DEPARTMENT OF MATHEMATICS

Programme Outcomes :

Knowledge Outcomes: After completing MSc (Mathematics) program students will:

- Get advanced knowledge of principles, methods and clear perception of innumerous power of mathematical ideas and tools.
- Be able to apply their skills and knowledge, that is translate information presented verbally into Mathematical form select and use appropriate mathematical formulae or techniques in order to process the information and draw relevant conclusion
- Be able to find out or analyze scientific reasoning for various things.
- Get knowledge about both pure as well as applied mathematics branches.

Skill Outcomes: After completing BSc (Mathematics) program students will:

- Get adequate exposure to global and local concerns that explore them many aspects of Mathematical sciences
- Get a relational understanding of mathematical concepts and concerned structures
- Communicate scientific information in a clear and concise manner both orally and in writing or through audio video presentations

Generic Outcomes: Students will:

- Develop a positive attitude towards mathematics as an interesting and valuable subject of study
- Develop capacity of critical reasoning, theoretical applied and communication skills.
- Develop abilities for logical thinking and problem solving.

BSc First Year (Foundation Cousre)

Outcomes of (FC) Digital Awareness - Cyber Security

Class :- BA/BSc./BCom/BBA/BCA III Year

After completing the course, student will be able to :

- Make optimum use of web browsers, search engines and Chatbots
- Creating e-mail account, sending, receiving and managing emails.
- Describe reporting procedure of phishing emails.
- Identify email phishing attack and preventive measures.
- Configure security settings in Mobile Wallets and UPIs.
- Practice safe, legal and ethical means of using Information Technology.

- Practice and use the various online financial and government services of day-to-day use.
- Understand the basic concepts related to E-Commerce and digital payments.
- Discuss cyber security aspects, RBI guidelines and preventive measures against digital payment frauds.
- Explore and learn the online available courses of his/her interest.
- Use the Digilocker and Academic Bank of Credit.
- Describe the concept of Cyber security and issues and challenges associated with it.
- Explain the process of reporting cyber crime at Cyber crime Police Station/ at online platform.
- Appreciate various privacy and security concerns on online Social media.
- Guide through the reporting procedure of inappropriate content.
- Perform privacy and security settings for popular Social media platforms

BSc (Mathematics)

Program Outcomes

- Enabling students to develop a positive attitude towards mathematics as an interesting and valuable subject of study.
- A student should get a relational understanding of mathematical concepts and concerned structures, and should be able to follow the patterns involved, mathematical reasoning.
- Ability to analyze a problem, identify and define the computing requirements, which may be appropriate to its solution.
- Introduction to various courses like group theory, ring theory, field theory, metric spaces, number theory.
- Enhancing students' overall development and to equip them with mathematical modelling abilities, problem solving skills, creative talent and power of communication necessary for various kinds of employment.
- Ability to pursue advanced studies and research in pure and applied mathematical science.

Programme Specific Outcomes of BSc Mathematics

- Think in a critical manner.
- Know when there is a need for information, to be able to identify, locate, evaluate, and effectively use that information for the issue or problem at hand.
- Formulate and develop mathematical arguments in a logical manner.
- Acquire good knowledge and understanding in advanced areas of mathematics and statistics, chosen by the student from the given courses.
- Understand, formulate and use quantitative models arising in social science, business and other contexts

BSc First Year (Mathematics)

Course Outcomes

- This course aim satac quainting students with learn various concept sand basic technique sessential for conduct of practical in computers.
- Basic understanding about Computer.
- Understanding the basic concept associated with C- Language and program designing Students will develop different programs, Run and Retrieve results.
- Intellectual(Cognitive/Analytical)skills:
- Design program in C-language on the basis of given query. Use of data structures in C
- Use of standard input (scanf) and standard output (printf) functions
- Use of variables, key words, arithmetic operators, relational operators, logical operators, unary operators, assignment operator, arithmetic assignment operators and conditional operator.
- Use of library functions and user defined functions.
- Use of Looping Statement (like while, do-while, for loops) and branching statements (like if, if-then, if-then-else).
- Create functions and to show different calls: Call by reference, Call by value.

In future student may be able to develop a big program(s) (Software) which may simulate the behavior of the chemical reaction/processes/events

Course Title: (Paper-I) Algebra and Trigonometry {open elective}

Course Outcomes: After the completion of the course, students will be able to:

- Understand the transformation of matrix which is useful to find rank of matrix. Learn to find the determinant of a product of square matrices, of the transpose of a square matrix, and of the inverse of an invertible matrix. Learn to find the characteristic equation, Eigen values and corresponding eigenvectors of a given matrix.
- Learn to solve the matrix equation Ax = b using row operations and matrix operations. Learn to find the determinant of a product of square matrices, of the transpose of a square matrix, and of the inverse of an invertible matrix. Learn to find the characteristic equation, Eigen values and corresponding eigenvectors of a given matrix. Learn to solve system of linear equation.
- Learn to find roots of polynomial, relation between the roots and coefficients of polynomials. Learn to transformation of equations, reciprocal equations and Descartes rule of signs.
- Learn to evaluate trigonometric and inverse trigonometric functions. Learn to solve trigonometric equations and applications. Learn to apply and prove trigonometric identities.
- Learn to use truth tables and laws of identity, distributive, commutative, and domination. Learn to simplify and prove Boolean expressions. Learn to compute sum of products and product of sum expansions. Learn to convert Boolean expressions to logic gates and vice-versa.

Course Title: (Paper-II) Calculus and Differential equations {Minor}

Course Outcomes: Students would have:

- Knowledge of successive differentiation, Maclaurins, and Taylors Theorem.
- edge of curvature, concavity and convexity, point of inflexion, multiple points, curve tracing.
- Knowledge of integration of transcendental function, reduction formula.
- Knowledge offers order differential equations utilizing the standard techniques for separable, exact, linear, homogeneous, or Bernoulli cases. Knowledge of Linear differential equation, Claimants equation and singular solution. Solve second order and higher order linear differential equations.
- Knowledge of the complete solution of a no homogeneous differential equation as a linear combination of the complementary function and a particular solution. Knowledge to solve linear differential equation of second order, method of variation of parameter

Course Title: (Paper-III) Vector Analysis and Geometry {Major}

Course Outcomes: After the completion of the course, students will be able to:

- Get knowledge of scalar and vector product of three and four vectors.
- Understand gradient, divergence, curl and vector identities.
- Understand General Equation of second degree, tracing of conics.
- Find equation of cone with given base, equation of cylinder and its properties.
- Get an idea of central conicoid, parabola, and plane section of conicoid.

