in English – Aremedial work book C.d. Sidhu. Published by Prya Adarkar, Orient Longman Ltd. Kamani Marg, Ballard Estate Bombay 400048.
3. Living English Literature Practice Book for Foreign students W. Standard Alton, Orient Longman Ltd. 1/24, Asaf Ali Road, New Delhi 110002.

B.P.E.S. SEMESTER – I

GAMES (PRACTAL)

ATHLETICS, GYMNASTICS AND YOGA

Common syllabus all games

Unit- I. History of game, Federations and Competitions.

Unit- II. Rules and their interpretation.

Unit- III. Fundamental and Advance skills.

Unit- IV. Equipments and their specification and maintenance.

Unit- V. Layout and maintenance of playfields

B.P.E.S. SEMESTER – II

BASIC AND SYSTEMIC ANATOMY

Unit I : Digestive System

(i) **Introduction about digestive system**
- Organs of digestive system
- Structure of various parts of digestive system
- Brief introduction about the accessory organs of digestive system (liver, pancrease, gall bladder)

(ii) **Secretion and function of the digestive juices**
- The name of digestive juices
- Their site of secretion, nature and function

(iii) **Function of Liver**
- Functions of liver as an accessory organ of digestion
- Brief knowledge of general function of liver

Unit II : Nervous System

(i) **Introduction about the nervous system**
- Introduction about the nervous system
- Classification and organs of nervous system
- Introduction about various parts of brain
- Structure of various parts of brain
- Structure of spinal cord

(ii) **Functions of the important parts of the nervous system**
- Functions of cerebrum
  (Basal ganglia, Thalamus & Hypothalamus)
- Functions of cerebellum
- Functions of mid brain
- Functions of pones
- Functions of medulla oblongata
- Functions of spinal cord
-

Unit III : Urino – Genital and Excretory System

(i) **Brief account of urino-genital system**
- Introduction about urinal system
- Structure of kidney
- Structure of ureter, bladder, urethra
- Introduction about genital system

(ii) **Introduction about excretory system**
- Brief concept of excretion of water from the body through skin (sweating), lungs, kidney and urinal track
- Structure of kidney and urinal track
- Formation of urine in kidney
  (Simple filtration, selective reabsorbs ion and secretion)

Unit IV : Endocrine System

- Introduction about endocrine system
- Name of endocrine glands and their sites
- Structure of glands (Pituitary, Thyroid, Pancrease and Adrenal)
- Secretion of glands (Pituitary, Thyroid, Pancrease and Adrenal)
- Role of their secretion in growth, development and body functions
- Basic knowledge of transmission of hereditary characteristics

Unit V : Sensory System

- Structure of organs of vision
- Functions of various parts of eye
- Structure of organs of hearing
- Functions of various parts of ear
- Brief introduction of sense of touch (skin), smell and taste

Books Recommended:

1. MC Clegg, Alderon T., Human Kinetics and Analyyzing Body Movements, London: William Hein Mann Medical Book Ltd.
2. Davis, D.V. Gray's Anatomy: London: Longmans Green and Co. Ltd.
3. Pearce, Evelyn B., Anatomy and Physiology for Nurse: London faber and faber Ltd.
4. Pearce, J.W. Anatomy for students and teachers of Physical Education, London: Edward Arnold and Co.
5. Anderson, T. Mc. Clerg. Human Kinetics and Analyzing Body Movements, London: William Heinman Medical Books Led. 1961.

B.P.E.S. SEMESTER – II

HISTORY OF PHYSICAL EDUCATION

Unit I

- Definition of Physical Education – Its meaning and importance, misconception above Physical Education
- Aims and objectives of Physical Education.

Unit II

- Physical Education in ancient India – Vedic period – Epic Period and Buddhist period.
- Physical Education in the city states of Greece.

Unit III

- Survey of Modern Physical Education in India – pre and post independence period
  a. Physical Education and sports training institutions in India.
  b. Indian Olympic Association.
  c. Sports authority of India
- Youth welfare programmes NCC, NSS, NSC, Scouts and guides.

Unit IV

Modern Olympic games: Start of Olympics, Objectives of Olympic, Olympics Motto and Flag. Olympic charter opening and closing ceremonies, Olympic commissions and their functions.

Unit V

Contribution to the growth of Physical Education by leaders and movement in the following countries.

(i) Germany Johan Basedow, Guts Muths Fredrick Ludwing John , Sweden (Per Henric ling)
(ii) Denmark (frak Nachtegal)
(iii) Great Britain Y.M.C.A. and it contribution,
(iv) India : Pl. Jawaharlal Nehru , Dr. P.M. Joseph Dr. J.P. Thomas , Shri H.C. Buck.

References:

1. Leonard, Fred Engene and Afflect George B. Guide to the History of Physical Education, Philadelphia : Leo and Febiger, 1962.
2. Moyumd, D.C. Encyclopedia of Indian Physical Culture, Garoda : Goods Oscupauies, 1952.
3. Rice Emmett, A. Hutchinson, John, L. and Loc Marbal A Brief History of Physical Education, New York, the Ronals Press Company, 1960.
4. Rajgopalan R. A Brief History of Physical Education in India, Delhi Army Publishers – 1962.
5. Wakharkar, D.G. Manual of Physical Education, Bombay Port Publishers Pvt. Ltd.

B.P.E.S. SEMESTER – II

ENGLISH - II

Unit - I Correspondence and report writing :

a. Personal Letters
b. Business Letters
c. Application
d. Circular Letter
e. Invitations refusal and acceptance, formal, informal and vote of thanks, welcome speech

Unit - II

a. Reports writing (on functions and sports events).
b. Drafting notice and minutes of meeting.

Unit - III Linguistic Contents :

a. Direct and indirect speech.
b. Verbal structure, approritive structures.
c. Optative sentences.
d. Sentences structure – Simple, compound and complex sentences.

Unit – IV

a. Expansion of ideas (about 200 words).
b. Adjectives, adverbs & their uses
c. Modals
d. Punctuation
e. Participles
f. Determinants

Unit – V

a. Paragraph and Essay writing -

Writing paragraphs and essays on topics concerning sports and general awareness.

b. Comprehension -

1. Precis Writing
2. Answering questions after leading passages.
3. Comments on reading material.

References:

1. 'High School English Grammar and Composition by P.C. Wren and M.Martin, Published by S.Chand and Com. Ltd. Ram Nagar, New Delhi 110055.
2. An intensive Course in English – Aremedial work book C.d. Sidhu. Published by Prya Adarkar, Orient Longman Ltd. Kamani Marg, Ballard Estate Bombay 400048.
3. Living English Literature Practice Book for Foreign students W. Standard Alton, Orient Longman Ltd. 1/24, Asaf Ali Road, New Delhi 110002.

B.P.E.S. SEMESTER – II

GAMES (PRACTAL)

ATHLETICS, GYMNASTICS AND YOGA

Common syllabus all games

Unit- I. History of game, Federations and Competitions.

Unit- II. Rules and their interpretation.

Unit- III. Fundamental and Advance skills.

Unit- IV. Equipments and their specification and maintenance.

Unit- V. Layout and maintenance of playfields

B.P.E.S. SEMESTER – III

PHYSIOLOGY AND PHYSIOLOGY OF EXERCISE

Unit I Introduction

(a) Meaning and concept of physiology.
(b) Need and importance of physiology for the students of physical education.
(c) Meaning and concept of exercise physiology.
(d) Need and importance of exercise physiology in physical education and sports.

Unit II Cardio Pulmonary System

1. The Cardio- vascular system and Blood.
   (a) Cardiac – cycle.
   - Definition of cardiac cycle
   - Concept of cardiac cycle with the help of diagram.

   (b) Blood pressure, its maintenance and regulation
   - Definition of blood pressure.
   - Types of blood pressure.
   - Measurement of blood pressure.
   - Regulation of blood pressure.

   (c) The cardiac output and its regulation
   - Concept of cardiac output.

2. The respiratory System
   1. Mechanism of Respiration.
   2. Pulmonary ventilation and its regulation.
   3. Second – wind, Oxygen debt.

Unit III Digestive, nervous and sensory system

(a) Digestive System
   1. Absorption of Food
   2. General metabolism, metabolism of carbohydrates fats and proteins.
   3. Temperature – Regulation

(b) Nervous System
   1. Functions of the important parts of the nervous system, cerebrum, medulla oblongata, thalamus, cerebellum and spinal card.
   2. Functions of autonomic nervous system.

(c) Sensory System
   1. General sensations (cutaneous and kinesthetic)
   2. Brief knowledge about various forms of senses with special reference to vision and hearing.

Unit IV Excretory, Endocrine and Reproductive Systems

(a) The excretory System -
Excretion of water from the body through skin (sweating), lungs, kidney and GI Tract.

(b) The Endocrine System -
   1. Secretion of endocrine glands (Pituitary, Thyroid, Adrenal and Pancreas)
   2. Role of their secretion in growth. Development and body functions.

(c) Roproductive System -
   1. Physiology of human reproduction.
   2. Basic knowledge of transmission of hereditary characteristics.

Unit V Physiology of Exercise

1. Effect of exercise on respiratory, circulatory and muscular system
2. Changes during muscular contraction.
3. Nerve control of muscular activity.
4. Warming-up, conditioning and training.
5. Stitch and cramps.

References:

1. Anthony, C. Parher and Kolthoff N. Jane, Text Book of Anatomy and Physiology, St. Louis : The C.V.: Mosby Company.
2. Chatterjee, C.C. Human Physiology, Calcutta, Medical Allied Agency.
3. Clarke, David, H. Exercise Physiology, New Jersey : Prentice Hall Inc., Englewood Cliffs.
4. Translated by Mysline, David, A. Text Book for Nurses Training Schools, Moscow, NIR Publishers.
5. Pearce, Evelyn, C. Anatomy and Physiology for Nurses. Calcutta, Oxford University Press.

B.P.E.S. SEMESTER – III

EDUCATIONAL PSYCHOLOGY

Unit I :

- Meaning and Nature of Psychology
- Sources of psychology
- Definition of Psychology
- Psychology is a Sciences
- Branches of Psychology
- Importance of Psychology in Education with special reference to Physical Education.

Unit II:

- Growth and Development
- Meaning of growth and Maturation
- Development by maturation
- Development by exercise and learning
- Behavioral development with special reference to perceptual ,Language intellectual social, emotional and physical
- Individual differences: meaning of the terms individual differences.
- Heredity and environment as cause of individual differences
- Interaction of heredity and environment.

Unit III :

- Learning Meaning and nature of learning
- Principles of learning
- Types of learning
- Theories of learning (Trial and error ,conditioned reflex ,insight theory, learning by imitation).
- Meaning of transfer of training. Conditions of transfer of training. learning curve.
- How to overcome plateau

Unit IV:

- **Motivation**

  Meaning of motivation. concept of need, drive, motive, incentive and achievement.

  Types of Motivation

  Role of motivation on teaching physical activities
- **Emotion**

  Meaning and nature of emotion.

  Types of emotion.

  Emotional experiences (anxiety and fear) and their effect on learning of physical activities.

Unit V:

- **Personality**

  Meaning and nature of personality.
  Physiological and social factors in personality.
  Development of personality

- **Memory**

  Definition of memory, Types of Memory.

  Mechanism of the process of remembering ,memory training.
  Meaning of forgetting ,Reasons of forgetting, curves of forgetting,
  Importance of memory in learning physical activities.

- **Practical**

  Practical will be conducted to acquaint with practical aspects of the subject. There will be practical internal examination for 10 marks .The marks of this examination will be added to the theory sectionals.

References :

- Boaz, G.D General psychology , Madras: Boaz institute of Psychological Service,1957
- Skinner, C. E. Educational Psychology ,New Delhi : Prentice Hall of India Pvt. Ltd.
- Lindren, H. E. Educational Psychology in classroom ,New York :John Wiley & Sons Inc. 1963.
- Kamlesh ,M.L. Psychology of Physical Education and Sports , New Delhi Metropolitan Bros.
- Snum, Richar M. Psychology in Sports ,Surjeet Publication ,1982
- Silva ,J.M. and Weinberg R.S Psychology of foundations of Sports , Illinois , Human Kinetics Publishers Inc.

B.P.E.S. SEMESTER – III

METHODS IN PHYSICAL EDUCATION

Unit I

(A) Meaning

Meaning of the term" teaching method" its scope and importance
The factors to be considered in determining the method of teaching.

(B) Types of method

Part-whole method, whole part method, command method, discussion method, project method, demonstration method.

(C) Principles of teaching

Unit II

Presentation Techniques

(a) Personal preparation.
(b) Technical preparation.
(c) Steps of presentation.
(d) Command and their techniques.
(e) Situation which require different words of command.
(f) Types of class management.

Lesson planning

Types of lessons and their values

(a) Objectives of different lesson plans and part of the lesson introductory and development.
(b) Skill practice/group work.
(c) Class activity/recreation part (reassembly revision and dismissal).

Unit III

Organization and conduct of competitions

(a) Tracks and field
(b) Gymnastics.
(c) Weight lifting, body building and best physique contest.
(d) Wrestling and combatives.
(e) Swimming, diving -aquatics.
(f) Games and sports tournaments.

Tournaments – organization, meaning and their types

(a) Knock -out types of elimination double elimination tournaments..
(b) League-(single-double) or round robin type.
(c) Combination type of tournament.
(d) Challenge of perennial type (ladder-pyramaid type).
(e) Miscellaneous type of small area games.

Unit IV

Audio-visual aids and teaching gadgets

(a) Values and uses of audio visual aids.

(b) Criteria for selecting the aids.

(c) Steps to be followed in using teaching aids.

Publicity - meaning and method of preparation:

(a) Demonstration.

(b) Play days.

(c) Exhibitions.

(d) Sports for all days.

Unit V

Marking of track and play fields:

(a) Track and field - track 400 m standard and 200m.

(b) Play field - football, volleyball, basketball, hockey, badminton, kabaddi, kho-kho, softball as per international regulation.

Improvisation - ways and means of improvisation:

(a) Area

(b) Apparatus

(c) Equipment

(d) Leadership

(3) Evolution

(a) Need

(b) Importance

(c) Basic methods of evaluation:

- Observation
- Interview
- Tests and measurements
- Cooperative evaluation by pupil and teacher

References:

- Tirunaryanan, c. and hariharan, s. methods in physical education,karai kudi south india press, 1962.
- Kozman, b. cassidy, rosalind and jakson,c.d.,methods in physical education, london: w.b. saunders company, 1960.
- Knapp, clyde and hagman, e.p. teaching methods foe physical education, new yoek: mc graw hill book co., 1948.

B.P.E.S. SEMESTER – III

GAMES (PRACTAL)

VOLLEYBALL AND WEIGHT LIFTING & TRAINING

Common syllabus all games

Unit- I. History of game, Federations and Competitions.

Unit- II. Rules and their interpretation.

Unit- III. Fundamental and Advance skills.

Unit- IV. Equipments and their specification and maintenance.

Unit- V. Layout and maintenance of playfields

B.P.E.S. SEMESTER – IV

KINESIOLOGY

Unit I: Introduction

(A) Definition, Brief history and important contributions of Aristotle, Leonardo da Vinchi, Alfonso Borelli, Weger Brothers, Benjamin Duchene.

(B) Aims and objective of Kinesiology.

(C) Role of Kinesiology in Physical Education and Physical Medicine.

(D) Fundamental concepts:

Definition and brief explanation of the following terms and their application to the human body.

Axes and Planes, Centre of Gravity, Line of Gravity Base, Starting Positions.

Unit II: Anatomical Concepts

(A) Review of classification of joints and muscles, Terminology of fundamental movements.

(A) Types of Muscle-Contraction (Isometric and Isotonic – concentric, Eccentric), All or None Law, Reciprocal innervations and inhibition group action of muscles and Muscular Co-ordination.

(B) Major characteristics location and action of major joints of shoulder, hip, knee, elbow, forearm and wrist joints. Location and actions of major muscles at these joints.

Unit III: Mechanical Concepts

(A) Concept of mechanical basic of Kinesiology and its application it physical education and Sports.

(B) Definition and brief explanation of following basic terms :

Mass, weight, force, motion, equilibrium, friction, speed, velocity, and momentum.

Unit IV:

(A) Kinesiological fundamental of Mechanisms

(1) Simple Mechanics found in the Muscular skeletal system (Leverage and its application to human body)

(2) Laws of motion and their application to sports activities.

(3) Forces :

a. Moving one's own body.
b. Giving impetus to external objectives,
c. Receiving impetus.

(4) Equilibrium: Role of equilibrium in sports and games.

Unit V: Application

(A) Application of basic mechanical principles to walking, running and jumping.

(B) Motor skills in daily living.

(C) Application of mechanics prevention of injury.