BSc Second Year (Mathematics)

Course Title :(Paper-I) -Major: AbstractAlgebraandLinearAlgebra

Course Code:S2-MATH2T

Course Outcomes: Thecoursewillenablethestudentsto:

- Recognize the algebraicstructuresasa group, and classify themas abelian, cyclican dpermutation groups, etc.
- Link the fundamental concepts of groups and symmetrical figures.
- Analyze the sub groups of cyclic groups.
- Explain the significance of the notion of cosets, normal sub groups, and quotient groups.
- The fundamental concept of rings, fields, sub rings, integral domainsand the correspondin gmorphisms.
- Analyze whether a finite set of vectors in a vector space is linearly independent. Explain the concepts of basis and dimension of avectorspace.
- Understand the linear transformations, rank and nullity, matrix of alinear

transformation, algebra of transformations and change of basis.

- Compute the characteristic polynomial, eigenvalues, eigenvectors, and eigenspaces, as well as the geometric andthe algebraic multiplicities of an eigenvalue and apply the basic diagonalization result.

Course Title :(Paper-II)-MajorII/Minor: Advanced Calculus and Partial Differential Equations

Course Code: S2-MATH2T

Course Outcomes:

Students would be able to:

CO1- The course will enable the students to:

CO2- I. Understand many properties of the real line Rand sequences.

CO3- Calculate the limit superior, the limit inferior, and the limit of a bounded sequence.

CO4- Apply the mean value theorems and Taylor's theorem.

CO5- Apply the various tests to determine convergence and absolute convergence of an infinite series of real numbers.

CO6- Formulate, classify and transform partial differential equations into canonical form.Use the knowledge of double and triple integrals for finding area and volume

Course Title: Generic Elective**:** Trigonometry, Calculus and Differential Equations

Course Code-S2-MATH1G

Course Outcomes: The course will enable the students to:

- Understand the trigono metrically functions.
- Find out Maxima and minimaof various functions.
- Solve simple problems related to real-life situations.
- Useof differential equations approach indifferent areas of business and science.
- Formulate the differential equations of first order and first degree for various mathematical problems.

BSc III Year (Mathematics)

Course Title: (Paper-I) Linear Algebra and Numerical Analysis

Course Outcomes: After the completion of the course, students will be able to

- Familiar with vector space, basis and dimension of vector space. Recognize the concepts of the terms span, linear independence, basis, dimension, and apply these concepts to various vector spaces and subspaces.
- Understand the concept of linear transformations, their properties, and their representation as matrices.
- Understand the concept of inner product spaces and determine orthogonality in inner product spaces.
- Understand approximations, solution of equations and Interpolation.
- Solve Linear equations and Numerical Differentiation.

- Get an idea of solve ordinary differential equation, numerical integration with their derivation. Using appropriate numerical methods determine approximate solution of ODE and system of linear equation.

Course Title: (Paper-II) Real and Complex Analysis

Course Outcomes: After the completion of the course, students will be able to:

- Understand the concept of Riemann integral. Learn some of the properties of Riemann integrable functions, and the applications of the fundamental theorems of integration.
- Study different tests for solving improper integrals of first and second kind.
- Understand the concept of metric space, open & close sets, closure, interior, Boundary points, continuity, connectedness, compactness, Cauchy's sequence, dense subset, separable, first and second countable space, contraction principle, uniform continuity.
- Determine whether the given complex function is continuous/ differentiable / analytic, and find the derivative of a function. Use Cauchy's integral theorem and formula to compute line integrals.
- Find the Taylor's series and Laurent's series of a function and determine its circle or annulus of convergence. Classify singularities, examine the theory, compute the residue of a function and able to apply the concepts of the calculus of residues in the evaluation of integrals.

Course Title: (Paper-III) Discrete Mathematics

Course Outcomes: After the completion of the course, students would be able to:

- Get knowledge of Boolean algebra and Boolean functions- DNF & CNF.
- Describe the concepts of partially ordered sets, lattices and their types, Hassle diagram.
- Understand how graph theory has been. To understand the concept of vertex connectivity and edge connectivity in graphs. Assimilate various graph theoretic concepts and familiarize with their applications. To understand the concept of Euler digraphs and Hamiltonian digraphs.
- Understand the concept of matrices in graphs like Incidence matrix, Adjacency matrix and cutest and its properties, planner graphs etc.
- Understand the idea of trees and its properties, types of trees. Knowledge of Kruskal's Algorithm and Prim's Algorithm.

MSc (Mathematics)

Programme Outcomes

- Inculcate critical thinking to carry out scientific investigation objectively without being biased with preconceived notions.

- Equip the student with skills to analyze problems, formulate a hypothesis, evaluate and validate results, and draw reasonable conclusions there of.
- Prepare students for pursuing research or careers in industry in mathematical sciences and allied fields
- Imbibe effective scientific and/or technical communication in both oral and writing.
- Continue to acquire relevant knowledge and skills appropriate to professional activities and demonstrate highest standards of ethical issues in mathematical sciences.
- Create awareness to become an enlightened citizen with commitment to deliver one's responsibilities within the scope of bestowed rights and privileges.

Programme Specific Outcomes

- Understanding of the fundamental axioms in mathematics and capability of developing ideas based on them.
- Inculcate mathematical reasoning.
- Prepare and motivate students for research studies in mathematics and related fields.
- Provide knowledge of a wide range of mathematical techniques and application of mathematical methods/tools in other scientific and engineering domains.
- Provide advanced knowledge on topics in pure mathematics, empowering the students to pursue higher degrees at reputed academic institutions.
- Strong foundation on topology and representation theory which have strong links and application in theoretical physics, in particular string theory.
- Nurture problem solving skills, thinking, creativity through assignments, project work.
- Assist students in preparing (personal guidance, books) for competitive exams e.g. NET, GATE, etc.

MSc I Semester (Mathematics)

Course Title :- (Paper-I) Advanced Abstract Algebra-I

Course Outcomes: After the completion of the course, students would be able to:

- Understand the concept of groups and class equations, Cauchy theorem. Determine the application of Sylow's theorems.
- Describe various types of series of group and Jordan holder theorem.
- Understand the concept of Solvable group and Nilpotent group in detail.
- Describe the notion of fields. Study Algebraic and transcendental extension& roots of polynomials.
- Describe various important aspects of field, Separable and inseparable extension.