Reference:

- Brower, Marion, R. Efficiency of Human Movement. Philadelphia : W. B. Saunders Co. 1966-Dellar.
- Cooper, John M. and R.B. Glassgow . Kinesiology . St Louis : C.V. Mosby Company , 1963.
- Scott M. Gladys Analysis of Human Motion, New York .
- Wells, Katherine P. Kinesiology , Philadelphia. W.B. Saunders Co., 1966.
- James, G. Hay, J. Gavin Reid. The Anatomical and mechanical Bases of Human Motion. Prentice Hall Inc. New Jersey.
- Rasch Philip J. and P.K. Burke. Kinesiology and Applied Anatony. Philadelphia. : LEA and Febiger, 1967.
- Duan, John W. Scientific Principles of Coaching . Englewood cliffs, N.J. Prentice Hall Inc. 1966.
- Duvall Elien Neal. Kinesiology . Englewood Cliffs , N.J. Prentice Hall Inc. 1956.

B.P.E.S. SEMESTER – IV

BASICS OF SPORTS TRAINING

Unit - I Sports Training

a. Definition of terms - Conditioning, Teaching, Coaching and Sports Training.
b. Importance of sports training
c. Aim, Tasks and Characteristics of Sports Training.
d. Principles of Sports Training.

Unit - II Biomotor abilities and training means -

a. Concept of biomotor abilities & definition of important motor abilities – cardio – respiratory endurance, muscular endurance, strength, speed, power, agility, flexibility, co-ordination, balance.
b. Training means and methods for developing various fitness components.

Unit - III Warming up and cooling down

a. Introduction
b. Types of warming up
c. Significance of warming up
d. General guidelines that govern the warming up programme
e. Methods of warming up
f. Duration of warming up
g. Components of warming up
h. Physiological basis of warming up

Unit - IV Environmental factors and sports performance

a. Introduction
b. Variation in temperature
c. Humidity
d. Altitude
e. Physical programme at altitude
f. Physiological function at altitude

Unit - V (A) Preiodisation

a. Concept of periodisation and its importance.
b. Different periods of training and their duration.
c. Types of periodization.
d. Aim and content of different training periods.

(B) Cycles of Training

a. Macro Cycle
b. Meso Cycle
c. Micro Cycle

References:

1. Essentials of Physical Education, Dr. Ajmer Singh, Dr. Jagtar Singh Gill, Dr. Jagdish Bains, Dr. Rachhpal Singh Brar, Kalyani Publishers, Ludhiana, New Delhi, Noida (U.P.)
2. Science of Sports Training, Dr. A.K. Uppal, Friends Publications, New Delhi (India)
3. Science of Sports Training, Hardayal Singh
4. Bratty, s perceptual and motor development in infants and children. Prentice hall 1979
5. Harre, d. principles of training.

B.P.E.S. SEMESTER – IV

HEALTH EDUCATION

Unit I

(A) Health

a. Dimensions of Health
b. Positive Health
c. Concept Of Health
d. Ecology of Health
e. Spectrum of Health
f. Determinants of Health.

(B) Health Education

a.. Concept ,objective and scope
b. Principles of Health Education.
c. Communication in Health Education.
d. Public Health Education in attainment of Health Goals.

Unit II

(A) Health Problems

a. Communicable diseases
b. Nutrition
c. Environmental sanitation
d. Medical Care
e. Population

(B) Organizational and Administrative set-up of Health System in India

a. Central Level
b. State Level
c. District Level

(C) Planning of Health Education programme

a. Practice of Health Education Programme.
b. Steps to be followed in Planning and Heath Education Programme.

(D) Brief Description of Maternal Child Health

Unit III

(A) Hygiene

The Concept, Care of Skin, Mouth, nails, clothing, bathing etc.
Importance of rest, sleep and exercise.

(B) Community Health

Brief account of Rural sing water supply ,sewage and refuse disposal .

(C) School Health Service

a. History and Health Problems
b. Objectives of School Health Service

(D) Aspects of School Health Service

a. Health Appraisal
b. Remedial measures and follow –up
c. Prevention of communicable diseases
d. Healthful school environment
e. Nutritional services
f. First –aid and Emergency care
g. Mental health
h. Dental health
i. Eye health service.
j. Health Education
k. Education of handicapped children.
l. School Health record.

Unit IV

(A) Food and Nutrition

Classification of foods ,Proximate Principles, and Role of various nutrient.

(B) Balanced diet

Definition ,Principles of preparing and balance diet. Balanced diet for Indian Players /School children .Malnutrition and Adulteration of food.

Unit V

(A) National Family Welfare Programme

Concept, need, importance, and role of Health Education in family welfare programme.

(B) Sex Education

Concept, need and organization of sex education at school level.

(C) National Health Programmers in Indian

(a) NMEP (National Malaria Eradication Programme.)
(b) DDCP (Diarrhoeal Diseases Control Programme.)
(c) NFCP (National Filaria Control Programme.)
(d) National TB Control Programme.
(e) STD Control Programme.

(D) International Health Agencies

(a) WHO (b) UNICEF (c) UNDP
(d) FAO (e) ILO

(E) Evaluation

(a.) Evaluation of Health Education Programme.
(b.) Importance of Evaluation of Health Education Programme.

Reference:

1. Anderson ,C.L. and Chewell , William H. School Health Practice, St. Louis: The C. V. Mosby Company ,1986.
2. Bedi, Yashpal Social and Preventive Medicine ,New Delhi ,Atmaram and Sons ,1985.
3. Goah ,B.N. Hygine and Public Health ,Calcutta :Scientific Publishing Co.1989.
4. Hanlon, John ,J. Principal of Public Health Administration Saint Louis :The C.V. Mosby Company 1969.
5. Katz, Alfred ,H ,and Felton , Jean Spences Health and the community .London :Coltion Mc Millan Limited 1965.
6. Park ,J.E. and Park ,K. Preventive and Social medicine Jabalpur : M/s.Banarsidas Bhanot Publishers 1983.

B.P.E.S. SEMESTER – IV

GAMES (PRACTAL)

BADMINTON/HOCKEY AND FOOTBALL/CRICKET

Common syllabus all games

Unit- I. History of game, Federations and Competitions.

Unit- II. Rules and their interpretation.

Unit- III. Fundamental and Advance skills.

Unit- IV. Equipments and their specification and maintenance.

Unit- V. Layout and maintenance of playfields

B.P.E.S. SEMESTER V

MANAGEMENT OF PHYSICAL EDUCATION

Unit I

Introduction

(a) Meaning and definition of planning, organizing, administration and management and their nature and scope.

(b) Importance of planning and management in educational institutions.

(c) Principles of planning and management, organization structure:

(i). Working out an effective scheme of organization.

(ii). Scheme of organization in school, college and university.

(iii).Scheme of organization in the district and state education.

Unit II

Facilities and equipments

(a) Layout of the school building and other facilities.

(b) Types of buildings, laboratories, other built-up facilities.

(c) Layout of physical education facilities common and special.

(d) Need and importance o equipment for physical education and recreation

(e) An ideal of equipment or physical education and recreational activities.

(f) Realistic approach in purchases, procedures.

(g) Development of improvised equipments

(h) Storing, store keeping.

(i) [illegible]tenance, repairs and disposal equipments.

Unit III

Staff and Leadership

(a) Head of the Institute, his role in imbibing the spirit of discipline in sports and education.

(b) Importance of qualified teachers of physical education and recreational leaders

(c) Qualities of good teachers /teachers of physical education

(d) Development of voluntary services of other teachers.

(e) Student leadership it's importance and limitations

(f) Staff cooperation

(g) Selection of training of students leaders

(h) Recognition of staff and student leaders.

Unit IV

Intramurals and Extramural, Public Relations

(A) Intramural

(a) It's importance and planning.

(b) Events of Competition, Time and facility factors.

(c) Point system, award recognition

(B) Extramural

(a) Outcomes of participation (educational)

(b) Limitations in participation.

(c) Selection and training of teams.

(d) Participation, finances and other aspects .

(C). Public Relations

(a). Definition and need.
(b). Principles of public relations in physical educations.
(c). Techniques, sue of media
(d). Relations with parents, public and other bodies.
(e). Demonstration, displays on special occasions

Unit V

Office management and budget

(a). Maintenance of records
(b). Office Correspondence, filing and reports.
(c). Physical education budget and it's preparation
(d). Income & expenditure (sources)
(e). Maintenance of accounts.
(f). Petty cash.

References:

1. Joseph ,P.M Organisation of physical education , The old students association TIPE Kanotvali (bombay).1963.
2. Voltmer ,E.F.et al The organisation and administration of physical education , prentice hall inc., New Jersey , 1979.
3. Bucher ,C.A.Administration of Physical Education and atheletic programmes , The C.V.Mosby Co. London 1983.
4. Zeigler ,E.R. and Bowie G.W Management Competency Development in Sports and Physical Education , Lea and Febiger, Philadelphia ,1983.
5. Maheshwari ,B.L.Managaement by Objective , Tata Mc.Graw -Hill. Publishing Co. Ltd. New Delhi 1982.
6. ALen L.A.Management and Organisation , McGraw -Hill Book Co. Inc. London 1958.
7. Newman W.H. Administrative Action, Prentice Hall Inc. New Jersey ,1963.
8. Huges , W.R.etal Administration and physical Education. The Ronald Press Co. New York 1962.

B.P.E.S. SEMESTER V

GYM MANAGEMENT AND FITNESS TRAINING

Unit – I : Introduction

a. Concept of a Gym / Health Club (Basic Facilities)
b. Equipments for modern gym (Strength Section, Cardio Section, Floor Exercise Section)
c. Sauna and Steam Therapy
d. Concept of SPA

Unit –II : Gym Management

a. Staffing Pattern of a Gym
b. Budget Preparation
c. Various Programs
d. Pre and Post Training Testing
    a. Cardio-Respiratory Endurance
    b. Muscular Endurance
    c. Muscular Strength
    d. Musculoskeletal Flexibility

Unit – III : Nutrition

a. Nutrition and Nutritional Supplements
b. Calculating calories of intake and output
c. Preparing a diet chart
d. Role of various nutritional products

Unit – IV : Strength Training

a. Exercise for developing
    i. Chest Muscles
    ii. Back Muscles
    iii. Shoulder Muscles
    iv. Arm Exercise
    v. Abdominal Muscles
    vi. Thigh Muscles
    vii. Calf Muscles

Unit – V : Obesity and Weight Control

a. Overweight and obesity
b. Methods of assessing body fat
c. Principles of fat reduction program
d. Exercise for controlling fat

References:

1. Arnold Schwarzenegger; The New Encyclopedia of Modern Body Building. Fireside Rockefeller, 1230 Avenue of the Americas , 2002
2. Thomas, R Baechle, Fitness Weight Training, Human Kinetics, 2001
3. Bian, F.C. Hand Book of Food and Nutrition; Bikaner Agro Botanical Publishers, 4 E - 106 J.N.Vyas Nagar , 1999
4. Gupta, K ; Food and Nutrition. New Delhi: Jaypee Brothers, 1984
5. Foster, E.R and Hartinger, Karyn; Fitness Fun. Champaign: Human Kinetics, 1992
6. Miller, David K. and Allen , T Earl; Fitness A lifetime Commitment. Delhi: Surjeet Publication, 1982
7. Uppal A.K. ; Physical Fitness How to Develop. Delhi : Friends Publications, 1992
8. Williams, Melvin; Lifetime Fitness and Wellness. Boulevard Dubuqur : Wm .C. Broun , 2001

B.P.E.S. SEMESTER V

CRICKET SPECIALIZATION

1. Introduction of the game and historical development with special reference to India.

2. Important tournaments held at national and International levels and distinguished personalities related to the game.

3. National and International bodies, controlling the sports/game and their function

4. Fundamental Skills.
   a. Batting
      (i) Forward defensive stroke
      (ii) Backward defensive stroke.
   b Bowling
      (i) Simple bowling
   c. Fielding
      (i) Defensive fielding –Orthodox, Unorthodox.
      (ii) Offensive Fielding.
   d. Catching
      (i) High Catching
      (ii) Low Catching
   e. Stopping and throwing techniques.
   f. Wicket keeping technique.

5. Advanced Skill
   a. Batting
      (i) Forward defensive stroke
      (ii) Backward defensive stroke
      (iii) Forward off drive
      (iv) Forward on drive.
   b. Bowling.
      (i) Simple bowling techniques.
      (ii) Difference between pace.
      (iii) Bowling and spin bowling: Off and leg spin bowling.
   c. Fielding: Different techniques of fielding and its importance.
   d. Catching: Different types of catching, its techniques and importance.
   e. Stopping and throwing: Different techniques and its importance.
   f. Wicket Keeping: Different techniques and their implications.

6. Rules and their interpretations and duties of officials.

References:

- Micharda ,Barry ,Barry Richard Cricket London Pelhon Books, 1979.
- Mankar , Vinno, How to play Cricket. Rupa and Company, 1976.
- Greig ,Tony , Greug in Cricket .Bombay, S. Publication, 1975.
- John Snow ,Cricket Fondon : William Dusmomby Publisher Ltd. 1973.

B.P.E.S. SEMESTER V

BADMINTON SPECIALIZATION

Unit I - History of Badminton

(a) In India
(b) In Asia
(c) In World

Unit II – Laws of Badminton

(a) Laws of Badminton with interpretations.
(b) Recommendations to technical officials and their duties.
(c) Terminologies in badminton

Unit III – Fixture/Draw in Badminton

(a) Fixture for inter collegiate Badminton Competitions.
(b) University – Zonal and All India University Tournaments

Unit IV – Fundamental Skills

(a) Racket and Shuttle Grips
(b) Services and Rallies
(c) Forehand and backhand stokes – smash over and clear drops under arms clear drive and net shot.
(d) Basic footwork

Unit IV - Basic Tactics Strategy

(a) Singles – Systems of Play
(b) Doubles – Systems of Play
- Front and Back
- Side by Side
- Rotation

Unit V - warming up

(b) Specific Exercises of warm up and conditioning.
(a) General and Specific warm up.
(c) Fundamental training drills in Badminton.

References:

Jake Downey, Badminton for Schools.

B.P.E.S. SEMESTER V

ATHLETICS SPECIALIZATION

Unit – I **History**

a. Historical review of various athletic events (up to 2000)

b. Historical review of various sports awards to athletes (up to 2000)

Unit –II **Federation and Tournaments**

a. IAAF Council and committees

b. International Competitions

Unit – III **Training Methods**

a. Warming –up

b. Training Loads

Unit – IV **Skills and Techniques**

a. Crouch Start

b. Triple Jump

c. Fosbury Flop technique of High Jump

d. Hitch kicks technique of Long Jump

e. Scientific basis of above techniques

Unit – V **Officiating Playfields and Equipments**

a. Basic rules of sprints, Long Jump, High Jump, and Triple Jump.

b. Mechanics of Officiating All track Events, Walking and Road races (Marathon and Half Marathon)

c. Equipment and specifications of all track related equipments

d. Layouts and maintenances of all track events.

B.P.E.S. SEMESTER V

GYMNASTICS SPECIALIZATION

Unit-I **History of Gymnastics in world:- Earliest History & Middle age.**

A Brief History of Greek, Sweden, Denmark Germany, France.

Unit - II

A Organization of : F.I.G.

B Value of gymnastics, how gymnastics can be popularize in India.

Unit - III **Training Methods**

A Warming up (General and specific)

B Training load.

Unit - IV **Techniques:**

Teaching of Advance skills and techniques (at least three on each apparatus)

A Specification of apparatus used for men and women.

B Lay out and maintenance of gymnasium.

Unit - V

A Purpose and goal of code of points

B Evaluation of the Exercise.

B.P.E.S. SEMESTER V

HOCKEY SPECIALIZATION

Unit I - Origin of Hockey -
Ancient hockey, modern hockey, hockey in India.

Unit II - History of Major International and National Hockey Championships
a. World Cup Hockey, Olympic Games, Championship trophy and Asia Cup.
b. Rangaswami Cup, Benghton Cup.

Unit III - Basic and Advance Skills of Hockey -
(a) Rolling, Pushing, Hitting and Stopping.
(b) Dribbling, Receiving, Flick, Scoop, Dodging and Tackling.

Unit IV - Meaning of Sports Training. Definition of Sports Training, Aims of Sports Training, Objectives of Sports Training, Characteristics of Sports Training, Principles of Sports Training.

Unit V-
(a) Drills and Test in Hockey.
(b) Construction, layout and maintenance of playfields & equipments.

B.P.E.S. SEMESTER V

FOOTBALL SPECIALIZATION

Unit – I: History of football (National and International)

Unit – II: Organization of federation and association
(District, State, National and International)

Unit –III: Techniques

a. Advance skill and techniques
b. General mechanical principals applied to skill techniques

Unit –IV: Rules and their interpretations

Unit –V: Layout and maintenance of playfields and equipments

B.P.E.S. SEMESTER V

GAMES (PRACTAL)

TABLE TENNIS AND KABADDI

Common syllabus all games

Unit- I. History of game, Federations and Competitions.

Unit- II. Rules and their interpretation.