Course Title :- (Paper-II) Real Analysis

Course Outcomes: After the completion of the course, students will be able to:

- Determine the Riemann-Stieltjes integrability of a bounded function and prove a selection of theorems concerning
- Determine the integration of vector valued functions. Learn rearrangement of terms of series. To study the rectifiable curve.
- Recognize the difference between point wise and uniform convergence of a sequence of functions. Illustrate the effect of uniform convergence on the limit function with respect to continuity, differentiability, and integrability, andIllustrate the convergence properties of power series.
- Understand the concept of functions of several variable, linear transformation, derivatives in R^n, Chain rule, Partial derivatives, Inverse function theorem.
- Understand the concept of Jacobians, extremum problems, Lagrange's multiplier, and differentiation of integrals, Implicit function theorem and Stoke's theorem.

Course Title :- (Paper-III) Topology-I

Course Outcomes: After the completion of the course, students would be able:

- To understand the concept of Countable and uncountable sets. Infinite sets and the Axiom of Choice Cardinal number and its arithmetic. Schroeder-Bernstein theorem. Cantor's theorem and the continuum hypothesis. Zorn's lemma. Well-ordering theorem.
- To understand the concept of definition and example of topological spaces Closed sets, Closure, Dense subsets, Neighborhoods, Interior exterior and boundary of sets. Accumulation points and derived set. Bases and sub-bases for topology, Subspace and relative topology.
- To understand the concept of alternate methods of defining a topology in terms of Kuratowski Closure Operation and Neighborhood Systems, continuous functions and homeomorphism.
- To learn and describe first and second countable spaces, Lindeiof's theorems, separable spaces, second countability and separability.
- To understand the concept of Path – connectedness, connected spaces, connectedness on real line components, locally connected spaces.

Course Title :- (Paper-IV) Complex Analysis-I

Course Outcomes: After the completion of the course, students would be able:

- To understand the complex integration, Cauchy Goursat theorem, integral formula, Higher order derivatives.
- Describe Morera's theorem, Cauchy's inequality, Liouville's theorem, the fundamental theorem of algebra, Taylor's theorem.

- To understand the concept of the maximum modulus principle. Schwarz lemma. Laurent series. Isolated singularities. Meromorphic functions. The argument principle. Rouche's theorem. Inverse function theorem.
- To understand the concept of Residues Cauchy's residue theorem. Evaluation of integrals. Branches of many valued functions with special reference to $arg\ z$, $log\ log\ z$.
- To understand the concept of bilinear transformations, their properties and classification, definitions and of conformal mappings.

Course Title :- (Paper-V) Advanced Discrete Mathematics-I

Course Outcomes: After the completion of the course students would be able to:

- Understand the concept of Semi groups, Monodies, Homomorphism and Isomorphism**.**
- Interpret Lattices, Lattices as partially ordered sets & their properties.
- To learn and revise Boolean Algebra, Karnaugh Map, Switching Circuits.
- Understand various definitions in graph theory and study their properties. Also, understand the shortest path problem and apply to a network.
- To understand the theory and techniques of trees and its uses.

MSc II Semester (Mathematics)

Course Title :- (Paper-I) Advanced Abstract Algebra-II

Course Outcomes: After the completion of the course, students would be able to:

- Understand the concept of Galois Theory, fundamental theorem of Galois theorem and fixed field.
- Describe the concept of Module and its types with example in detail.
- Determine Simple module, Semi-simple module and free module.
- Learn Noetherian and Artinian modules and Noetherian and Artinian rings and their example in detail.
- Explain Fundamental structure theorem of finitely generated modules and its application to finitely generated abelian groups

Course Title :- (Paper-II) Lebesgue Measure & Integration

Course Outcomes: At the end of this module students should be able to:

- Understand the construction and properties of Lebesgue measure, including the notion and properties of null set. Describe the notion of extended real valued and complex measures. Apply the notion of measurable functions and sets.
- Describe the notion of integration of non-negative functions, the general integral and integration of series.

- Understand the construction of the Lebesgue integral and know its key properties.Compute Lebesgue integrals using the Fundamental Theorem of Calculus, Lebesgue monotone and dominated convergence theorems and Fatou's Lemma.
- Describe the notion of convex set and convex function. Describe and apply Jenson's, Hölder's and Minkowski's inequalities and, Riesz representation theorem.
- Describe the notion of Dual space, Convergence in measure, Uniform convergence, almost everywhere convergence, Almost Uniform convergence.

Course Title :- (Paper-III) Topology-II

Course Outcomes: After the completion of the course, students would be able to:

- Understand the Separation axioms, their Characterizations and basic properties. Urysohn's lemma, Tietze extension theorem.
- Understand the Compactness. Continuous functions and compact sets. Basic properties of compactness. Compactness and finite intersection property. Sequentially and countably compact sets, Local compactness and one point compactification. Stone cech compactification. Compactness in metric spaces, Countable, compactness and sequential compactness in metric spaces, Connected, spaces. Connectedness on the real line, Components, Locally connected spaces.
- Describe Tychonoff product topology in terms of standard sub-base and its characterizations, Projection maps, Separation axioms and product spaces, Connectedness and product spaces, Compactness and product spaces (Tychonoff's theorem) Countability and product spaces
- Learn and revise the concept of Embedding and metrization, Embedding lemma and Tychonoff embedding, The Urysohn metrization theorem, Local Finiteness , Nagata Smirnov Metrization theorem , Para compactness'
- Learn and revise the concept of Net and Filters, Topology and convergence of nets Hausdorffness and nets, Compactness and nets. Filters and their convergence. Canonical way of converting nets to filters and vice-versa .Ultra - filters and Compactness.

Course Title :- (Paper-IV) Complex Analysis-II

Course Outcomes: After the completion of the course, students would be able to:

- Understand the concept of Weierstrass factorization theorem, Gamma and its properties, Riemann Zeta function, Riemann's functional equation.
- Describe and proove Runge's Theorem, Mittag-Leffler's theorem, Analytic continuation, Uniqueness of direct analytic continuation, Uniqueness of analytic continuation along a curve, Power series method of analytic continuation
- Understand the concepts of Schwartz reflection principle, Monodromy theorem and its consequences, Harmonic function on a disc.