Unit- III. Fundamental and Advance skills.

Unit- IV. Equipments and their specification and maintenance.

Unit- V. Layout and maintenance of playfields

BPE SEMESTER VI

TEST AND MEASUREMENT IN PHYSICAL EDUCATION

Unit I : Introduction

(1) Meaning of Test, Measurement and Evaluation .Need and Impotence of Test and Measurement and Evaluation in Physical Education.
(2) Meaning of Statistics, Need and Importance of Statistics.
(3) Meaning of Data .Kinds of Data.
(4) Frequency Table – Meaning construction and uses .Population and sample. Sampling techniques – importance and principles.

Unit II: Fundamentals of Statistics

(1) Measures of Central Tendency –Meaning uses and calculations from frequency tables.
(2) Measures of variability –meaning uses and calculations.
(3) Graphical representation of Data.
(4) Percentile Meaning, uses and calculations.
(5) Correlations – Meaning, uses and calculations.

Unit III: Test and Evaluation and Construction

(1) Knowledge Test. Importance and Types
(2) Items to be included in objective and subjective knowledge tests
(3) Criteria of test selection

Unit IV: Measurement of Health Status

(1) Measurement of nutritional status (subjective and objective.)
(2) Somatotyping- A brief account of kretchmer`s and Sheldon`s body types.

Unit V: Measurement of Social Efficiency, Physical Fitness and Skill Performance

(1) Sports Skill Tests
(a) Lockhart and Mcpherson Badminton Test.
(b) Johnson Basketball Ability Test.
(c) McDonald Soccer Test.
(d) Brady Volleyball Test.
(e) Dribble and Goal Shooting Test in Hockey.
(2) Fitness Tests –Roger`s PFI, AAHPERD Youth Fitness Test, Indiana Motor Fitness Test, JCR Test and Kraus –Weber Test.

Reference:

1. Clarke ,H.H. Application of Measurement to Health and Physical Education, Englewood Cliffs, N .J.: Prentice Hall Inc.
2. Larson ,L. A. and Yacom ,R.D. Measurement and Evaluation in Physical ,Health and Recreation Education .St. Louis :C.V. Mosby Company 1957 .
3. Mathews. Donald K. Measurement in Physical Education ,London : W .B. Saunders Company, 1973.
4. Nelson, N.P. : An Elementary course in Statistics ,Test and Measurement in Physical Education and Educational Tests Polo Alth, 1960.

BPE SEMESTER VI

CORRECTIVES AND REHABILITATION IN PHYSICAL EDUCATION

Unit I:

(a) Meaning and scope of "Correctives" in Physical Education.

(b) Posture and its deviation :

(1) Definition, Standards of standing posture values of good posture, causes and drawbacks of bad posture.

(2) Common postural deviations, their causes and remedial exercises :

(a) Kyphosis (b) Scoliosis (c) Lordosis

(d) Knock Knees (e) Bowlegs (f) Flat – feet.

(3) Organization of a corrective-Gymnastic Class (Group theory) and its advantages.

Unit II:

(a) (1) Scope of Sports injuries in Physical Education.

(2) Hazards of Incomplete treatment.

(b) Prevention of injuries:

(1) Factors predisposing the sports injuries.

(2) General principles regarding the prevention of injuries.

(c) Common sports injuries and their immediate treatment:

(1) Contusion (2) Abrasion (3) Laceration

(4) Sprain (5) Strain (6) Haematoma

(7) Fracture (8) Dislocation.

Unit III: Rehabilitation

(1) Definition aims and objectives and scope and rehabilitation.

(2) Goals of rehabilitation.

(3) An introduction of effects and uses of Therapeutic Modalities in rehabilitation.

(a) Cold Therapy (b) Infra Red Radiation

(c) Contrast Bath (d) Wax Bath Therapy

(e) Hydrotherapy (Exercises under water).

Unit IV:

(A) Therapeutic Exercises

(1) Definition and scope of Therapeutic Exercises in Athletic injuries.

(2) Classification, Physiological effects and uses of the following:

(a) Active Exercise (Free, Assisted and Resisted, Movements).

(b) Passive Exercises (Relaxed and forced movements).

(3) An introduction to progressive resistance exercises method.

(B) Techniques of Therapeutic Exercises:

(a) Muscles Strengthening Exercises.

(b) General Principles of Muscle Strengthening.

(c) Manual-Muscle testing: A Method of assessing Muscle-strength.

1. Stretching and Mobilizing Exercises : Factors causing Limitation of joint Range, General mobilizing methods, and practical demonstration of exercises to mobilizing the shoulder, elbow, wrist, hip knee, ankle and foot.

2. Testing of common soft tissue tightness or contractures and suitable exercises to stretch them.

Unit V: Therapeutic and Sports Massage

(1) Definition and brief history of massage and remedial exercises.
(2) General approach to a Massage Manipulation.
(3) Common Physiological effects of Massage.
(4) Common Massage Manipulations used in sports and Athletics and their therapeutic uses.
(5) Contra – indications of massages in general.
(6) Techniques of Massage for the limbs, back and neck.

Books Recommended:

1. First Aids to the Injured, New Delhi , St. John Ambulance Association.
2. Johnson, W.R. and Buskirk, E.R. "Science and Medicine of Exercise and Sports" , New York, Harper and Row , 1974.
3. O'Dongho D. "Treatment of Injuries to Athletes", Philadelphia : W.B. Sounders and Company
4. Pande, P.K. Gupta, L.C. : 'Outline of sports Medicine', New Delhi Jaypee Brothe, 1987.
5. Reilly Thomas : 'Sport Fitness and sports Injured', London, Faber and Faber Ltd. , 1981.
6. Strauss, R.H. : 'Sports Medicine', Philadelphia, W.B. Saunders Co. , 1984 .
7. Steyen Roy, Devin Richard : ' Sports Medicine, Engle wood cliffn N.J. : Prentice Hall, 1983.
8. Colson John, Progressive Exercise Therapy, Bristol John Wright and sons Ltd. 1969.
9. Danies and worthingham : Muscle Testing : Techniques of Manual Examination, Philadelphia, W.B. Saunders Co.
10. Forster, Palastangas : 'Clayton's Electrotherapy' Delhi CBS Publishers and Distributors.
11. Gardiner M. Dena : 'The Principles of Exercise Theraph' : London : Bell and Hyman, 1981.
12. Kessler Henry H. : The Principles and Practices of Rehabilitatin, Philadelphia, lea and Febiger, 1950.
13. Rathbone J.L. , 'Corrective Physical Education' , London, W.B. Saunders Co.
14. Wood and Backer, Board, Massage : Philadelphia : W.B. Saunders Co.
15. Yllery J. and Cash M. Sports Massage : London : stanty Paul and co. 1988.

BPE SEMESTER VI

CRICKET SPECIALIZATION

Unit - I

Rules and their interpretations.

Unit - II

(A) Standard one day and Twenty- Twenty and Test Match Playing Conditions.

(B) All advance skills.

Unit - III

Officiating – Duties of Umpires, Referees and Scorers -

(A) Before the Match.
(B) During the Match.
(C) During the intervals.
(D) Joint Desiccation.
(E) After the Match.

Unit - IV

Lay out, construction and maintenance of cricket field and markings.

Unit - V

Study of the personalities

(A) Sunil Gavaskar
(B) M.S. Dhoni
(C) Sandhya Agarwal
(D) Ajit Wadekar
(E) B. Bedi

References:

1. Frank Tyson, Manual for cricket coaching.
2. Tom Smith umpiring and scoring
3. E.B. Elbloria Cricket Coaching.

BPE SEMESTER VI

BADMINTON SPECIALIZATION

Unit I- **Awards and Personalities**

(a) Awards- Rajiv Gandhi Khal Ratna, Padma Shri, Arjuna Award, Dronacharya Award.

(b) Prakash Padukone, Gopichand, Dinesh Khanna, Nanda Natekar, Syed Modi, Ani Ghia, Meena Shah, Mohmmad Arif.

Unit II- **Management**

(a) Construction of Badminton Hall.

(b) Court marking and its maintenance

(c) Flooring, height, lighting system, space around courts surroundings and umpire's chair.

Unit III- **Officiating in Badminton**

(a) Fixtures for District/State/National/International Open Tournaments.

(b) Instructions for filling up the score sheet for singles, doubles and mixed doubles.

Unit IV- **Advanced skills**

(a) Round the Head stroke, clear, smash and drop.

(b) Jump Smash, Half and sliced Net dribble.

(c) Advanced Footwork.

Unit V- **Tactics and Strategy**

(a) Mixed Doubles

(b) Lead up Games, Recreation Games in Badminton.

References:-

1. Jake Downey, Better Badminton for All.

BPE SEMESTER VI

ATHLETICS SPECIALIZATION

Unit – I: History

a. Historical review of various athletic events (after 2000)
b. Historical review of various sports awards to athletes (after 2000)

Unit – II: Federation and Tournaments

a. Anti – Doping Rules
b. Prohibited Agents
c. Procedure of Testing

Unit – III: Training Methods

a. Training of Speed
b. Training of Endurance
c. Training of Strength

Unit – IV: Skills and Techniques

a. Techniques of shot-put
b. Technique of Discus throw
c. Technique of Javelin Throw
d. Techniques of Baton exchange
e. Theoretical concepts of techniques of Hammer Throw and of Pole Vault
f. Scientific basis of above techniques

Unit – V : Officiating Playfields and Equipments

a. Basic rules of Relay Race, Shot-put and Discus throw, Javelin Throw, Hammer throw and Pole Vault.
b. Mechanics of Officiating All throws, Pole Vault and Relay Races.
c. Equipment and specifications of all throws, pole vault and relay races related equipments.
d. Layouts and maintenances of all Field events.

BPE SEMESTER VI

GYMNASTICS SPECIALIZATION

Unit - I

A History of gymnastics in India.

B Brief History of France, U.S.S.R., England, U. S.A.

Unit - II

A Organization of : G.F.I.

B Safety and spotting techniques.

Unit - III Training Methods

A Training of strength.

B Training of speed.

C Training of Endurance.

D Training of Feasibility.

E Training of coordinative abilities.

Unit - IV General mechanical principles applied to skills/techniques.

Unit - V

A Competition I, II & III.

B Table of general faults & penalties.

C Regulations for judge's structure, composition and function of juries.

BPE SEMESTER VI

HOCKEY SPECIALIZATION

Unit I- Organizations:

(a) I.H.F. structure and functions.

(b) F.I.H. structure and functions.

Unit II (a) Fitness and Coaching in Hockey.

(b) Skill acquisition.

(c) System of Play.

Unit III- Mechanical and muscular analysis of skills

Unit IV- Mechanics of officiating.

Unit V- Rules and their interpretation.

BPE SEMESTER VI

FOOTBALL SPECIALIZATION

Unit - I Organization

a. FIFA structure and function
b. AIFF structure and functions

Unit – II Training Method

a. Warming up (General and Specific)
b. Training load
c. Training as motor qualities (General)

Unit – III Tactics

a. Advance skill and tactics

Unit- IV Basic and advance skill of football

a. Various types of receiving
b. Various types of kicking
c. Throwing in
d. Dribbling

Unit-V

a. Fitness and coaching in football
b. System of play

BPE SEMESTER VI

GAMES (PRACTAL)

KHO-KHO AND TENNIS

Common syllabus of games

Unit- I. History of game, Federations and Competitions.

Unit- II. Rules and their interpretation.

Unit- III. Fundamental and Advance skills.

Unit- IV. Equipments and their specification and maintenance.

Unit- V. Layout and maintenance of playfields

Bachelor of Social Work (BSW)
Department of Social Work
A.P.S. University, Rewa (M.P.)
Programme Structure
(As per NEP 2020 and CBCS Ordinance 14 (A)

EXAMINATION SCHEME

Ist Year

S.No.	Paper Name	Theory		Internal Assessment		Total Max. Marks	Credits
		Max.	Min.	Max.	Min.		
	Semester - I						
1.	Paper - 101 **(Major Core)** Foundations of Social Work	60	21	40	20	100	6
2.	Paper – 102 **(Minor Core)** Psychology and Social Work	60	21	40	20	100	6
3.	Paper – 103 **(Generic Elective (GE)*** Introduction to Contemporary Indian Society	60	21	40	20	100	4
4.	Paper – 104 **(Ability Enhancement Course) (AEC)** Hindi Language	60	21	40	20	100	4
Semester Total						**400**	**20**
Cumulative Total						**400**	**20**
	Semester - II						
1.	Paper - 201 **(Major Core)** Social Case Work	60	21	40	20	100	6
2.	Paper – 202 **(Minor Core)** Social Science Concepts and Social Work	60	21	40	20	100	6
3.	Paper – 203 **(Generic Elective (GE)*** Community Psychology	60	21	40	20	100	4
4.	Paper – 204 **(Ability Enhancement Course) (AEC)** Environmental Studies	60	21	40	20	100	4
Semester Total						**400**	**20**
Cumulative Total						**800**	**40**

* Students may choose this course as a Generic Elective or may choose a Generic Elective Course offered in other UTDs at the same level or may choose offered by MOOCs through SWAYAM.

The student will be awarded Certificate in Bachelor of Social Work (CBSW) on successful completion of first year.

Department of Social Work
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B.S.W. Semester: **I**

Subject: Paper - 101 **(Major Core) Foundations of Social Work**

Course Objectives

1. To understand history and evolution of social work profession, both in India and the West.
2. To develop insights into the origin and development of ideologies and approaches to social change.
3. To develop Skills to understand contemporary reality in its historical contest.
4. To understand of Gandhian Philosophy.

Learning Outcomes

1. Able to understand social work as a profession.
2. Able to understand various ideologies of social work.
3. Able to demonstrate awareness of values and ethics of the social work profession.

Unit - I

An Introduction to Social Work

1. Social Work: Concept, Meaning, Definition and Objectives
2. Social Work: Nature, Scope and Functions
3. Emergence of Social Work: UK, USA, India

Unit - II

Gandhian Philosophy of Social Work

1. Gandhian Philosophy of Social Work
2. Salient Features of Gandhian Thought
3. Gandhian Values and Concept of help

Unit - III

Values and Ethics in Social Work Practice

1. Assumptions and Values of the Social Work
2. Codes of Ethics
3. Principles of Social Work

Unit - IV

Social Work Profession in India

1. Profession: Meaning Definition and Attributes
2. Professionalization of Social Work in India
3. Issues and Challenges before Social Work Profession

Unit - V

Approaches and Ideologies

1. Professional v/s Voluntary Approaches to Social Work
2. Ideology of Action Groups and Social Movements
3. Generalist Approach Groups and Social Movements

Key Words: Social Work, Values and Ethics, Philosophy, Professional Attributes and Social Work Practice.

References:

- Annie Pullen-Sansfacon (2003), The Ethical Foundations of Social Work, Stephen Cowden Routledge.
- Banks, S. (1995), Ethics and Values in Social Work: Practical Social Work Series, London: Macmillan Press Ltd.
- Compton, B.R. (1980), Introduction to Social Welfare and Social Work. Illinois: The Dorsey Press.
- Desai, Murli, (2006), Ideologies and Social Work: Historical and Contemporary Analyses, Rawat Publication, New Delhi.
- Friedlander, Walter A. (1977) Concepts and Methods of Social Work, New Delhi: Prentice Hall of India Pvt. Ltd.
- Heun, Linda R., Heun, Richard E. (2001) Developing Skills for Human Interaction, London: Charles E. Merrill Co.
- Jacob, K.K. (Ed.) (1994) Social Work Education in India - Retrospect and Prospect Udaipur, Himansu Publications.
- Joseph, Sherry (Ed.) (2000) Social Work: In the Third Millennium (Some Concerns and Challenges), Sriniketan, Department of Social Work, Visva-Bharati.
- National Association of Social Workers. (2008) Coce of Ethics of the National Association of Social Workers. Washington, D.C.: NASW Press.
- O' Hagan, Kieran, Kingsley, Jessica (2003) Competence in Social Work Practice - A Practical Guide for Professionals, London.
- Reamer and Fredric (2005) Social Work Values and Ethics, New Delhi: Rawat Publication.
- Singh, D.K. and Bhartiya, A.K. (2010) Social Work: Concept and Methods. Lucknow: New Royal Book Company.
- Skidmore, Rex A. (1982), Introduction to Social Work, New Jersey, Thackeray, Milton G. Prentice-Hall, Englewood Cliffs.
- Surendra Singh (Chief Editor). (2012): Encyclopedia of Social Work in India. Lucknow: New Royal Book Company.

Department of Social Work
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B.S.W. Semester: **I**

Subject: Paper – 102 **(Minor Core) Psychology and Social Work**

Course Objectives

1. To understand psychological concepts and its relevance to Social Work.
2. To understand determinants and processes of Personality Development.
3. To understand the basic concepts and processes in social psychology and its relevance to Social Work.
4. To understand Social Attitudes and Social Cognition.
5. To understand Psycho-Social Behaviour.