- Learn to recognize Harnax inequality and theorem, Dirichlet problem, Green's function, Canonical products, Jenson's formula, Hadamard's three circles theorem, Order of an entire function, Exponent of convergence, Borel's theorem, Hadamard's factorization theorem.
- Understand the concept of the range of an analytic function, Bloch's theorem, the little Picard theorem, Schottky's theorem, Montel Caratheodary and great Picard theorem, Univalent function, Bieberbach conjecture and the 4-theorem.

Course Title :- (Paper-V) Advanced Discrete Mathematics-I

Course Outcomes: After the completion of the course students would be able to:

- Understand the concepts of Directed graphs, in degree and out degree of a vertex, weighted undirected algorithm, strong connectivity and algorithm of directed trees, search trees, tree traversals.
- Understand the concept computability theory-Finite State Machines and their Transition Table Diagrams, Equivalence of Finite State Machines. Reduced Machines. Homomorphism. Finite Automata. Acceptors
- Describe the notion of Non-deterministic Finite Automata and equivalence of its power to that of Deterministic Finite Automata. Moore and Mealy Machines.
- Describe the notion of Turing Machine and Partial Recursive Functions, Grammars and Languages Phrase-Structure Grammars, rewriting rules, derivations.
- Learn to recognize Sentential Forms, Language generated by grammar, Regular, Context-Free, and Context Sensitive Grammars and Languages, Regular sets, Regular Expressions and the Pumping Notions of Syntax Analysis, Polish Notations, Conversion of Infix Expressions to Polish Notations, The Reverse Polish Notation.

MSc III Semester (Mathematics)

Course Title: (Paper-I) Functional Analysis

Course Outcomes: After the completion of the course, students would be able to:

- Understand the concepts of convergence, completeness, continuous mappings, uniform continuity and space of continuous mapping. To be acquainted with the statement of the Baire's Theorem, Cantor's intersection theorem and its corollaries
- Learn to recognize the fundamental properties of normed spaces and of the transformations between them. To be acquainted with the statement of the Hahn-Banach theorem and its corollaries. To understand the notions of dot product and Hilbert space.
- Understand the concepts of Banachspaces, Hilbert spaces and conjugate spaces and to learn to classify the standard examples. In particular, spaces of sequences

and functions. Understand the concepts ofReflexive space and Natural embeddings.

- Learn to use properly the specific techniques for bounded operators over normed and Hilbert spaces.
- Prove Cauchy's Hölder's and Minkowski's inequalities, Open mapping theorem, Closed graph theorem, Uniform boundedness principle, Riesz, representation theorem.

Course Title :- (Paper-II) Advanced Graph Theory-I

Course Outcomes: After the completion of the course, students would be able to:

- Understand the concept of graph theoretic preliminaries, Operations on graphs, Graph Isomorphism disconnected graph and their Components, Traveling salesman problem, round table problem.
- Describe Eulerian and Hamiltonian Paths and circuits.
- Understand the concept of trees, Distance center, radius, diameter eccentricity and related theorems, Graph as metric space Rooted and binary trees.
- Understand the concept of Labelled graph and trees spanning tree, weighted spanning tree, Shortest path
- Understand the concept of fundamental cut sets, Rank and nullity, cut sets and cut vertices, fundamental cut sets.

Course Title: (Paper-III) Fuzzy Sets & Their Applications-I

Course Outcomes: After the completion of the course, students would be able to:

- Get idea of fuzzy set and membership function, Definition of a fuzzy set, membership function, and representation of membership function, General definitions and properties of fuzzy sets. Support, height, equality of two fuzzy sets, containment, examples.
- Understand the concept of Union and Intersection of two fuzzy sets, Complement of a fuzzy set , normal fuzzy set , α cut set of a fuzzy set , strong α - cut , convex fuzzy set , a necessary and sufficient condition for convexity of a fuzzy set (Theorem 1), Decomposition of fuzzy sets, Degree of subset hood. Level set of a fuzzy set. Cardinality, fuzzy cardinality, examples
- Describe the Other important operations on fuzzy sets, Product of two fuzzy sets, Product of a fuzzy set with a crisp number, Power of a fuzzy set. Difference of two fuzzy sets, Disjunctive sum of two fuzzy sets, example.
- Understand the concept of General properties of operations on fuzzy sets , Commutativity, associativity, distributivity, Idempotent law, identities for operations, Transitivity, involution, Demorgans laws , proofs and examples ,

Some important theorems on fuzzy sets , set inclusion of fuzzy sets and corresponding α - cuts and strong α - cuts (Theorem 1) .

- Describe comparison of α - cut and strong α –cut, Order relation of scalars a is inversely preserved by set inclusion of corresponding α-cuts and strong α-cuts , α-cut of union and intersection of two fuzzy sets, α- cut of complement of a fuzzy set (Theorem 2). Examples, α- cuts and strong α- cuts of union and intersection of arbitrary collection of fuzzy sets.

Course Title: (Paper-IV) Operations Research-I

Course Outcomes: After the completion of the course, students would be able to:

- Comprehend the origin and development of Operational Research, characteristics of Operational Research
- Understand the phase of Operational Research, uses and limitations of Operation Research.
- Design a LPP in real world objective and evaluate an optimal solution for linear programming problem by graphical method, graphical solution of property behaved L.P. problems,
- Frame and solve Linear programming Problem by Simplex Method, artificial variable techniques: Big M Method, two phase Method and problem of degeneracy.
- Correlate Linear Programming Problem to its corresponding dual LPP, General rules for converting any primal into dual, Fundamental theorem of duality.

Course Title :- (Paper-V) Integral Transform-I

Course Outcomes: After the completion of the course, students would be able to:

- Describe the notion of Laplace Transform, simultaneous ordinary differential equation and application of Laplace Transform in Differential Equation.
- Understand the concept of two and three-dimensional Laplace's Equation and related problems.
- Describe the notion of wave equation and learn the concept of two and three-dimensional wave equation.
- Explain the definition of Integral equation and problems related to integral equation.
- Describe the notion of heat equation and learn the concept of one and two dimensional heat conduction equation.