Learning Outcomes

1. Able to understand psychological concepts and its relevance to Social Work.
2. Able to understand determinants and processes of personality development.
3. Able to understand the basic concepts and processes in social psychology and its relevance to Social Work.
4. Able to understand social attitudes and social cognition.
5. Able to understand psycho-social behaviour.

Unit - I

Introduction to Psychology

1. Psychology Concept, Definition and Relevance to Social Work.
2. Motivation and Learning: Meaning and Definition of Learning, Concept and Factors, Affecting Motivation.
3. Emotion and Intelligence: Concept, Factors, Affecting Emotion and Intelligence.

Unit - II

Human Growth and Personality

1. Human Growth and Development Meaning and Stages.
2. Personality: Concept and Determinants.
3. Theories of Personality, Freud, B.F. Skinner and Carl Rogers.

Unit - III

Introduction to Social Psychology

1. Social Psychology: Concept, Definition and Relevance to Social Work.
2. Group: Concept Meaning and Definition Influence of Groups on Individual Behaviour.
3. Social Influence and Interpersonal Attraction: Definitions Features and Factors.

Unit - IV

Social Attitude and Social Cognition

1. Social Attitude: Meaning, Definition Features and Formation.

2. Perception, Social Perception - Meaning and Concept, Self Concept and Self Esteem.
3. Social Cognition: Definition Feature, Stereotypes and Prejudices.

Unit - V

Collective Behaviour

1. Collective Behaviour: Characteristics and Dynamics.
2. Leadership: Meaning, Definition, Traits and Functions.
3. Public Opinion and Propaganda.

Key Words: Psychology, Human Growth, Personality, Collective Behaviour, Public Opinion, Perception and Social Attitude.

Reference:

- Atkinson, R. L., Atkinson, R. C., Smith, E. E., Bem, D. J. and Hilgard, E. R. (2013). Introduction to Psychology. New York: H. B. J. Inc.
- Baron, R.A. and Byron, D. (1998). Social Psychology. New Delhi: Prentice Hal.
- Dandapani, S. (2005). General Psychology. Hyderabad: Neel Kamal Publications.
- Elizabeth, H. (1968). Development Psychology. New York: Mc Graw Hill.
- Feldman, R.S. (1985). Social Psychology: Theories, Research and Applications. New York: McGraw hill.
- Feldman, R.S. (1997). Understanding Psychology. New Delhi: Mc Graw Hill.
- Hall, C.S. Lindzey, G. and Cambell J.B. (2004). Theories of Personalities. New York: Wiley M.
- Kuppuswamy, B. (1972). Elements of Social Psychology. New York: Asian Publishing House.
- Morgan, C.T., King, R.A. Weisz, J.R., Schopler, J. (2001). Introduction to Psychology. New Delhi: Tata McGraw and Hill.
- Myers, D.G. (2005). Social Psychology (8th ed.). New Delhi: Tata McGraw Hill Pub. Co. Ltd.

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B.S.W. Semester: **I**

Subject: Paper – 103 **(Generic Elective (GE)* Introduction to Contemporary Indian Society**

Course Objectives

1. To understand History evolution of Indian Society.
2. To understand basic Various Concept of Society.
3. To understand Skills to understand Concept of Social System.
4. To understand essential Elements of Society.

Learning Outcomes

1. Able to understand Indian Society.
2. Able to understand Various Social Groups and Institution.
3. Able to demonstrate Awareness of Social System and Elements of Society.

Unit - I

Conceptual Perspectives of Society

1. Society: Meaning, Definition, Nature, Types, Function
2. Historical Development of Society: Vaidic Period, Mughal Periods, Modern Period.
3. Demographic Profile of Indian Society.
4. Theories of Society.

Unit - II

Basic Understanding of Social Groups and Social Institutions

1. Social Group: Meaning, Definition, Characteristics, Importance.
2. Types of Group: Primary Group, Secondary Group, Reference Group.
3. Social Institution: Meaning, Definition, Characteristics, Importance.
4. Social Institutions: Family, Marriage, Education, Religion, Property.

Unit - III

Units of Society

1. Social Norms: Meaning, Definition, Characteristics and its Role in Society.
2. Classification of Social Norms: Culture, Traditions, Folkways, Customs, Mores.
3. Community: Meaning, Definition, Characteristics and Importance.

Unit - IV

Concepts of Social System

1. Social Stratification: Concept, Importance and Forms.
2. Status and Roles: Meaning, Definition, Characteristics, Importance.
3. Caste, Class, Race, Social Mobility: Meaning, Definition, Characteristics and its Role in Society.

4. Social Structure: Meaning, Definition, Characteristics.

5. Social System: Meaning, Definition, Characteristics, Structure and Funtion.

Unit - V

Essential Elements of Society

1. Social Process: Meaning, Definition, Characteristics, Importance.

2. Forms of Social Process: Cooperation, Accommodation, Assimilation, Competition and Conflict.

3. Social Control, Concept, Means and Types.

4. Social Change: Meaning, Definition, Characteristics, Types.

5. Socialization, Sanskretization, Westernization, Modernization, Globalization, Liberalization Privatization.

6. State Meaning, Element, Role and Functions.

7. Concept of Welfare State and Present Trend of Democracy.

Keywords/Tags: Society, Social Group, Social Institutions. Community, Social Organization, Social Structure, Social System, Social Stratification, Social Control, Social Change.

Reference:

- Ahuja Ram: Social problems in India (Jaipur, Rawat Publication 1992)
- Bhusan, Vidya and Sachdev (2006) An introduction to sociology. Allahabad, KitabMahal.
- Davis, K: ManavSamaj (Allahabad: Kitab Mahal-1973)
- Gupta, M.L.: SamajShastra (Agra: SahityaBhavan Publication, 2021)
- Harry. M, Johns (1993) Sociology: A systematic introduction. Chennai: Allied Publications
- Horton, P.S. and Hunt, C.L., (2005) Sociology, New Delhi: Tata McGraw Hill
- Johnson, H.M.: Sociology A Systematic Introduction (Bombay: Allied Publishers)
- Mac Iver and Page: Society- An Introductory Analysis (London-Mac Millen 1955)
- Madan, G.R.: Indian Social problem, Vol. 1 and 2
- Shankar, Rao CN: Sociuology (S Chand and Company, New Delhi 2006)

2. Suggestive digital platforms web links

1. http://www.egyankosh.ac.in/handle/123456789/17065

2. http://www.ignouhelp.in/ignou-bsw-study-material/

3. http://www.rahul-edr.org/pdf/Self-Learning-Materials/Course-2.pdf

4. http://egyankosh.ac.in/handle/123456789/2418

5. https://www.slideshare.net/DrJBalamuruganiPhD/social-stratification-30789892

6. https://www.yourarticlelibrary.com/sociology/social-processes-the-meaning-types-characteristics-of-social-processes/8545

7. http://cmcldp.org/userfiles/Book%20-%20 Introduction%20to%20social%20work(2).pdf

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B.S.W. Semester: **I**

Subject: Paper – 104 **(Ability Enhancement Course) (AEC)** Hindi Language

ikB~;Øe dk mnn~s';&

1- bl v/;;u ds mijkar vki Hkk"kkvksa esa 'kCn oxksZ vkSj O;kdjf.kd dksfV;ksa esa foHksn dh fLFkfr;ksa ls ifjfpr gksxsaA

2- ikfjHkkf"kd 'kCnkoyh ds ifjHkk"kkvksa dh tkudkjh izkIr djsxsaA

dkslZ vf/kxe miyfC/k ¼yfuZx vkmVde½

1- mRd`"V lkfgfR;d ikBksa ds v/;;u ls :fp dk fodkl djukA

2- fgUnh Hkk"kk dk O;ogkfjd KkuA

3- Hkk"kk&KkuA

4- lkekU; 'kCnkoyh vkSj fo'ks"k 'kCnkoyh ds v/;;u }kjk Hkk"kk ,oa laLd`fr cks/k dk fodkl djukA

5- fof'k"V 'kCnkoyh ¼cht 'kCn@dh oMZ½ ls ifjfpr djokrs gq, cks/k ds Lrj dks fodflr djukA

6- izfr;ksxh ijh{kkvksa gsrq rS;kj djukA

7- vfHkO;fDr {kerk dk fodkl

<u>bdkbZ & 1</u>

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<u>bdkbZ & 2</u>

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Department of Social Work
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B.S.W. Semester: **II**

Subject: Paper - 201 **(Major Core)** Social Case Work

Course Objectives

1. To understand the individual, family and their problems and the social contextual factors affecting them
2. To understand Social Casework as a method of Social Work practice
3. To gain knowledge about the basic concepts, tools, techniques, processes and Skills of working with individuals
4. To develop an understanding of application of case work in diverse settings

Learning Outcomes

1. Able to demonstrate familiarity with Casework processes, tools and techniques and their application in Professional Social Work Practice.
2. Able to develop skills of Observation, Listening, Interviewing and Home Visits, Rapport Building, Resource Mobilization and Recording.

Unit - I

Introduction to Social Casework

1. Social Casework: Concept, Nature, Scope, Objectives and Importance
2. Historical Development of Social Casework
3. Components of Social Casework (Person, Place, Problem and Process)
4. Principles of Social Casework

Unit - II

Understanding Individuals and Problems

1. Individual: Nature and Needs
2. Problems Faced by Individuals and Families
3. Concept of Social Role, Functioning and Coping

Unit - III

Tools, Techniques and Skills of Social Casework

1. Casework Relationship, Use of Authority and Advocacy
2. Communication: Observation, Listening, Interviewing and Home Visits

3. Rapport Building and Resource Mobilization

4. Recording in Casework

Unit - IV

Approaches and Process of Social Casework

1. Task Centered Approach.

2. Social Psychological Approach.

3. Problem Solving Approach and Integrated approach.

4. Phases of Casework Process: Study, Assessment, Intervention, Termination, Evaluation and Follow-up.

Unit - V

Casework Practice in Different Setting

1. Medical, School.

2. Elderly care Homes.

3. Correctional and Rehabilitation Centres.

Key Words: Social Casework, Skills in Social Casework, Process and Approaches.

References:

- Aptekar, Herbert (1955) The Dynamics of Casework and Counselling, New York: Houghton Mifflin Co.
- Beistek, F.P. (1957). The Casework Relationship. Chicago: Loyola University Press.
- Fisher, J.(1978). Effective Casework Practice: an Eclectic Approach, New York: McGraw Hill.
- Fuster, J.M. (2005). Personal Counselling, Better Yourself Books, Mumbai, Eleventh Edition.
- Hamilton, G. (1956): Theory and Practice of Social Casework. New York: Columbia University Press.
- Hamilton, Gordon (2013) The Theory and Practice of Social Case Work, Rawat Publication, New Delhi
- Keats, Daphne (2002) Interviewing – A Practical Guide for Students and Professionals, New Delhi: Viva Books Pvt.Ltd.
- Mathew, G. (1992): An Introduction to Social Casework. Bombay: Tata Institute of Social Sciences.
- Pearlman, H H. (1957). Social Case Work: a Problem Solving Process. Chicago: University of Chicago.
- Rameshwari Devi, Ravi Prakash (2004) Social Work Methods, Practics and Perspectives (Models of Casework Practice), Vol. II, Ch.3, Jaipur : Mangal Deep Publication.
- Richmond, Mary (1970) Social Diagnosis, New York : Free Press

- Sainsbury, Eric. (1970). Social Diagnosis in Casework. London: Routledge and Kegan Paul.
- Skidmore, R.A. andThakhary, M.G. (1982): Introduction to Social Work. New Jersey: Prentice Hall.
- Timms, N. (1964): Social Casework: Principles and Practice. London: Routledge and Kegan Paul.
- Timms, N. (1972): Recording in Social Work. London: Routlege and Kegan Paul.
- Upadhayay, R K. (2003). Social Case Work: A therapeutic approach. Jaipur: Rawat• Publications.
- Werner, H.D. (1965): A Rational Approach to Social Casework. New York: Association Press.
- Younghusband, E. (1966): New Development in Casework. London: George Allen and Unwin.

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B.S.W. Semester: **II**

Subject: Paper - 202 **(Minor Core)** Social Science Concepts and Social Work

Course Objectives

1. To understand basic sociological concepts and notions of society.
2. To know the basic concepts of economics and structure of economy.
3. To understand the political framework for social welfare

Learning Outcomes

1. Able to understand the basic sociological concepts and notions of society.
2. Able to know the basic concept of economics and structure of economy.
3. Able to explore the knowledge about political framework in the context of social welfare.

Unit - I

Introduction to Sociological Concepts

1. Society, Man and Society and its Relationships.
2. Caste, Class, Power and Authority.
3. Social Values, Norms, Customs, Mores and Culture.

Unit - II

Social Group and Process

1. Social Groups: Primary, Secondary and Reference.
2. Social Institutions: Family, Marriage and Religion.
3. Social Process: Concept, Importance and Types.

Unit - III

Notions of Society

1. Social Change: Concept, Characteristics and Factors.
2. Social Control: Concept, Importance and Agencies.
3. Socialization: Concept, Importance and Agencies.

Unit - IV

Basics of Economics

1. Micro: Demand and Supply, Cost, Production, Revenue and Market.

2. Macro: National Income, Inflation, Money and Banking.

3. Economic System: Capitalist, Socialist and Mixed.

Unit - V

Introduction to Political Concepts

1. State: Origin, Concept and its Organs.

2. Concepts of Welfare State.

3. Fundamental Rights, Directive Principles of State Policy.

Key Words: Society, Social Institution, Economic System and Welfare State.

References:

- Ahuja ,Ram (1997) Social Problem in India, Rawat Publishers, Jaipur.
- Ali, A.F. Iman (1992) Social Stratification Among Muslim-Hindu Community, New Delhi : Commonwealth Publishers.
- Bhusan, Vidya & Sachdeva, D. R. (2000) An Introduction to Sociology, Allahabad : Kitab Mahal.
- Crawford, K. (2004). Social Work and human development: Transforming Social Work practice. Exeter: Learning Matters.
- Flippo, Osella and Katy, Gardner (2003) Contraventions to Indian Sociology, Migration Modernity and Social Transformation in South Asia, New Delhi : Sage Publication.
- Gandhi P. Jagadish (1982) Indian Economy – Some Issues, Institute of Social Sciences and Research, Vellore.
- Koutsoyiannis (2008), Modern Micro Economics, 2nd Edition, London: Macmillan Press Ltd.
- M.Adhikari, Managerial: Economics.
- Mahajan, G. (Ed.). (1998). Democracy, Difference and Social Justice. New Delhi: Cambridge University Press.
- Mohanty, Manoranjan (2004) Class, Caste, Gender – Readings in Indian Government and Politics, New Delhi: Sage Publication.
- Singh, Yogendra (1997) Social Stratification & Change in India, New Delhi: Manohar Publication.
- Srinivas, M.N. (1991) Indian Social Structure. New Delhi: Hindustan Publishing House.
- Stroup, H.H. (1960). Social Work Education – An Introduction to the Field. New Delhi: Urasia Publishing.

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B.S.W. Semester: **II**

Subject: Paper - 203 **(Generic Elective (GE)*** Community Psychology

Course Objectives

1. To understand the meaning and concept of Community Psychology.
2. To develop disciplinary knowledge, Experimental learning and critical thinking.
3. To understand social dynamics and community health problems.

Learning Outcomes

1. Understanding the role of Psychology in community development.
2. Developing an appreciation of the core values that guide Community Psychology and facilitate community functions.
3. Developing insights with respect to health promotion programs in communities, community programme for child and maternal health, for physically challenged and elderly people in the Indian context through case studies.

Unit - I

Introduction

1. Community Psychology-Definition, Types of communities- locality based and relational:
2. Models: Ecological level analysis of community, conceptual level model.
3. Historical development and Perspective of Community Psychology.

Unit – II

Core Values of Community Psychology

1. Individual and Family wellness: Sense of Community: Respect for Human Diversity,: Social Justice :Empowerment and Citizen Participation: Collaboration and Community Strengths.
2. Community Functions- Learning, Socialization, and Supportive Functions.

Unit – III

Community as setting for health promotion

1. Concept of community mental health,
2. Concept of prevention

3. Need and Process of community organisation and building for health promotion programming.
4. Maternal health, for physical challenged and old age in Indian context.

Unit – IV

Community Programme for:

1. Child and Maternal health, for physical challenged and old age in Indian context.
2. Mental health education

Unit – V

Interventions for Community Development and Empowerment:

1. Concept and Practice for community development and Empowerment
2. Case studies of community intervention programs by the governmental and non-governmental organizations in Indian context such as, rural panchayat programs, children's education, citizen right, self- help group, social accounting.