MSc IV Semester (Mathematics)

Course Title :- (Paper-I) Applied Functional Analysis

Course Outcomes: After the completion of the course, students would be able to:

- Understand the concepts of Cartesian and Tensor product of Hilbert spaces, Projection and Projection on a cone.
- Understand the concepts of Weak convergence, Weak compactness properties, Weak semi continuity and continuous linear functional.
- Apply the spectral analysis of compact self-adjoint operators to the resolution of integral equations.To apply the spectral theorem to the resolution of integral equations.
- Understand the concepts of Convex sets and Convex Programming, support functional, Minkowski functional and support mapping.
- Understand how to use the main properties of compact operators.

Course Title :- (Paper-II) Advanced Graph Theory-II

Course Outcomes: After the completion of the course, students would be able to:

- Understand the concept of connectivity and separability in graphs abstract graphs geometric graphs planar graphs, Kurtowski two graphs embedding and regions of a planar graphs, Detection of planarity
- Understand the concept of Geometric dual and combination dual.
- Learn and revise the concept of Coloring and covering of graphs, Chromatic, Polynomial chromatic partitioning Dimmer problem Domination sets independent sets, Four color conjecture.
- Learn and revise the concept of Digraph and types of digraphs. Digraph and binary relation Equivalence relation in a graph Directed path walk circuit and connectedness Euler and digraph, arborescence matrices A, B and C of digraphs.
- Understand the concept of Adjacency metric of a digraph, Algorithms, Kruskal algorithm, Prism algorithm, Dijkastra Algorithm.

Course Title :- (Paper-III) Fuzzy Sets & Their Applications-II

Course Outcomes: After the completion of the course, students would be abe to:

- Learn and revise the concept of Fuzzy sets, Basic Definitions, - level sets, Convex fuzzy set, Basic operations on fuzzy sets, types of fuzzy sets, Extensions: Types of fuzzy sets, Further operations on fuzzy sets. Cartesian product, Algebraic products, Bounded sum and Difference, t-norm and t-conorm.
- Learn and revise the concept of Extension principle and applications, Zadeh extension principle, images and inverse image of fuzzy sets, fuzzy numbers, algebraic operations with fuzzy number, extended operation and its properties, Special extended operation, addition, subtraction, product and division of fuzzy numbers.
- Understand the concept of Fuzzy relations on fuzzy sets, The union and intersections of fuzzy relations, composition of fuzzy relation, max-* and max-

product compositions , min-max composition and its properties, reflexivity, symmetry, transitivity and their examples, special fuzzy relations, similarity relation

- Understand the concept of Fuzzy graphs: Definition and Examples, Fuzzy sub-graph , Spanning sub-graph, path in a fuzzy graph, strength and length of a path, -length and –distances, connected nodes, fuzzy forest, fuzzy tree, Examples, Fuzzy Analysis: Fuzzy functions on fuzzy sets, classical function, fuzzy function, Examples.
- Learn and revise the concept of Fuzzy Logic: classical logic an overview, multi-valued logic, Fuzzy proposition unconditional and unqualified proposition, unconditional and qualified propositions, conditional and unqualified proposition, conditional and qualified proposition, Fuzzy qualifiers, Linguistics hedges An overview of classical logic. Its connectives, Tautologies, Contradiction Fuzzy.

Course Title :- (Paper-IV) Operations Research-II

Course Outcomes: After the completion of the course, students would be able to:

- Analyze and evaluate replacement problem.
- Formulate, apply and solve assignment problems so that cost is minimized.
- Frame and solve transportation problem.
- Develop a working knowledge of concepts and methods related to designing of networks, CPM-PERT, design, manage and complete projects in optimal time.
- Deduce the practicality of game theory and implement the techniques in real life perspective.

Course Title :- (Paper-V) Integral Transform-II

Course Outcomes: After the completion of the course, students would be able to:

- Learn and revise the concept of Laplace transform and study its application to Boundary Value Problems.
- Solve Electric circuit’s problems, heat conduction and wave equation, and application to Beams.
- Understand the concept of Fourier Transform.
- Learn various properties of Fourier, Transform and Parseval’s Identity.
- Describe Fourier Transform of the derivative, Finite Fourier Sine and Cosine Transform in detail.

DEPARTMENT OF BOTANY

B.Sc. (Botany)

Programme outcome BSc Botany:

Programmeoutcome:

PO1. Understanding of Plant Diversity and its importance in the maintenance of ecological balance.

PO2. Students learn to carry out practical work, in the field and in the laboratory, interpreting plant morphology and anatomy, Plant identification, Vegetation analysis techniques.

PO3. Apply the knowledge of basic science, and fundamental process of plants.

PO4. Apply modern techniques and instruments for Biochemical estimation, Molecular Biology, Biotechnology, Plant Tissue culture experiments, cellular and physiological studies of plants with an understanding of the applications in human life.

PO5. Apply the knowledge gained from the studies for the upliftment of society via addressing health, environmental issues, food scarcity etc.

Specific Outcome:

PSO1. Critical evaluation of ideas and arguments by collecting relevant information about the plants, so as to recognize their position in the classification systems and at phylogenetic level.

PSO2. Students will be able to access the primary literature, identify relevant works for a particular topic, and evaluate the scientific content of these works.

PSO3. Students will be able to compare and contrast the characteristics of the different groups of plants such as algae, fungi, bryophytes, pteridophytes, gymnosperms and angiosperms.

PSO4. Students will be able to use the evidence of comparative biology to explain how the theory of evolution offers the only scientific explanation for the unity and diversity of life on earth.

PSO5. Students will be able to explain how Plants function at gene, genome, cellular and tissue level,

PSO6. Students will be will be able to relate the physical features of the environment to the structure of populations, communities, and ecosystems.

PSO7. Students will be able to conceive the idea of artificial propagation of plants via vegetative methods and to find a livelihood via establishing miniature plant nurseries.

PSO8 Understand the habit of the angiosperm plant body.Know the vegetative characteristics of the plant.Learn about the reproductive characteristics of the plantand the plant morphology and basic taxonomy.

BSc I Year-(Botany)

Paper- I (Major)– Applied Botany

Course Outcomes:

After the completion of the course, students will be able to:

- Understand the significance and role of Botany.
- Learn the basic aspects of Applied Botany.
- Gain the knowledge about start up opportunities in the field of Botany.
- Get employment opportunities in the field of Botany.
- Learn about the opportunities of Social Science.
- Gain knowledge about best health practices.