Key Words: Community Psychology, Empowerment, Mental Health, Social Justice

References:

1. Banerjee, A., Banerji, R., Duflo, E., Glenneske, R., and Khenani, S. (2006) Can Information Campaign start local participation and improve outcomes? A study of primary education in Utter Pradesh, India, World Bank Policy Research, Working Paper No. 3967.
2. Fetterman, D.M., Kaftarian, S.J. and Wandersman, A. (Eds) (1996) Empowerment Evaluation, New Delhi: Sage Publication.
3. Kloos B. Hill, J Thomas, Wandersman A, Elias, M.J. and Dalton J.H. (2012). Community Psychology: Linking Individuals and Communities, Wadsworth Cengage Learning.
4. Mishra. G. (Ed). (2010) Psychology in India, Indian Council of Social Science Research, Dorling Kindersley (India) Pvt. Ltd. Pearson Education.

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B.S.W. Semester: **II**

Subject: Paper - 204 **(Ability Enhancement Course) (AEC)** Environmental Studies

Course Objectives

1. To understand various aspects of life forms, ecological processes, and the impacts on them by the human during anthropogenic era
2. To develop empathy for all life forms, awareness, and responsibility towards environmental protection and nature preservation.
3. To build capabilities to identify relevant environmental issues.

Course Learning Outcomes

1. Understanding the role of Psychology in community development.
2. Developing the critical thinking for shaping strategies.
3. Will able to analyze the various underlying causes, evaluate the practices and policies, and develop framework to make inform decisions.

Unit – I

Basic concept of Ecosystem:

1. Definition of Ecology and Ecosystem
2. Structure of Ecosystem: producer, consumer and decomposer
3. Function: energy flow in ecosystem, food chain, food web, and ecological pyramids

Unit – II

Natural Resources and its exploitation

1. Different types of natural resources-Forest, Water, Mineral, Energy, Land - Uses and over exploitation and associated problems.

Unit – III

Biodiversity and its conservation:

1. Introduction- Meaning and Definition
2. Levels of Biodiversity- Genetic, Species, and Ecosystem Diversity
3. Biographical classification of India.

4. Value of Biodiversity- Consumptive use, productive use, social, ethical, aesthetic and option value.

Unit – IV

Pollution

1. Meaning, Definition and Causes
2. Air, Water, Soil, Noise, Thermal and Nuclear Hazard
3. Types of pollutants
4. Climate change, Acid rain, Global Warming, Ozone layer depletion and Greenhouse effect.

Unit – V

Social issue and the Environment:

1. Urban Problems related to energy
2. Water conservation:
    - Rain water harvesting
    - Water shed management

Key Words: Pollution, Environmental Legislation, Environmental Movement, Environmental programme and organization.

Reference:

- Singh, J.S., Singh, S.P. and Gupta, S.R., (2018) Ecology; Environment Science and Conservation, S Chand publishing, New Delhi.
- Divan, S. and Rosencranz, A. (2002) Environmental Law and Policy in India: Cases, Material and Status Oxford University Press, India, 2nd Edition.
- Odum, E.P. (1971) Fundamentals of Ecology", Philadelphia Saundres.
- Bharucha, E. (2014) Environmental studies" Universities Press India Pvt. Ltd. Hyderabad. (Hindi Edition also available).
- Kaushik, Anubha, Kaushik, C.P. Perspectives in Environmental Studies.

Bacholar of Social Work (BSW)

Department of Social Work

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EXAMINATION SCHEME

S.No.	Paper Name	External Assessment		Internal Assessment		Total Max. Marks
		Max.	Min.	Max.	Min.	
	Semester - I					
1.	Paper - I Introduction to Professional Social Work	70	25	30	11	100
2.	Paper – II Introduction to Contemporary Indian Society	70	25	30	11	100
3.	Paper – III Introduction to Sociology Elective	70	25	30	11	100
4.	Paper – IV Environmental Issues and Disaster Management	70	25	30	11	100
5.	Paper-V English Language					50
6.	Paper-VI Compressive Viva-Voce					100

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B.S.W. Semester: **I**

Subject: (Paper - I) Introduction to Professional Social Work

Unit - I

Conceptual Perspective of Social Work

1. Social Work- Meaning and Definition
2. Characteristics of Social Work
3. Philosophy of Social Work
4. Objectives of Social Work
5. Basic Assumptions and Misconceptions regarding Social Work Profession.

Unit - II

Historical Background of Social Work

1. History of Social Work in England
2. History of Social Work in U.S.A
3. History of Social Work in India

Unit - III

Basics of Social Welfare

1. Social Welfare- Meaning and Definition.
2. Objectives of Social Welfare.
3. Related Terms: Social Welfare, Social Welfare Service, Social Service, Social Security, Social Reform, Social Defense, Social Policy, Social Welfare Agencey: GOs and NGOs.

Unit - IV

Social Work as Profession

1. Meaning and Definition of Profession.
2. Social Work as Profession: Meaning and Characteristics.
3. Professional Social Work: Code of Ethics.
4. Principles and Values of Professional Social Work.
5. Skills and Techniques of Social Work.
6. Methods of Social Work.

Unit - V

Status of Professional Social Work

1. Relation of Social Work with Other Social Sciences.
2. Globalization and Social Work.
3. Role and Functions of Social Worker in Different Fields.
4. Role of Professional Associations in Social Work.
5. Status and Challenges of Social Work Education in India.
6. Challenges of Professionalization in India with reference to Social Work.

Keywords/Tags: Social Work, History of Social Work, Social Welfare, Social Work Profession.

Text Books, Reference Books, Other Resources

1. Suggested Readings:

1. Dasgupta Sugata, Towards a Philosophy of Social Work in India.
2. Friendlander, W.A. (1955) Introduction to Social Welfare, New Your, Prentice, Hall.
3. Gore, M.S. Social Work and Social Work Education.
4. Mishra, P.D. (2005) Social Work: Philosophy and Methods, Inter India Publications, New Delhi.
5. Sachdeva, Bharat Me Samaj Kalyan Prashasan, KitabMahal, Allahabad, 2010.
6. Shastri Rajaram, Samaj Kary, Uttar Pradesh Hindi Sansthan, Lucknow.
7. Titus Richards M - Commitment to Welfare, Ruskin House, London.

2. Suggestive digital platforms web links

1. http://www.ignouhelp.in/ignou-bswe-01-study-material/
2. http://www.egyankosh.ac.in/handle/123456789/17063
3. http://egyankosh.ac.in/handle/123456789/2070
4. http://www.egyankosh.ac.in/handle/123456789/17079
5. http://www.egyankosh.ac.in/handle/123456789/17106/1/Unit-3.pdf
6. http://kkhsou.ac.in/eslm/E-SLM-for-Learner/5th%20Sem/Bachelor%20Degree/BSW/HPSW/HPSW-3_-_with_changes_incorporated.pmd.pdf
7. https://www.slideshare.net/LIBINJOMATHEW/history-of-social-work-in-india
8. http://dsc.du.ac.in/wp-content/uploads/2020/04/BASIC-CONCEPTS-OF-SOCIAL-WELFARE-converted.pdf
9. http://cmcldp.org/userfiles/Book%20-%20Introduction%20to%20social%20work(2).pdf

Part D- Assessment and Evaluation		
Suggested Continuous Evaluation Methods: Maximum Marks : 100 Continuous Comprehensive Evaluation (CCE): 25 marks University Exam (UE) 75 marks		
Internal Assessment: Continuous Comprehensive Evaluation (CCE): 25	Class Test Assignment/Presentation	15 10

External Assessment: University Exam Section: 75 Time: 02:00 Hours	**Section (A) :** Three Very Short Questions (50 Words Each) **SEction (B) :** Four Short Questions (200 Words Each) **Section (C):** Two Long Questions (500 Words Each)	03 X 03 = 09 04X09= 36 02X15- 30 Total 75
Any remarks/suggestions:		

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B.S.W. Semester: **I**

Subject: (Paper - II) Introduction to Contemporary Indian Society

Unit - I

Conceptual Perspectives of Society

1. Society: Meaning, Definition, Nature, Types, Function
2. Historical Development of Society: Vaidic Period, Mughal Periods, Modern Period.
3. Demographic Profile of Indian Society.
4. Theories of Society.

Unit - II

Basic Understanding of Social Groups and Social Institutions

1. Social Group: Meaning, Definition, Characteristics, Importance.
2. Types of Group: Primary Group, Secondary Group, Reference Group.
3. Social Institution: Meaning, Definition, Characteristics, Importance.
4. Social Institutions: Family, Marriage, Education, Religion, Property.

Unit - III

Units of Society

1. Social Norms: Meaning, Definition, Characteristics and its Role in Society.
2. Classification of Social Norms: Culture, Traditions, Folkways, Customs, Mores.
3. Community: Meaning, Definition, Characteristics and Importance.

Unit - IV

Concepts of Social System

1. Social Stratification: Concept, Importance and Forms.
2. Status and Roles: Meaning, Definition, Characteristics, Importance.
3. Caste, Class, Race, Social Mobility: Meaning, Definition, Characteristics and its Role in Society.
4. Social Structure: Meaning, Definition, Characteristics.
5. Social System: Meaning, Definition, Characteristics, Structure and Funtion.

Unit - V

Essential Elements of Society

1. Social Process: Meaning, Definition, Characteristics, Importance.

2. Forms of Social Process: Cooperation, Accommodation, Assimilation, Competition and Conflict.

3. Social Control, Concept, Means and Types.

4. Social Change: Meaning, Definition, Characteristics, Types.

5. Socialization, Sanskretization, Westernization, Modernization, Globalization, Liberalization Privatization.

6. State Meaning, Element, Role and Functions.

7. Concept of Welfare State and Present Trend of Democracy.

Keywords/Tags: Society, Social Group, Social Institutions. Community, Social Organization, Social Structure, Social System, Social Stratification, Social Control, Social Change.

Text Books, Reference Books, Other Resources

1. Suggested Readings:

1. Ahuja Ram: Social problems in India (Jaipur, Rawat Publication 1992)

2. Bhusan, Vidya and Sachdev (2006) An introduction to sociology. Allahabad, KitabMahal.

3. Davis, K: ManavSamaj (Allahabad: Kitab Mahal-1973)

4. Gupta, M.L.: SamajShastra (Agra: SahityaBhavan Publication, 2021)

5. Harry. M, Johns (1993) Sociology: A systematic introduction. Chennai: Allied Publications

6. Horton, P.S. and Hunt, C.L., (2005) Sociology, New Delhi: Tata McGraw Hill

7. Johnson, H.M.: Sociology A Systematic Introduction (Bombay: Allied Publishers)

8. Mac Iver and Page: Society- An Introductory Analysis (London-Mac Millen 1955)

9. Madan, G.R.: Indian Social problem, Vol. 1 and 2

10. Shankar, Rao CN: Sociuology (S Chand and Company, New Delhi 2006)

2. Suggestive digital platforms web links

1. http://www.egyankosh.ac.in/handle/123456789/17065

2. http://www.ignouhelp.in/ignou-bsw-study-material/

3. http://www.rahul-edr.org/pdf/Self-Learning-Materials/Course-2.pdf

4. http://egyankosh.ac.in/handle/123456789/2418

5. https://www.slideshare.net/DrJBalamuruganiPhD/social-stratification-30789892

6. https://www.yourarticlelibrary.com/sociology/social-processes-the-meaning-types-characteristics-of-social-processes/8545

7. http://cmcldp.org/userfiles/Book%20-%20 Introduction%20to%20social%20work(2).pdf

Suggested equivalent online courses:

Part D- Assessment and Evaluation
Suggested Continuous Evaluation Methods: Maximum Marks : 100

Continuous Comprehensive Evaluation (CCE): 25 marks University Exam (UE) 75 marks		
Internal Assessment: Continuous Comprehensive Evaluation (CCE): 25	Class Test Assignment/Presentation	15 10
External Assessment: University Exam Section: 75 Time: 02:00 Hours	**Section (A) :** Three Very Short Questions (50 Words Each) **SEction (B) :** Four Short Questions (200 Words Each) **Section (C):** Two Long Questions (500 Words Each)	03 X 03 = 09 04X09= 36 02X15- 30 Total 75
Any remarks/suggestions:		

Department of Social Work
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B.S.W. Semester: **I**

Subject: (Paper - III) Introduction to Sociology (Elective)

Unit - I

Emergence of Sociology

1. Tradition of Indian Thinking
2. Sociology

2.1 Meaning

2.2 Scope

2.3 Subject Matter

2.4 Nature

2.5 Importance

3. Development of Sociology
4. Job opportunities in Sociology

Keywords/Tags: Emergence of Sociology, Tradition of Indian Thinking. Development of Sociology, Importance of Sociology, Job opportunities in Sociology.

Unit - II

Basic Concepts:

1. Society
2. Relation between Individual and Society
3. Community
4. Institution
5. Association
6. Social Group
7. Status and Role

Keywords/Tags: Relation between Individual and Society, Social Group, Social Status, Association in Sociology.

Unit - III

Social Organization and Institution: (Concept, Emergence, Development, Forms and Challenges)

1. Family
2. Kinship
3. Marriage
4. Caste, Class and Power
5. Race

Keywords/Tags: Social Organization, Social Institution, Kinship, Caste and Class, Race in Sociology.

Unit - IV

Social -Cultural Processes:

1. Culture
    - 1.1 Meaning
    - 1.2 Characteristics
    - 1.3 Types
    - 1.4 Culture and Civilization
2. Socialization
    - 2.1 Meaning
    - 2.2 Characteristics
    - 2.3 Stages
    - 2.4 Agencies
3. Social Processes
    - 3.1Cooperation
    - 3.2 Accommodation
    - 3.3 Competition
    - 3.4 Conflict

Keywords/Tags: Culture, Social Process, Civilization, Socialization, Cooperation

Unit - V

Social Control and Change:

1. Social Control
    - 1.1 Concept
    - 1.2 Means of Social Control
2. Social Stratification
    - 2.1 Concept
    - 2.2 Bases
3. Social Change

3.1 Meaning

3.2 Characteristics

3.3 Factors of Social Change

3.4 Patterns of Social Change

Keywords/Tags: Social Control, Social Stratification, Social Change, Factors of Social Change, Patterns of Social Change.

Text Books, Reference Books, Other Resources

Suggested Readings:

1. Maclver, Robert, M. and Charles Hunt Page (1949) Society: An Introductory Analysis. New York.

2. Beteille Andre (1965) Caste, Class and Power. California University, Berkcley.

3. Ghurye, G.S. (1961) Caste, Class and occupation, Popular Book Depot, Bombay.

4. Ogburn and Nimkoff (1947) Hand Book of Sociology, K. PAUL, Trench, Prebner and Comp. Ltd. London.

5. Giddens, A. (2006) Sociology (5th ed.). Oxford University Press, London.

6. Horton and Hunt. (1964) Sociology - The Discipline and us Dimensions: New Central Book Agency, Calcutta.

7. Johnson, Harry M, (1988) Sociology - A Systematic Introduction. Allied Publishers Pvt. Ltd, New Delhi.

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Suggestive digital platforms web links

https://nios.ac.in/online-course-material/sr-secondary-courses/Sociology-(331).aspx

Suggested equivalent online courses:

IGNOU and other centrally/state operated Universities/MOOC platforms such as "SWAYAM" in India and Abroad.

Part D- Assessment and Evaluation		
Suggested Continuous Evaluation Methods: Maximum Marks : 100 Continuous Comprehensive Evaluation (CCE): 25 marks University Exam (UE) 75 marks		
Internal Assessment: Continuous Comprehensive	Class Test Assignment/Presentation	15 10

Evaluation (CCE): 25		
External Assessment: University Exam Section: 75 Time: 02:00 Hours	**Section (A) :** Three Very Short Questions (50 Words Each) **Section (B) :** Four Short Questions (200 Words Each) **Section (C):** Two Long Questions (500 Words Each)	03 X 03 = 09 04X09= 36 02X15- 30 Total 75
Any remarks/suggestions:		

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B.S.W. Semester: **I**

Subject: (Paper - IV) Environmental Issues and Disaster Management

Unit - I

Environment and Environmental Issues:

1. Meaning, Concept and Factors of Environment
2. Environment and Resources: Use, Exploitation and Conservation
3. Impact of Human Activities on Environment
4. Major Environment Related Contemporary Issues: Hazards, Global Warming, Environmental Degradation, Deforestation, Pollution and Climate Change.

Unit - II

Hazards and Disasters:

1. Meaning and Concept of Hazards and Disasters
2. Elements/ Aspects of Disaster
3. Disasters: Risk and Vulnerability
4. Classification of Disasters: Natural and Man Made
5. Disasters in India (Natural and Man Made): Causes, Impact, Distribution and Mapping.

Unit - III

Disaster Management - Methods and Approaches:

1. Historical Perspective, Preparedness and Prediction
2. Disaster: Awareness, Mitigation and Prevention
3. Reduction and Management of Disaster
4. Hazards Analysis, Vulnerability Analysis and Hazard Risk Analysis
5. Do's and Don'ts During and Post Disaster

Unit - IV

Disaster Management - Role and Responsibility:

1. International Organizations for Disaster Management

2. National Organizations for Disaster Management

3. Role of ISRO, NIDM, SDAM and Others

4. Indigenous Knowledge and Community based Disaster Management

5. Refugee Operation, Human Settlement and Rehabilitation issues during and after Disasters.

Keywords/Tags: Environment, Human Activities, Global Warming, Climatic change, Vulnerability, Disaster Management, Rehabilitation.