Paper-II (Minor)–Basic Botany

Course Outcomes:

After the completion of the course, students will be able to:

- Understand the diversity among Algae.
- Know the systematic, morphology and structure of Algae.
- Understand the life cycle pattern of Algae.
- Understand the useful and harmful activities of Algae.
- Understand the biodiversity of Fungi.
- Know the economic importance of Fungi.
- Understand the morphological diversity of Bryophytes.
- Understand the economic importance of the Bryophytes.
- Know the taxonomic position, occurrence, structure, reproduction of Bryophytes.
- Become aware of applications of different plants in various industries.
- Highlight the potential of these studies to become an entrepreneur.
- Equip the students with skills related to laboratory as well as industry based studies.

BSc IInd Year - (Botany)

Course Title: (Major-Paper-I) Taxonomy and Embryology of Angiosperms

Course Outcomes:

- Gaining in depth knowledge of salient features of angiosperms, plant nomenclature, classification and understand the concept of origin and evolution of angiosperms, development of taxonomic tools in plants systematic.
- Understand the comparative account among the families of Angiosperms, economic importance, and systematic position of genera, species and families.
- Student will able to know at least 20 locally available families of flowering plants and its economic importance.
- Understand the structure of Anther, micros porogenesis and development of male gametophyte and structure of pistil, ovule, megasporogenesis and female gametophyte.

- Understand the reproduction of plants, haploid male and female gametes, fertilization of zygote and embryo formation, embryo development and endosperm.

Course Title:(Minor) Paper II – Plant Ecology, Biodiversity and phytogeography
Course Outcomes

- Students are able to know analyze various type of ecosystem correlate different ecosystem and understand concept of biogeochemical cycle.
- Students are able to know various ecosystems and plant distribution.
- Systematically understand biodiversity and its vital role in ecosystem function in depth studies on ecological parameter in biodiversity. Understand concept of characters and character weighing and concept of hotspot, mega diversity region of the world. Identification of rare, endangered and threatened species from the regions.
- Students are able to know analyze monitor various physical, Chemical and biological properties of soil, water and air.
- Understand phytogeography, the major plant communities of the world and different vegetation belts of the earth with characteristic climatic condition of the area.

BSc III Year - (Botany)

Course Title: Paper –I Plant Physiology
Course Outcomes:

After completion of the course-

- Students are familiar with various physiological aspects involved in the plant development.
- Students will come to know the importance of water relation of plant with respect to various plant physiological processes.
- Students will come to know about the role of mineral elements and bimolecular in plant development.
- Students will understand the importance of photosynthesis in plants. They will also understand photosynthesis is one of the most important processes that allow plants to live.
- Students will come to know that, energy produced by respiration is essential for normal functioning of body.
- Students will understand importance of metabolism to maintain living state of cells. They also understand role of nitrogen cycle in environment.
- Students will understand how enzymes serve important function in body, in digestion and metabolism. They have developed knowledge about pathways of water through xylem and phloem.

Course Title: Paper II – Cell Biology, Genetics and Biotechnology.
Course Outcomes

- The students will understand the cell as basic unit.

- They will understand the structure and function of various cell organelles.
- Students will be able to know about Genetic material and Heredity.
- They will be able to understand how cell divides and growth appears.
- Students will be able to learn about the basic concepts of Mendelian Genetics, its variation and application and also understand the Linkage, Crossing over, Mutation and structural and numerical changes in chromosomes and also learn experimental methods to solve genetic problems.
- Students will be able to understand cell at molecular level.
- Students will be able to understand how the genetic material DNA replicates, how DNA repair mechanism rectify DNA damage and how protein synthesize in the body and how Gene expression regulates in prokaryotic and eukaryotic organisms.
- Students will come to know how Biotechnology and Genetic Engineering concern with the manipulation of Genetic material for improvement of bioresources for human welfare.

MSc Botany

Programme Outcomes

- To a Botanist no plant is a weed. Conservation of biodiversity in the era of urbanization and industrialization should be the priority. After the completion of post-graduation course in Botany.
- Students will be able to know the value of natural wealth and their conservation. Also become aware about planting trees, their medicinal and industrial values, role of ethnobotany, and herbal medicines forhuman welfare.
- Students will understand the range of plant diversity in terms of morphology, anatomy, phylogeny, classification and their interrelationship. Also, will able to gather knowledge of biochemistry, physiology, cell biology, genetics, plant breeding and micro-propagation, tissue culture and horticulture.
- Students are able to think logically and organize task into a structured form and Assimilate knowledge and ideas based on wide reading and in digital platforms.
- Students will be able to perform/ carry out practical work, in the field and in the laboratory also learn techniques & practical skills like identification of algae, fungi, bryophytes, pteridophytes, gymnosperms, plant morphology and anatomy, angiosperm taxonomy, vegetation analysis techniques, physiochemical analyses of plant materials, physiology-biochemistry, cytology, Molecular biology genetics and plant Breeding.
- Student will be able to understand the impact of the plant diversity in societal and environmental contexts, and demonstrate the knowledge and requirement of sustainable development.
- Student will be able to how to plan and execute a project either individually or as a team and these experiences will be invaluable in long run.
- Students will be able to Create, select, and apply appropriate techniques, resources, and modern instruments and equipment’s for Biochemical estimation,

Molecular Biology, Plant Tissue culture experiments, cellular and physiological activities of plants with an understanding of the application and limitations.

- Use of different software enrich their communication skill and make them friendly to digital platform like Microsoft, Adobe acrobat, Adobe Photoshop, Google etc.
- Being students of natural science ethics is the key to protect our mother nature.

Program Specific Outcomes

On the completion of program, students will be specifically able to-

- Identify classify the plants by using the key characters.
- Prepare and view specimens for examination using light microscopy
- Use pure culture and selective techniques to isolate fungi, plant pathogens, algae and identify them growing on media.
- Qualitative and quantitative estimate the number of floral components by using enumeration and suitable sampling and techniques.
- Use appropriate plant molecular techniques and use of instrumentation realated to it.
- Practice safe laboratory procedures, using appropriate protective, biosafety and emergency procedures.
- Learn documentation and report writing on experimental protocols, results and conclusions, study tours and filed visits etc.

MSc I Sem

Course Title: Paper I – Biology and Diversity of Viruses, Bacteria and Fungi

Course Outcomes

After the completion of this course, students are expected to-

- Understand the basic microbial structure and study the comparative characteristics of prokaryotes.
- Be aware about diversity of microorganism.
- Gain knowledge about their beneficial and harmful activities.