Text Books, Reference Books, Other Resources

Suggested Readings:

1. Goudie Andrew, (1994) The Human Impact on the Natural Environment 9, Blackwell Oxford U.K.

2. Khoshoo, T.N. (1988) Environmental concerns and strategies, Ashish publishing house, New Delhi.

3. Munn, R.E. (1979) Environmental Impact Assessment: Principles and Procedures. John Wiley and Sons, New York.

4. Narain Sunita (2003) The Citizen Fifth Report. Centre for science and Environment, New Delhi.

5. Saxena, H.M. (2000) Environment Management. Rawat Publication, Jaipur.

6. Kapur, A (2010) Vulnerable India.

7. Geographical Study of Disaster, Delhi, India Sage publicactions.

8. Government of India (2011) Disaster Management in India, Delhi, India, Ministry of Home Affairs.

9. Government of India (2008) Vulnerability of India, New Delhi, India.

10- j?kqoa'kh v:.k vkSj pUnzys[kk j?kqoa'kh ¼1989½ i;kZoj.k rFkk iznw"k.k e/;izns'k fgUnh xzUFk vdkneh] Hkksiky-

11- lfoUnz flag] i;kZoj.k Hkwxksy iz;ksx iqLrd lnu bykgkckn-

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13- frokjh] fot; dqekj ¼1998½ & i;kZoj.k ikfjLFkfrdh fgeky; ifCyds'ku] ubZ fnYyh- 14- voLFkh] ,u-,e- vkSj frokjh] vkj-ih- ¼1995½ i;kZoj.k Hkwxksy] e-iz- fgUnh xzUFk vdkneh] Hkksiky-

15- frokjh] vkj-ih- vkSj voLFkh] ,u-,e- ¼2000½ ty lalk/ku ,oa i;kZoj.k izca/ku] ,-ih-,p ifCyf'kax dkiksZjs'ku] U;w fnYyh-

Suggested equivalent online courses:

1. epgp.inflibnet.ac.in

2. Virtual lectures available on YouTube.

Part D- Assessment and Evaluation
Suggested Continuous Evaluation Methods:
Maximum Marks : 100
Continuous Comprehensive Evaluation (CCE): 25
University Exam (UE) 75

Internal Assessment: Continuous Comprehensive Evaluation (CCE): 25	Class Test Assignment/Presentation Total	15 10 25
External Assessment: University Exam Section: 75 Time: 02:00 Hours	**Section (A) :** Three Very Short Questions (50 Words Each) **Section (B) :** Four Short Questions (200 Words Each) **Section (C):** Two Long Questions (500 Words Each)	03 X 03 = 09 04X09= 36 02X15- 30 Total 75
	Total	**75**

Department of Social Work
A.P.S. University, Rewa (M.P.)

B.S.W. Semester: **I**

Subject: (Paper - V) English Language

Unit - I

Reading, Writing and Interpretation Skills:

1. Where The Mind is Without Fear-Rabindranath Tagore **[Key Word: Patriotism]**
2. National Education - M.K. Gandhi **[Key Word: Edification]**
3. The Axe- R.K. Narayan **[Key Word: Environment]**
4. The Wonder That Was India- A.L Basham (an excerpt) **[Key Word: Indianness]**
5. Preface to the Mahabharata C. Rajagopalachari **[Key Word: Indian Mythology]**

Unit - II

Comprehension Skill:

Unseen Passage Followed by Multiple choice questions

Unit - III

Basic Language Skills 1: Vocabulary Building: Suffix, Prefix, Synonyms, Antonyms, Homophones, Homonyms and One-word substitution.

2: Basic Grammar: Noun, Pronoun, Adjective, Verb, Adverb, Prepositions, Articles, Time and Tense

Suggested Readings:

Essential English Grammar - Raymond Murphy, Cambridge University Press.

- Practical English Grammar Exercises 1 - A.J. Thomson and A.V. Martinet, Oxford India.
- Practical English Usage - Michael Swan, Oxford
- English Grammar in Use - Raymond Murphy, Cambridge University Press.

Part D- Assessment and Evaluation

Max Marks: 50	**Min Marks: 17**	**University Exam (UE)**	**Total: 50**
U.E. Time 2 Hours			

	External Assessment (UE)	**Time: 2 Hours**	
	Fifty Multiple Choice/Objective/True-False type questions to be asked. Each question carries one mark		

CENTRE FOR BIOTECHNOLOGY & MICROBIOLOGY STUDIES,

SCHOOL OF ENVIRONMENTAL BIOLOGY,

A.P.S. UNIVERSITY, REWA (M.P.)

BSc. BIOTECHNOLOGY SEM-1				
S.No.	**Paper code**	**PAPER NAME**	**PAPER CATEGORY**	**CREDIT**
1.	C1	Cell Biology	MAJOR	06
2.	C2	Animal Diversity -1	MINOR	06
3.	GEC1	Chemistry -1	GEC	04
4.	AECC1	English	AECC	04
5.				
BSc. BIOTECHNOLOGY SEM-2				
		PAPER NAME	**PAPER CATEGORY**	**CREDIT**
	C3	Genetics & Molecular Biology	MAJOR	06
	C4	Animal Diversity -2	MINOR	06
	GEC2	Chemistry -2	GEC	04
	AECC2	Environmental Studies	AECC	04
BSc. BIOTECHNOLOGY SEM-3				
		PAPER NAME	**PAPER CATEGORY**	**CREDIT**
	C5	Bio-analytical Tools	MAJOR	06
	C6	Plant Biotechnology	MINOR	06
	GEC3	Biochemistry & Metabolism	GEC	04
	SEC1	Industrial Fermentation	SEC	04
BSc. BIOTECHNOLOGY SEM-4				
		PAPER NAME	**PAPER CATEGORY**	**CREDIT**
	C7	Immunology	MAJOR	06
	C8	General Microbiology & Physiology	MINOR	06
	GEC4	Biotechnology & Human Welfare	GEC	04
	SEC2	Molecular Diagnostics	SEC	04
BSc. BIOTECHNOLOGY SEM-5				
		PAPER NAME	**PAPER CATEGORY**	**CREDIT**
	C9	Recombinant DNA Technology	Major	06
	DSE1	Environmental Biotechnology	DSE	04
	SEC3	Animal Biotechnology	SEC	04
		Field Project & Training-1 (Bioprocess Technology)		06
BSc. BIOTECHNOLOGY SEM-6				
		PAPER NAME	**PAPER CATEGORY**	**CREDIT**
	C10	Developmental Biology	Major	06
	DSE2	Forensic Science	DSE	04
	DSE3	Medical Microbiology	DSE	04
		Field Project & Training 2 (Genomics & Proteomics)		06

BSc. BIOTECHNOLOGY SEM-7				
		Paper Name	**PAPER CATEGORY**	**CREDIT**
	C11	Enzymology	MAJOR	06
	DSE4	Bioethics & Bio-safety	DSE	04
	C12	Research Methodology	Minor	04
		Field Project & Training 3 (……)		06
BSc. BIOTECHNOLOGY SEM-8				
		Paper Name	**PAPER CATEGORY**	**CREDIT**
	C13	Medical Biotechnology	MAJOR	06
	C14	Biostatistics & Bioinformatics	MINOR	04
		Research Project (……)		10

ABBREVATION:

CC- CORE COURSE (MAJOR/MINOR)
DSE- DISCIPLINE SPECIFIC ELECTIVE
SEC- SKILL ENHANCMENT COURSE
AECC-ABILITY ENHANCMENT COMPULSORY COURSE
GEC- GENERIC ELECTIVE COURSE

s.no.	Class	Paper	Category	Credit
BT-101	**BSc Biotechnology 1st**	**Cell Biology**	**MAJOR**	**06**

Unit-1

Introduction, Scope and Importance, History of Cytology. Prokaryotic cell, Eukaryotic cell (Plant and Animal Cell). Structure of cell wall.

Plasma membrane: structure and functions (simple diffusion, facilitated diffusion, active transport, endocytosis, pinocytosis, phagocytois, and exocytosis).

Unit-2

Structure and functions of mitochondria, chloroplast, Structure and functions of Endoplasmic reticulum, Endoplasmic reticulum targeting proteins, protein folding and processing in ER, Targeting of lysosomal protein. Structure and function of Golgi complex, Protein Glycosylation within the Golgi. Structure and functions of Ribosome. Lysosome and Inracellular digestion.

Unit-3

The nucleus and nucleolus. structure and classification of Chromosomes. Chromosome structure and its types. Lampbrush and Polytene Chromosomes.**Cellular reproduction:** Cell cycle- mitosis and meiosis.

Unit-4

Cell Motility and Shape I: Structure and function of microfilaments and Intermediate Filaments. Molecular Mechanisms of Cell-Cell Adhesions. Extracellular Matrix of animals, Cell signaling. Introduction and application of stem cells.

Unit-5

General introduction of Cancer, Apoptosis and necrosis.

Techniques in cell biology: chromosomal banding techniques. Principles and applications of light microscope and electron microscope (Scanning and transmission). Karyotyping and Idiogram.

s.no.	Class	Paper	Category	Credit
BT-102	BSc Biotechnology 1st	Animal Diversity -1	Minor	06

Paper-2nd (BT-102)
Animal Diversity -1

Unit-1

Elementary Knowledge of Zoological Nomenclature and International Code. Classification of Lower Invertebrates (According to Parker and Haswell 7th edition)Classification of Higher Invertebrates (According to Parker and Haswell 7th edition) Protozoa- Type, Study of Plasmodium, Protozoa and Diseases.

Unit-2

Porifera- Type study of Sycon.Types of Canal system.

Coelenterata- Type study of ObeliaCorals and Coral Reef formation.

Unit-3

Helminthes- Type study of Liver Fluke.Nematodes and diseases.

Annelida- Type study of earthworm , metamerism.Type Study of Hirudinaria.

Structure and significance of Trochophore larva.

Unit-4

Arthropoda- Type study of Prawn.Types study of Periplanata.

Larval forms of Crustacea.

Insect as Vectors of human diseases.

Unit-5

Mollusca- Type study of Pila

Echinodermata- External features and water vascular system of Star fish.Larval forms of Echinoderms.

Minor Phyla – Ectoprocta & Rotifera.

s.no.	Class	Paper	Category	Credit
BT-103	BSc Biotechnology 1st	Chemistry -1	GEC	04

Paper- 3rd

Chemistry -1

Unit-1

Atomic Structure: Idea of de Broglie matter wave, Heisenberg uncertainty principle, atomic orbital's, Quantum numbers, shapes of s, p, d orbitals, Trends in periodic table and applications in predicting and explaining the physical and chemical behaviors. Atomic radii, ionic radii, ionization energy, electron affinity and electro negativity.

Unit-2

Chemical Bonding: Valence bond theory and its limitations ,directional characteristics of covalent bond, various types of hybridization and shapes of simple inorganic molecules and ions, Valence shell electron pair repulsion (VSEPR) theory, homonuclear and heteronuclear (CO and NO) diatomic molecules, Weak interactions, Hydrogen bonding, van der Waal forces.

Unit-3

s - Block elements: Comparative study, diagonal relationships, salient features of Hydrides, Solvation and complexation tendencies. **p- Block elements:** Comparative study of groups 13–17 elements, compounds like hydrides, oxides, halides of group 13-16, basic properties of halogens, inter halogens and polyhalides. **d- blocks elements**: First transition series -Properties of the elements of the first transition series, stability of their oxidation states, coordination number. Second and Third transition series – General characteristics, comparative treatments with their 3d- analogues in respect of ionic radii, oxidation state and magnetic property.

Unit-4

Thermodynamics- Principles, Kirchhoff's equation, calculation of w, q, ΔU, ΔH, The Hender-Hasselbatch equation, of thermodynamics, Enthalpy, Second law of thermodynamics, Entropy free energy, chemical equilibrium, law of mass sction, Le chatlier's principles.

Different States: Structural differences between - solids, liquids and gases. Intermolecular forces, Definition of space lattice, unit cell. Bragg's equation. crystal structure of NaCl, KCl and CsCl, Ideal and non ideal solutions, methods of expressing concentration of solutions, Acid-Base concept.

Unit-5

Chemical kinetics & its scope, Rate of reaction, factors influencing the rate of reactions, zero order, second order, pseudo order, half life & mean life, various theories of chemical kinetics, Arrhenious equation & catalysis.

Solution, ideal & non ideal solution, Different methods of concentration expression, raoult's law

S.No.	Class	Paper	Category	Credit
BT-104	BSc Biotechnology 1st	English	AECC	04

English Communication

1. Introduction: Theory of Communication, Types and modes of Communication

2. Language of Communication:
Verbal and Non-verbal (Spoken and Written)
Personal, Social and Business Barriers and Strategies
Intra-personal, Inter-personal and Group communication

3. Speaking Skills:
Monologue
Dialogue
Group Discussion
Effective Communication/ Mis- Communication
Interview
Public Speech

4. Reading and Understanding
Close Reading
Comprehension
Summary Paraphrasing
Analysis and Interpretation
Translation(from Indian language to English and vice-versa)
Literary/Knowledge Texts

5. Writing Skills
Documenting
Report Writing
Making notes
Letter writing
Ranjana Kaul,

BSc. BIOTECHNOLOGY SEM-2

S.No.	CLASS	PAPER NAME	PAPER CATEGORY	CREDIT
BT-201	**BSc. BIOTECHNOLOGY SEM-2**	Genetics & Molecular Biology	MAJOR	06

Genetics & Molecular Biology

Unit-1

Importance of Genetics, Gene, allele, genotype and phenotype.
Mendelian laws of inheritance, Monohybrid cross, Law of Dominance and the law ofsegregation, Dihybrid cross and law of independent assortment.
Interactions of genes, complementary genes, reversions , lethal genes, epistasis.Multiple alleles, Blood groups, Rh factor.

Unit-2

Sex linked inheritance**:** X linkage, sex linkage in man, color blindness, Hemophilia (Bleeder's disease) and other genetic diseases.
Characteristics of X linked inheritance.
Y linked inheritance in Man, Inheritance of X-Y linked Genes. Human genetics (pedigree analysis, karyotypes and genetic disorder).

Unit-3

Structure of prokaryotic and eukaryotic genomes. Molecular basis of life.
Nucleic acids as genetic material.Structure of DNA and its alternative forms.
Structure and Types of RNA. DNA replication in prokaryotes (enzymology and process)

Unit-4

Prokaryotic gene expression: Prokaryotic
transcription, Genetic code
Prokaryotic translation. Regulation of gene expression: Operon concept (Lac and Trp operon)

Unit-5

DNA recombination: molecular mechanisms
Mutation (point mutation, frame shift mutation) chromosomal aberration and DNA repair.Oncogenes and Tumor Suppressor Genes: Properties and Significance
Insertion elements and transposons.

S.No.	CLASS	PAPER NAME	PAPER CATEGORY	CREDIT
BT-202	**BSc. BIOTECHNOLOGY SEM-2**	**Animal Diversity -2**	**MINOR**	**06**

Animal Diversity -2

Unit-1

Origin of Chordates Classification of phylum Chordata upto orders according to Parker and Haswell (Latest edition).
Hemichordata – External features and affinities of
Balanoglossus.Urochordata – Type study of Herdmania.
Cephalochordata – Type study of Amphioxus. Affinities of Amphioxus.

Unit-2

Comparative account of limb bones and girdles of vertebrates (Amphibia, Reptiles, Birds andMammals).
Comparative account of digestive system. Comparative account of
respiratory system. Comparative account of aortic arches and
heart.Comparative account of brain
Placentation in mammals.

Unit-3

Origan of life- modern concepts only.Lamarckism, Darwinism.
Modern synthetic theories: Variations, Mutation, Isolation & speciationAdaptation and mimicry Micro, macro evolution and mega evolution.

Unit-4 Aquaculture

Prawn culture: Culture of fresh water prawn, methods of prawn fishing ,preservation and processing ofprawns.
Pearl culture and pear industry. Major carp culture : Management of ponds , preservation and processing of fishes.Maintenance of Aquarium.

Unit-5

Economic Entomology
Sericulture: Species of silkworm, life history of *Bombyx mori*, Sericulture Industry in India. Apiculture – Life cycle of the species methods of bee keeping, products of bees, enemies of bees.Lac culture: Lifecycle, and association with the host plant.
Biological control of insect pests.