Course title: - Paper II-Biology and Diversity of Algae

Course Outcomes

- This course aims to increase the understanding of the students about the diversity of lower plants, their classification, structure and growth. The students will develop understanding about the diversity, identification, classification and economic importance of lower plants.
- Students are able to: Understand the diversity among Algae. Know the systematic, morphology and structure, of Algae. Understand the life cycle pattern of Algae. Understand the useful and harmful activities of Algae
- To understand life cycles of different algal species. To explore economic importance of algae like Nostoc, Oscillatoria Chorella, Pandorina, Ulothrix, Chara Nitella

- To understand life cycles of different algal species. To explore economic importance of algae like Vaucheria, Pinnularia, and Cyclotella
- Understand the diversity among Algae. Know the systematic, morphology and structure, of Algae.
- Understand the life cycle pattern of Algae. Understand the useful and harmful activities of Algae like Ectocarpus, Sargassum, and Dictyota Laminaria. Polisiphonia.etc.

Course Title: (Paper III) Biology and Diversity of Bryophyta & Pteridophyta

Course Outcomes:-After the completion of the course, the students will be able to-

- Describe the ecological role of Bryophytes.
- Describe the vegetative and sexual reproduction in Bryophytes.
- Describe the economic importance of Bryophytes.
- Recall the unique evolutionary relationship of the Lycopodials, Selaginellales and Isoetales.
- Define the features of coal age Lycophytes tress and compare them with modern day members of the Lycopodiophyta.

Course Title: Paper IV - Biology and Diversity of Gymnosperms

Course Outcomes: After the completion of the course, the students will be able to-

- Develop the basic understanding of important characteristic, comparison with Angiosperms, economic importance and classification of Gymnosperm.
- Understand the various Fossils genera representing different fossil group.
- Know about morphological, anatomical and developmental patterns in Gymnosperms. Compare the main feature that defines the Cycadales, Cordaitable and Ginkgoales.
- Know about the reproductive parts their development and mechanism of reproduction and life cycle pattern.
- Understand the angiosperm like features found in same Gnetophyta taxa and these feature are analogous with similar structures found in flowering plants.

MSc II nd Sem. (Botany)

Course Title: Paper I – Taxonomy of Angiosperms.

Course Outcomes: After the completion of the course, the students will be able to-

- Gain in-depth knowledge of salient features of angiosperms, plant nomenclature, concept of taxonomy with identification, knowledge of secondary metabolites and its use in taxonomy. Understand development of taxonomic tools in plants systematic.
- Understand the various systems of classification and its merits and demerits. Understand origin and its various theories of angiosperms.
- Understand the concept and use of cladistics, phenotics and molecular tool in biodiversity studies.

- Understand the systematic position of genera, species, families and comparative account among the families of angiosperms. Students know the Economic importance of angiosperms plants.
- Know the comparative study of angiosperm plants and detailed studies on commonly growing families.

Course Title (Paper II) Morphology, Anatomy and Embryology of Angiosperms

Course Outcomes- After the completion of the course, the students will be able to-

- Understand the various morphological structures and evolution of flowers different placentations, floral development and Genetics. ABC model of flora development.
- Learn Interdisciplinary application- Histotaxonomy, Histochemistry, Physiological anatomy, Ecological anatomy will be useful for the students and they will be able to learn Root, Shoot apex, Root microbes interactions, Phytotaxy etc.
- Study anomalous Dicot stem and Monocot stem-Salvadora, Achyranthus, Chenopodium, Leptadenia, Nyctanthus, Bignonia and Dracia stem.
- Understand the Ecological Anatomy of different Xerophytes, Hydrophytes, Epiphytes and Parasite plant stem roots and leaf.
- Understand the structure of Anther and role of Gene expression during pollen development. They will get to know about fertilization and how Endosperm provides nutrition to Embryo development.

Course Title - Paper III – Plant Ecology

Course Outcomes: On completion of this course the students will be able to-

- Analyze various types of ecosystems, correlate different ecosystems.
- Understand the vegetative organization in community. Students will get to know about how changes take place during ecological succession.
- Develop knowledge about structure and function of ecosystem. They also will understand about biogeochemical cycle in environment and its role.
- Understand the effect of air, water and soil pollution in environment. They will also develop knowledge about greenhouse gases its sources and role.
- Get knowledge about invasive species of plant. They will get to know about how ecological management takes place.
- Develop knowledge about distribution of various plant species by quadrate Method.
- Know about the different biomes, vegetation, and botanical gardens and their roles, importance for lives.

Course Title: Paper IV – Cell Biology, Genetics and Plant Breeding

Course Outcomes: By successful completion of this course, student will be able to understand-

- The structural level of nucleic acids DNA and RNA and how the genetic material DNA replicates.

- The concept of gene and gene architecture understand the regulations of gene expression in Eukaryotes and also learn the basic of genetics and classical Genetics in prokaryotes covering bacterial / phage
- The molecular events of transcription and processing of transcripts, RNA aditing, spacing and transport.
- The molecular events of translation leading to Protein synthesis and post translational modifications, protein sorting and targeting of protein to organelles.
- The basic concept of gene mutation up to molecular level and how DNA repair mechanism rectify DNA damage and they will come to know about the diseases caused by genetic disorder.

MSc III Sem. - (Botany)

Course Title: Paper I – Plant Physiology

Course Outcomes-

After the completion of the course, the students will be able to-

- Familiar with various physiological aspects involved in the plant development.
- Know the importance of water relation of plant with respect to various plant physiological processes.
- Know about the role of mineral elements and bimolecular in plant development.
- Understand the importance of photosynthesis in plants. They will also understand photosynthesis is one of the most important processes that allow plants to Live.
- Know that, energy produced by respiration is essential for normal functioning of body.
- Understand the importance of metabolism to maintain living state of cells. They also understand role of nitrogen cycle in environment.
- Understand how enzymes serve important function in body, in digestion and metabolism. They have developed knowledge about pathways of water through xylem and phloem.
- Learn about Sensory photobiology, Stress physiology – Responses of plants to biotic and biotic stresses.
- Understand the role of various hormones, signaling compounds, thermodynamics and enzyme kinetics.