S.No.	CLASS	PAPER NAME	PAPER CATEGORY	CREDIT
BT-203	BSc. BIOTECHNOLOGY SEM-2	Chemistry -2	GEC	04

Chemistry -2
(Basics of Organic Chemistry)

Unit-1

Structure of Organic compounds, bond length, bond angle, Hydrogen bond, Resonance, Electronic effects, inductive, Mesomeric, Electromeric & Hyperconjugation. Nucleophiles and Electrophiles, Reaction intermediates Carbonium ions, Carbanions, Free radicals and Carbenes, Homolytic fission and Heterolytic fission.

Unit-2

Introduction, Nomenclature, Isomerism, Preparation and General Properties of Aliphatic hydrocarbons, Alkanes, Alkenes and Alkynes, Cycloalkanes,

Unit-3

Introduction, Nomenclature, Preperation and general properties of Alcohols, Phenols, Aldehydeand Ketones. Aromaticity.

Unit-4

Carbohydrates(monosaccarides, diasaccarides and polysaccharides) : classification and general properties, Glucose and fructose (open chain and cyclic structure), Overview of primary, secondary, tertiary and Quaternary structure of proteins. Introduction, glycerides, synthetic detergents, Introduction, classification of amino acids

Unit-5

Stereochemistry: Simple molecules , Hybridization, conformation & configuration, Geometricalisomerism, optical isomerism, Chirality, Enantiomers and optical activity

S.No.	CLASS	PAPER NAME	PAPER CATEGORY	CREDIT
BT-204	BSc. BIOTECHNOLOGY SEM-2	Environmental Studies	AECC	04

Environmental Studies

Unit 1- The multidisciplinary nature of Environmental Studies, Definitions, scopes & importance, need for public awareness. Natural resources:, renewable & non renewable resources, natural resources & associated problems of forest, water, minerals, food, energy & land resources. Conservation of natural resources, Environmental Ethics:, issues & possible solutions, water conservation, rain water harvesting & watershed management, resettlements & rehabilitation of peoples.

Unit 2- Ecosystems; Concept of an ecosystem, structure & function of an ecosystem, energy flow in the ecosystem, ecological succession, food chain, food webs & ecological pyramids. Types, characteristic features, structure & function of following ecosystem; forest ecosystem, grassland ecosystem, desert ecosystem, aquatic ecosystem (ponds, streams, lakes, rivers, oceans, estuaries etc.)

Unit 3- Concepts of Biodiversity**:** Definition of Genetic species & ecosystem diversity, biogeographical classification of india- value of diversity: consumptive use, productive use, social, ethical, Aesthetic & option values. Biodiversity at global, national & local levels. Hotspotof diversity, threats to biodiversity: habitat loss, poaching of wild life, man wild life conflicts. Endangered & endemic species of india, conservation of biodiversity.

Unit 4- Definition of environmental pollution, causes, effects, & control measures of air, water, soil, marines, thermal & noise pollution. Climate Change: global warming, acid rain, ozone layerdepletion & nuclear accidents. Solid Waste management: causes, effect & control measures of urban & industrial wastes. Role of an individual in prevention of pollution.

Unit 5- Disaster managements: Floods, earthquakes, cyclones, & landslides. Waste lands reclamation, Consumerism & waste product. Population explosion: family welfare programmes, environment & human health, HIV/AIDS: Role of information technology in environmental & human health. Environmental legislation: environment protection act. Air(prevention & control of pollution) Act. Water (prevention & control of pollution) Act. Wild life protection Act. Forest conservation Act.

S.No.	CLASS	PAPER NAME	PAPER CATEGORY	CREDIT
BT- 301	**BSc. BIOTECHNOLOGY SEM-3**	Bio-analytical Tools	MAJOR	06

Bio-analytical Tools

Unit-1

PH Metter, Buffer, Handerson and
Hasselblach equation,Titration of weak acid
and weak bases.
Tracer Technique.

Unit-2

Spectroscopic Technique:Principle and its applications- UV, visible and Fluorescencespectroscopy,X-ray Diffraction, Nuclear Magnetic Resonance (NMR)

Unit-3

Chromatographic Technique: Principle and its Application, Types(Adsorption and Partition Chromatography). Paper, Thin layer, Ion-Exchange, HPLC.

Unit - 4

1Centrifugation Technique,
Electrophoresis of DNA, proteins and
enzymes.Southern, northern and
western blotting

Unit-5

DNA Fingerprinting
(VNTR) PCR and its
different variations.
DNA sequencing

S.No.	CLASS	PAPER NAME	PAPER CATEGORY	CREDIT
BT- 302	**BSc. BIOTECHNOLOGY SEM-3**	**Plant Biotechnology**	**MINOR**	**06**

Plant Biotechnology

UNIT I

Plant Tissue Culture: Basic aspects of plant biotechnology (History, application, scope and importance), laboratory and culture media for plant tissue culture, cell Culture and its applications.

Clonal Propagation and Protoplast Culture: Micro propagation, Somaclonal Variation, Production anduses of Haploids**,** Protoplast isolation, Regeneration of plant, Somatic Hybridization

UNIT II

Gene Transfer in Plants: Vectors of gene transfer (Plasmids, Agrobacterium and Virus vector) Transformation technique (Agrobacterium mediated gene transfer, DNA mediated gene transfer (DMGT) Removal of selected Marker Genes from Transgenic Plants, Regulatory sequences of induced genes.

Transgenic Plant resistance against Stress: Development of herbicide resistant transgenic plant, Development of insect resistant transgenic plant, Transgenic plant resistance against virus, bacterial and fungal pathogens, transgenic plant resistance against abiotic stress.

UNIT III

Genetically Modified Crops and Floricultural Plants: Transgenic plants with improved crop productivity, Transgenic plants with improved nutritional quality, Transgenic plants for Floriculture.

Molecular Farming:

Transgenic Plants for Value Added Specialty Crops, Transgenic Plants for Edible Vaccines, Transgenic Plants for Antibodies and Transgenic Plants for Biopharmaceuticals

UNIT IV

Transgenic Plants for Biosafety: Biosafety regulations of Transgenic Crops, Commercialization of Transgenic plants, quality modifications of plants (Modification of starch quality, modification and futureof oil quality and modification of seed protein quality).

Choloroplast Engineering: plants Engineering of Chloroplast Genome, Transformation of choloroplast genome in higher plants, Transplastomic Plants and its applications (in Tabacco, Patato, Rice, Tomato etc.)

UNIT V

Construction of Molecular Maps: Preparation of Genetic Maps, (cereals, millets, sugarcane, cotton, Soyabean, Pea, Sunflower, etc.), Molecular genetics maps of high density plants, Uses of molecular genetics maps.

Genomics: Microcllinearity in DNA Sequences of Small Genomic Regions, Thale cress genome, Rice (Oryza Sativa).

S.No.	CLASS	**PAPER NAME**	**PAPER CATEGORY**	**CREDIT**
BT- 303	**BSc. BIOTECHNOLOGY SEM-3**	Biochemistry & Metabolism	GEC	04

Biochemistry & Metabolism

Unit-1

The foundation of biochemistry: Biochemical organization of Cell, Intra and inter molecular forces electrostatic interactions and Hydrogen bonding interaction, Vander Waals and Hydrophobic interactions, Disulphide bridges, Role of water and weak interactions, Chemical foundations of Biology- pH, pK, acids, bases, buffers, weak bonds & Covalent bonds.

Unit-2

1. **Carbohydrate:** Classification, Structure & functions.
2. **Lipid:** Classification, nomenclature, structure and properties, Role of lipids in biological system.
3. **Amino Acids:** Classification, structure, properties, Biological important of Amino Acids

Unit-3

1. **Proteins:** Structural organization (Primary, Secondary, Tertiary and Quaternary structure), α helix, β pleated, Biological role of Proteins. Enzyme as a biological catalyst.
2. Structure, function and properties, types of Nucleic Acid (Nucleotide, DNA, RNA), Ribozymes.

Unit-4

1. Basic Concept & Law of thermodynamics. Role of ATP in Metabolism.
2. Metabolism of Glucose- Glycolysis , intermediate Metabolism, Krebs Cycle, Electron Transport chain.
3. Metabolism of lipids

Unit-5

1. Carbohydrate Metabolism in plants.
   C_3. C_4, CAM Cycle, Pentose Phosphate Pathway.
2. Metabolism of Amino Acids.

S.No.	CLASS	PAPER NAME	PAPER CATEGORY	CREDIT
BT- 304	**BSc. BIOTECHNOLOGY SEM-3**	**Industrial Fermentation**	**SEC**	**04**

Industrial Fermentation

UNIT I

Isolation and Culture of microorganisms: History, scope and importance of industrial biotechnology, isolation, screening, culture and preservation of microorganism, strain improvement.

Fermentation Technology: Bioreactor design, and operation types of fermenters, Fermentation media, Batch. Fed batch, continuous culture system, *Insitu* recovery of products.

UNIT II

Alcohol and acid Production: Industrial production of alcoholic beverages vinegar, Ethanol, organic acids, Amino acids and Antibiotics.

Enzyme Production: Properties and types of enzymes, Enzymes production, types and application, immobilization of Enzymes, Enzyme/protein Engineering, industrial processing: (Down stream processing, recovery, extraction and purification of fermentation products).

UNIT III

Dairy Industry: Fermented foods cheese production, use of enzymes in food industry, processing of milkand dairy products (Pasteurized milk, sterilized milk, cream and butter), enzymes in fruit juice and brewing industries (Fruit Juice and Wines, Beer), single cell protein.

Polymer and colloid production: Microbial and algal polysaccharides and polyesters production, (Production of Hydrocolloids and polyhdroxyalkonoides) Mass culture technique for algae, primary and secondary metabolites of microorganism and plants.

UNIT IV

Drug Discovery and Designing: History and molecular aspects of drug discovery, drug discovery in cancer, microbial genomics for new antibiotics, drug designing.

Metabolic engineering: Cloning and expression of heterologous genes, molecular breeding of Bio synthetic pathways, metabolomics and metabolic engineering, limitations in metabolic engineering.

UNIT V

Fuel biotechnology: Concept scope and importance of bio-fuels, bio-ethanol, bio-diesel, bio-hydrogen and biogas. **Bio-pesticides:** Microbial insecticides (Types Production and uses) Bio-pesticides (Types production and uses) principles and objectives of integrated nutrient management, biofertilizer

S.No.	CLASS	PAPER NAME	PAPER CATEGORY	CREDIT
BT- 401	**BSc. BIOTECHNOLOGY SEM-4**	**Immunology**	**Major**	**06**

Immunology

UNIT I

Immunity and Immune response: Innate immune and characteristics of adaptive immune Responses, Hematopoiesis. Anatomical organization of Immune System: Primary Lymphoid Organs, Secondary Lymphoid Organs, Cell of immune system: Mononuclear cells and granulocyte, Antigen presenting cells, lymphocytes and their subsets.

UNIT II

Inflammation: its mediator and the process, cell-adhesion molecules and their role inInflammation,

role of anaphylatoxins, granulocyte in inflammatory process.

Major histocompatibility systems:

UNIT III

Antigen: Properties, types and determinants of antigenicity, Heptanes: Factor affecting immunogenicity, Super antigen.
Antibody: Nature, Types and Structure of Immunoglobulin and Their Functions. Antigen-Antibody interaction avidity and affinity.

UNIT IV

Monoclonal antibodies: production, characterization and application .Compliment System,

components, Activation pathway and regulation.Hypersensitivity and its types.

UNIT V

Autoimmunity and Immunodeficiency SyndromeVaccines: Active and passive immunization.

Immunotechniques: Immunodifusion, Immunoprecipitation, ELISA, RIA.

S.No.	CLASS	PAPER NAME	PAPER CATEGORY	CREDIT
BT- 402	**BSc. BIOTECHNOLOGY SEM-4**	**General Microbiology & Physiology**	**Minor**	**06**

General Microbiology & Physiology

UNIT I

Fundamentals, History and Evolution of Microbiology.
Classification of microorganisms: Microbial taxonomy, criteria used including molecular approaches, Microbial phylogeny and current classification of bacteria.
Microbial Diversity: Distribution and characterization Prokaryotic and Eukaryotic cells, Morphology and cell structure of major groups of microorganisms eg. Bacteria, Algae, Fungi, Protozoa and Unique features of viruses.

UNIT II

Cultivation and Maintenance of microorganisms: Nutritional categories of micro-organisms (autotrophs, hetrotrophs, chemotrophs),methods of isolation, Purification and preservation.

UNIT III

Microbial growth: Growth curve, Generation time, synchronous batch and continuous culture,measurement of growth and factors affecting growth of bacteria.
Microbial Metabolism: Metabolic pathways, amphi-catabolic and biosynthetic pathways
Bacterial Reproduction: Transformation, Transduction and Conjugation. Endospores andsporulation in bacteria.

UNIT IV

Control of Microorganisms: By physical, chemical and chemotherapeutic Agents
Water Microbiology: Bacterial pollutants of water, coliforms and non coliforms. Sewage composition and its disposal.
Food Microbiology: Important microorganism in food Microbiology: Moulds, Yeasts, bacteria. Major food born infections and intoxications, Preservation of various types of foods. Fermented Foods.

Unit V

Phototrophic metabolism: anoxygenic & oxygenic photosynthesis, Photosynthetic pigments physiology of bacterial photosynthesis cyclic & non cyclic phosphorylation carbon dioxide fixation, calvin cycle. Methanogens.

S.No.	CLASS	**PAPER NAME**	**PAPER CATEGORY**	**CREDIT**
BT- 403	**BSc. BIOTECHNOLOGY SEM-4**	Biotechnology & Human Welfare	GEC	04

Biotechnology & Human Welfare

UNIT I

Industry: protein engineering; enzyme and polysaccharide synthesis, activity and secretion, alcohol and antibiotic formation.

UNIT II

Agriculture: N2 fixation: transfer of pest resistance genes to plants; interaction between plants and microbes; qualitative improvement of livestock.

UNIT III

Environments: e.g. chlorinated and non-chlorinated organ pollutant degradation; degradation of hydrocarbons and agricultural wastes, stress management, development of biodegradable polymers such as PHB.

UNIT IV

Forensic science: e.g. solving violent crimes such as murder and rape; solving claims of paternityand theft etc. using various methods of DNA finger printing.

UNIT V

Health: e.g. development of non-toxic therapeutic agents, recombinant live vaccines, gene therapy, diagnostics, monoclonal in *E.coli*, human genome project.

S.No.	CLASS	PAPER NAME	PAPER CATEGORY	CREDIT
BT- 404	**BSc. BIOTECHNOLOGY SEM-4**	Molecular Diagnostics	GEC	04

MOLECULAR DIAGNOSTICS

UNIT I

Enzyme Immunoassays:

Comparison of enzymes available for enzyme immunoassays, conjugation of enzymes. Solid phases used in enzyme immunoassays. Homogeneous and heterogeneous enzyme immunoassays. Enzyme immunoassays after immuno blotting. Enzyme immuno histochemical techniques. Use of polyclonal or monoclonal antibodies in enzymes immuno assays.

Applications of enzyme immunoassays in diagnostic microbiology

UNIT II

Molecular methods in clinical microbiology:

Applications of PCR, RFLP, Nuclear hybridization methods, Single nucleotide polymorphism and plasmid finger printing in clinical microbiology

Laboratory tests in chemotherapy:

Susceptibility tests: Micro-dilution and macro-dilution broth procedures. Susceptibility tests:Diffusion test procedures. Susceptibility tests: Tests for bactericidal activity. Automated procedures for antimicrobial susceptibility tests.

UNIT III

Automation in microbial diagnosis, rapid diagnostic approach including technical purificationand standardization of antigen and specific antibodies. Concepts and methods in idiotypes. Antiidiotypes and molecular mimicry and receptors. Epitope design and applications. Immunodiagnostic tests. Immuno florescence. Radioimmunoassay.

UNIT IV

GLC, HPLC, Electron microscopy, flowcytometry and cell sorting.Transgenic animals.

Unit V:

S.No.	CLASS	**PAPER NAME**	**PAPER CATEGORY**	**CREDIT**
BT- 501	**BSc. BIOTECHNOLOGY SEM-5**	Recombinant DNA Technology	Major	06

RECOMBINANT DNA TECHNOLOGY

UNIT I

Molecular tools and applications- restriction enzymes, ligases, polymerases, alkaline phosphatase. Gene Recombination and Gene transfer: Transformation, Episomes, Plasmids and other cloning vectors (Bacteriophage-derived vectors, artificial chromosomes), Microinjection, Electroporation, Ultrasonication, Principle and applications of Polymerase chain reaction (PCR), primer-design, and RT- (Reverse transcription) PCR.

UNIT II

Restriction and modification system, restriction mapping. Southern and Northern hybridization. Preparation and comparison of Genomic and cDNA library, screening of recombinants, reverse transcription,. Genome mapping, DNA fingerprinting, Applications of Genetic Engineering Genetic engineering in animals: Production and applications of transgenic mice, role of ES cells in gene targeting in mice, Therapeutic products produced by genetic engineering-blood proteins, human hormones, immune modulators and vaccines (one example each).

UNIT III

Random and site-directed mutagenesis: Primer extension and PCR based methods of site directed mutagenesis, Random mutagenesis, Gene shuffling, production of chimeric proteins, Protein engineering concepts and examples (any two).

UNIT IV

Genetic engineering in plants: Use of *Agrobacterium tumefaciens* and A. rhizogenes, Ti plasmids, Strategies for gene transfer to plant cells, Direct DNA transfer to plants, Gene targeting in plants, Use of plant viruses as episomal expression vectors.

UNIT V

S.No.	CLASS	**PAPER NAME**	**PAPER CATEGORY**	**CREDIT**
BT- 502	**BSc. BIOTECHNOLOGY SEM-5**	Environmental Biotechnology	DSE	04

Environmental Biotechnology

UNIT I

Basic concepts of Environment: Basic concept of Environment & its component (Origin of earth, atmosphere, life & ecosystem), Scope & importance of environmental biotechnology.
Global Environmental Problems: Ozone depletion, UV- B, Green House Effect, Acid Rain, Climate change

UNIT II

Environmental Monitoring: Methods for sampling & measurement of air pollution, methods for sampling & measurement of water pollution, methods for sampling & measurement of soil pollution, permissible limits & indices for pollution.
Environmental Pollution & Control: sources, effects & control of air pollution, noise pollution, thermal pollution, water pollution, soil & solid waste pollution.

UNIT III

Bioremediation: Bio-remediation of inorganic & organic pollutants, bioremediation of xenobiotics, phytoremediation.
Solid & liquid waste Treatment: Microbial treatment of solid waste, liquid waste (Example sewage) waste water treatment, biotechnology for enhanced oil recovery.

UNIT IV

Clean Technology: Integrated pest management, biopolymer production & bioplastic technology, biotechnology for energy (production of biofule, biogas, microbial hydrogen).
Bio-fertilizers: vermin compost, green manure, use of microbes for improving soil fertility.

UNIT V

Restoration Technology: Reforestation through micro-propagation, Soil restoration, Lake Restoration, Biodiversity conservation.
Biosensor and Bio-reporter Technology: Principle types and application of biosensor, bio- reporter (Reporter Gene System).

S.No.	CLASS	**PAPER NAME**	**PAPER CATEGORY**	**CREDIT**
BT- 503	**BSc. BIOTECHNOLOGY SEM-5**	Animal Biotechnology	SEC	04

Animal Biotechnology

UNIT I

Animal cell and tissue culture: History and scope of animal biotechnology and genomics, advantage and Laboratory Facilities for Cell and Tissue Culture, Substrate, Culture Media and Procedures for Cell and Tissue Culture, Primary cell Culture and Cell Lines,

Stem Cells: Introduction, Origin, Types and functions of Stem Cells, Therapeutics, cloning for embryonic stem cells, Stem Cell Therapy.

UNIT II

Organ/Embryo Culture: Primary Tissue Explanation Techniques, Organ Culture, Embryo Culture.

Cell and Tissue engineering: Approaches and Bio-Materials for tissue engineering, Tissue engineering of skin (Skin Graft), Engineering of Bone Crafts and Artificial Nerve Crafts, Future Limitations and Possibilities of Tissue Engineering.

UNIT III

In Vitro Fertilization and Embryo Transfer: In Vitro Fertilization in Human, Embryo Transfer (ET) in Humans, Super Ovulation and Embryo Transfer in Farm Animals (e.g. Cow).

Cloning of Animals: Method, Types and utility of cloning animals, Cloning for Production of Transgenic Animals, Human Cloning and Ethical issues and Risk.

UNIT IV

Transgenic Animals: Gene Transfer or Transfection (Transfection of embryo, unfertilized eggs, culture of mammalian cells), Transgenic Animals, Cryopreservation.

UNIT V

Molecular Maps: Genetic Maps Using Molecular Markers, Cytogenetic Maps Using Molecular Markers, Physical Maps Using Molecular Markers.

Genomics and Proteomics: Human Genome project, Progressing Genomic Research (*Drosophila*, Mouse, Rat, Chimpanzee), Integrated Genomic Maps and Linkage Disequilibrium, Maps of the Future, Introduction types and application of proteomics.

S.No.	CLASS	**PAPER NAME**	**PAPER CATEGORY**	**CREDIT**
BT- 601	**BSc. BIOTECHNOLOGY SEM-6**	Developmental Biology	Major	06

DEVELOPMENTAL BIOLOGY

UNIT I: Gametogenesis and Fertilization

Definition, scope & historical perspective of development Biology, Gametogenesis – Spermatogenesis, Oogenesis Fertilization - Definition, mechanism, types of fertilization. Different types of eggs on the basis of yolk.

UNIT II: Early embryonic development

Cleavage: Definition, types, patterns & mechanism Blastulation: Process, types & mechanism Gastrulation: Morphogenetic movements– epiboly, emboly, extension, invagination, convergence, de-lamination. Formation & differentiation of primary germ layers, Fate Maps inearly embryos.

UNIT III: Embryonic Differentiation

Differentiation: Cell commitment and determination- the epigenetic landscape: a model of determination and differentiation, control of differentiation at the level of genome, transcription and post-translation level Concept of embryonic induction: Primary, secondary & tertiaryembryonic induction, Neural induction and induction of vertebrate lens.

UNIT IV: Organogenesis

Neurulation, notogenesis, development of vertebrate eye. Fate of different primary germlayers Development of behaviour: constancy & plasticity, Extra embryonic membranes, placenta in Mammals**.**

S.No.	CLASS	**PAPER NAME**	**PAPER CATEGORY**	**CREDIT**
BT- 602	**BSc. BIOTECHNOLOGY SEM-6**	Forensic Science	DSE	04

FORENSIC SCIENCE

Unit I

Introduction and principles of forensic science, forensic science laboratory and its organization and service, tools and techniques in forensic science, branches of forensic science, causes of crime, role of modus operandi in criminal investigation. Classification of injuries and their medico-legal aspects, method of assessing various types of deaths.

Unit II

Classification of fire arms and explosives, introduction to internal, external and terminal ballistics. Chemical evidence for explosives. General and individual characteristics of handwriting, examination and comparison of handwritings and analysis of ink various samples.

Unit III

Role of the toxicologist, significance of toxicological findings, Fundamental principles of fingerprinting, classification of fingerprints, development of finger print as science for personal identification,

Unit IV

Principle of DNA fingerprinting, application of DNA profiling in forensic medicine, Investigation Tools, eDiscovery, Evidence Preservation, Search and Seizure of Computers, Introduction to Cyber security.

S.No.	CLASS	**PAPER NAME**	**PAPER CATEGORY**	**CREDIT**
BT- 603	**BSc. BIOTECHNOLOGY SEM-6**	Medical Microbiology	DSE	04

MEDICAL MICROBIOLOGY

UNIT I

Introduction: Normal microflora of human body, nosocomial infections, carriers, septic shock, septicemia, pathogenicity, virulence factors, toxins, biosafety levels.

Morphology, pathogenesis, symptoms, laboratory diagnosis, preventive measures and chemotherapy of gram positive bacteria: *S.aureus, S.pyogenes, B.anthracis, C.perferinges, C.tetani, C.botulinum, C.diphtheriae M.tuberculosis, M. leprae.*

UNIT II

Morphology, pathogeneis, symptoms, laboratory diagnosis, preventive measures and chemotherapy caused by gram negative bacteria: *E.coli, N. gonorrhoea, N. meningitidis, P. aeruginosa, S. typhi, S. dysenteriae, Y. pestis, B. abortus, H. influenzae, V. cholerae, M. pneumoniae, T. pallidum M. pneumoniae, Rickettsiaceae, Chlamydiae.*

UNIT III

Diseases caused by viruses- Picornavirus, Orthomyxoviruses, Paramyxoviruses, Rhabdoviruses, Reoviruses, Pox virus, Herpes virus, Papova virus, Retro viruses (including HIV/AIDS) and Hepatitis viruses.

UNIT IV

Fungal and Protozoan infections. Dermatophytoses (*Trichophyton, Microsporun and Epidermophyton*) Subcutaneous infection (*Sporothrix, Cryptococcus*), systemic infection (*Histoplasma, Coccidoides)* and opportunistic fungal infections (*Candidiasis, Aspergillosis*), Gastrointestinal infections (Amoebiasis, Giardiasis), Blood-borne infections (Leishmaniasis, Malaria)

S.No.	CLASS	PAPER NAME	PAPER CATEGORY	CREDIT
BT-701	**BSc. BIOTECHNOLOGY SEM-7**	Enzymology	MAJOR	06

ENZYMOLOGY

UNIT - I

Isolation, crystallization and purification of enzymes, test of homogeneity of enzyme preparation, methods of enzyme analysis.
Enzyme classification (rationale, overview and specific examples) Zymogens and their activation (Proteases and Prothrombin).
Enzyme substrate complex: concept of E-S complex, binding sites, active site, specificity, Kinetics of enzyme activity, Michaelis-Menten equation and its derivation,
Different plots for the determination of Km and Vmax and their physiological significance, factors affecting initial rate, E, S, temp. & pH. Collision and transition state theories, Significance of activation energy and free energy.

UNIT – II

Two substrate reactions (Random, ordered and ping-pong mechanism) Enzyme inhibition types of inhibition, determination of Ki, suicide inhibitor.
Mechanism of enzyme action: General mechanistic principle, factors associated with catalytic efficiency: proximity, orientation, distortion of strain, acid-base, nucleophilic and covalent catalysis. Techniques for studying mechanisms of action, chemical modification of active site groups, specific examples-: chymotrypsin, Iysozyme, GPDH, aldolase, RNase, Carboxypeptidase and alcohol dehydrogenase.
Enzyme regulation: Product inhibition, feed backcontrol, covalent modification.

UNIT – III

Allosteric enzymes with special reference to aspartate transcarbomylase and phosphofructokinase. Qualitative description of concerted and sequential models. Negative co- operativity and half site reactivity. Enzyme - Enzyme interaction, Protein ligand binding,measurements analysis of binding isotherm, cooperativity, Hill and scatchard plots, kinetics of allosteric enzymes. Isoenzymes– multiple forms of enzymes with special reference to lactate dehydrogenase. Multienzyme complexes. Ribozymes. Multifunctional enzyme-eg Fatty Acid synthase.

UNIT – IV

Enzyme Technology: Methods for large scale production of enzymes.
Immobilized enzyme and their comparison with soluble enzymes, Methods for immobilization of enzymes. Immobilized enzyme reactors. Application of Immobilized and soluble enzyme in health and industry. Application to fundamental studies of biochemistry. Enzyme electrodes.
Thermal stability and catalytic efficiency of enzyme, site directed mutagenesis and enzyme engineering– selected examples, Delivery system for protein pharmaceuticals, structure function relationship in enzymes, structural motifs and enzyme evolution.
Methods for protein sequencing. Methods for analysis of secondary and tertiary structures of enzymes. Protein folding *invitro* & i*nvivo*.

S.No.	CLASS	PAPER NAME	PAPER CATEGORY	CREDIT
BT-702	**BSc. BIOTECHNOLOGY SEM-7**	**Bioethics & Bio-safety**	**DSE**	**04**

Bioethics & Bio-safety

UNIT-I

Introduction to Indian Patent Law. World Trade Organization and its related intellectual property provisions. Intellectual/Industrial property and its legal protection in research, design and development. Patenting in Biotechnology, economic, ethical and depository considerations.

UNIT II

Entrepreneurship: Selection of a product, line, design and development processes, economics on material and energy requirement, stock the product and release the same for making etc. The basic regulations of excise: Demand for a given product, feasibility of its production under given constraints of raw material, energy input, financial situations export potential etc.

UNIT III

Bioethics – Necessity of Bioethics, different paradigms of Bioethics – National & International. Ethical issues against the molecular technologies.

UNIT IV

Biosafety– Introduction to biosafety and health hazards concerning biotechnology. Introduction to the concept of containment level and Good Laboratory Practices (GLP) and Good Manufacturing Practices (GMP).

S.No.	CLASS	PAPER NAME	PAPER CATEGORY	CREDIT
BT-703	BSc. BIOTECHNOLOGY SEM-7	Research Methodology	Minor	04

Research Methodology

Unit 1.

Identification and defining of the Research Problem:

Familiarization of research areas; Review of literature using appropriate resources – reviews, research papers, books and patents; Use of tools for searching literature through electronic databases; Defining a research problem.

Unit 2.

Experimental Approaches and Methodology

Experimental designs to address the research problem; different experimental strategies; Finalization of experimental design; Tools and techniques to execute experiments; Means to validate and analyze data;

Unit 3.

Ethics in Biological Research

Guidelines for Biosafety and Bioethics; Institutional Biosafety Committee – Handling of Genetically modified organisms, Institutional Human and Animal Ethics Committee - compliance, concerns and approval

Unit 4.

Presentation, Publication and Protection of Research Data.

Skills for scientific writing and research presentation – Term paper, Research project, Research report, Thesis, Research article and Review; Organization of the research document in to different sections (Introduction, Methodology, Results, Discussion, and Summary and Conclusions, Bibliography); Use of electronic tools for bibliographic formatting and checking Plagiarism; Oral presentation skills; Patents and Intellectual property rights

Unit 5.

Statistical analysis and Biosafety in research

Safety practices and disposal of Bio-waste in the laboratory; Radioactivity and safety precautions; Handling and disposal of flammable and hazardous chemicals.

Use of statistical tools for analyzing the significance and interpretation of the data; Methods of recording observations and documentation

S.No.	CLASS	PAPER NAME	PAPER CATEGORY	CREDIT
BT-801	BSc. BIOTECHNOLOGY SEM-8	Medical Biotechnology	MAJOR	06

Medical Biotechnology

UNIT I

Biotechnology in medicine: History, scope & importance of Biotechnology in medicine Disease Diagnosis (DNA, RNA probes, Monoclonal Antibodies auto Antibodies), Detection and Treatment of genetic Diseases.

Genetic Counseling and Forensic Medicine: Fertility control, Genetic counseling, (Chance of having child with congenital defects, choice of Baby sex), DNA Fingerprinting in Forensic Medicines.

UNIT 1I

Gene therapy: Definition and types of Gene therapy, Initial success and future of Gene therapy, Vectors and other delivery system of gene therapy, Target tissue for gene therapy system, Gene therapy of genetic diseases(Neurological Disorders, Cystic Fibrosis),Gene therapy of Acquire diseases(Infectious Diseases, Cardiovascular diseases, cancer), Nanobiotechnology for drug targeting and gene therapy.

UNIT III

Pharmaceutical Biotechnology: Drug development, drug manufacturing processes, manufacturing processes of antiviral drugs, drug designing, Novel drug delivery systems, Antimicrobial drugs.

Pharmacogenetics: Pharmacogenetics and personalized medicine, genetics and genomics in medical practice, use of SNPs in pharmocogenomics.

UNIT IV

Genetic Engineering: Genetic and recombinant vaccines; Edible vaccines production of therapeutic proteins; Genetic engineering for production of Factor VIII, tissue plasminogen activator, Interferon.

Tissue Engineering: Tissue engineering of skin and cartilage and their applications, properties and types of stem cells, culture and applications of stem cells, Transplant rejection, Intellectual property issues in using human embryonic stem cells.

UNIT V

Biological Database : Introduction, History and applications of Bio-Informatics, Sequences and Nomenclature (DNA sequences, Amino acid sequences of proteins, Types of sequences in nucleotide sequence database), Database and search tool (FASTA, BLASTA Nucleotide sequence database, protein database), GCG: The Wisconsin pacakage of sequence analysis programe, Detection of genes, Protein structure prediction, Large scale Bio-informatics genome projects.

S.No.	CLASS	PAPER NAME	PAPER CATEGORY	CREDIT
BT-802	BSc. BIOTECHNOLOGY SEM-8	Biostatistics & Bioinformatics	MINOR	04

Biostatistics & Bioinformatics

UNIT I

Types of Data, Collection of data; Primary & Secondary data, Classification and Graphical representation of Statistical data. Measures of central tendency and Dispersion. Measures of Skewness and Kurtosis.

UNIT II

Probability classical & axiomatic definition of probability, Theorems on total and compound probability), Elementary ideas of Binomial, Poisson and Normal distributions.

UNIT III

Methods of sampling, confidence level, critical region, testing of hypothesis and standard error, large sample test and small sample test. Problems on test of significance, t-test, chi-square testfor goodness of fit and analysis of variance (ANOVA)

UNIT IV

Correlation and Regression. Emphasis on examples from Biological Sciences.

UNIT V

Sequence and Phylogeny analysis, Detecting Open Reading Frames, Outline of sequence Assembly, Mutation/Substitution Matrices, Pairwise Alignments, Introduction to BLAST, usingit on the web, Interpreting results, Multiple Sequence Alignment, Phylogenetic Analysis, Sequence Similarity Searches-BLAST,FASTA, Data Submission.