Paper II: Biochemistry of plant

Course Outcomes -

By the end of this course, the students will be able to:

- Undertake investigations and perform analyses that provide information about biochemical questions and help to solve biochemical problems.
- Demonstrate accurate quantitative analysis and computer literacy.
- Communicate Students completing the biochemistry major should:
- Frame a scientific question or problem.
- Effectively, through writing and oral communication, the results of scientific investigations.

- Understand and effectively apply scientific ethics.
- Locate, obtain, read, and understand appropriate scientific literature.
- Evaluate scientific arguments critically.

Paper lll: Molecular Biology of Plants & Plant Breeding

Course Outcomes -

By the end of this course, the students will be able to:

- Understand and concepts in prokaryotic, eukaryotic, and viral genetics.
- Explain central dogma of molecular biology (replication, transcription, and translation).
- Explain types of mutation, gene regulation and transposable element.
- Learn about Laboratory Techniques viz. Microscopy, SEM & TEM, Ultra centrifugation, fractionation, Electrophoresis, PCR, GISH, FISH and Immunochemical techniques.
- Isolation of plant DNA and its quantification.
- Isolation of RNA and its quantitation
- Gain knowledge on the organization of genes and chromosomes.
- Study about the structure of atoms, molecules and chemical bonds & Composition, structure and function of biomolecules

Course Title: Paper IV– Conservation and Utilization of Plant Resources

Course Outcomes-

- Students will be able to explain the range of plant diversity in terms of structure, function and environmental relationships.
- The evaluation of plant diversity. The role of plants in the functioning of the global ecosystem.
- A selection of more specialized, optional topics. Statistics as applied to biological data.
- Apply ethical principles and commit to environmental ethics and responsibilities and norms of the biodiversity conservation. Students will be able to explain the ecological interconnectedness of life on earth by tracing energy and nutrient flow through the environment. They will be able to relate the physical features of the environment to the structure of populations, communities.
- They understand the pattern origin, diversification and cultivation of plants in nature. They are able to design the strategies for conservation of these natural resources. They become well worst with the role and functions of various organizations.
- They introduce the concepts and principles of BSI, CSIR, ICAR, DBT they gain knowledge and work of these.
- They are able to understand the designing and function of remote sensing and their application. They gain knowledge of Indian remote sensing resources.

M Sc. IV Semester (Botany)

Course Outcomes -

Paper I: Biotechnology, Tissue culture and Genetic Engineering

- Understand various tools and techniques used in genetic engineering.
- Demonstrate the strategies and measures for manipulation of genome by incorporating desirable genes pertaining to specific traits.
- Acquire knowledge about different methods for genetic transformation of plants
- Understand patent, copyright and trademark, the acts and policies in India and abroad

Paper ll: Instrumentation, Biostatistics, and Biotechniques

By the end of this course, the students will be able to:

- Learnt to use modern instrumentation and classical techniques.
- Understand basic principles and phenomena in the area of techniques and instrumentation required for biological studies.
- Independently work on various instruments and understand their principle.
- Prepare various types of solutions and calculate, etc
- This paper teaches basic of various types of techniques and instrumentation such as spectrophotometry, chromatotgraphy, electrophoresis, and current molecular techniques to carry out routine and advance research in Botany/Life Science.
- Emphasis is on principle of the technique, instrumentation design, methodology of sample preparation and handling of equipment and application of the technique in the field of Botany.

Paper III: Ethnobotany:

By the end of this course, the students will be able to:

- Bring out the relevance of ethnobotany in the present context.
- Know about the major and minor ethnic groups or Tribals of India, and their life styles.
- Learn about the Methodology of Ethnobotanical studies.
- Gain knowledge on the role of Role of ethnobotany in modern Medicine.
- Get awareness on the conservation practices of medicinal plant.

Paper IV: Applied Mycology

By the end of this course, the students will be able to:

- Identify the distribution of fungi in nature.
- List the positive and the negative roles of fungi in life.
- Discuss the systematic classification of fungi.
- Describe the general characters of fungi
- Use of needed precautions when dealing with pathogen microorganisms
- Demonstrate professional attitudes and behaviors towards others.
- Propose the smart questions
- Understand and dissecting the problem so that it is fully solved understood.
- Demonstrate the assertiveness for his decision.

Name of Program: Bachelor of Science in Biology

B Sc (Biology)

Course Code - C085

Programme Specific Outcomes (PSOs) BSc Biology

After completing BSc (Biology) program students will:

- Demonstrate a broad understood of animal diversity, including knowledge of the scientific classification and evolutionary relationships of major groups of animals.
- Recognize the relationships between structure and functions at different levels of biological organization (e.g., molecules, cells, organs, organisms, populations, and species) for the major groups of animals.
- Characterize the biological, chemical, and physical features of environments (e.g., terrestrial, freshwater, marine, host) that animals inhabit.
- Explain how animals function and interact with respect to biological, chemical and physical processes in natural and impacted environments.
- Explain how organisms function at the level of the gene, genome, cell, tissue, organ and organ-system. Drawing upon this knowledge, they are able to give specific examples of the physiological adaptations, development, reproduction and behavior of different forms of life.
- Understand the applied biological sciences or economic Zoology such as Sericulture, Apiculture, and Aquaculture, Industrial microbiology, RDNA technology and medicine for their career opportunities.

Programme Outcomes (POs): BSc Biology

- Students will be able to develop critical thinking about subj subject.
- Students will be able to learn various aspects of the subject.
- Students will be able to learn various techniques of the subject.
- Students will be able to use various application of the subject.
- Students will be able to deliver knowledge about the subject.
- Students will be able to produce knowledge for the larger interest of the society.

BSc First Year (Biology)

Course Title: (Paper I)

Course Title: (Paper II) Cell Biology and Developmental Biology

Course Outcomes:

- To understand the structure of cells and cell organelles in relation to the functional aspects and understanding of the working principles and applications of microscopes.
- To describe the composition of prokaryotic and eukaryotic cells.
- To understand the structure and functions of chromosome; mitotic and meiotic cell divisions and their significance.

- To understand the properties and treatment of cancer cells. Described the principle and applications of pH meter, centrifuge, chromatography and electrophoresis.
- To understand the process of development of animals.
- To understand the process of organogenesis of selected organs, development of extra embryonic membrane and the nature and physiology of placenta.
- To know the inducer and inductor role in embryogenesis and knowledge about metamorphosis and the process of regeneration.

Course Title: (Lab) Invertebrates, Cell Biology and Developmental Biology
Course Outcomes:

- To understand the anatomy and physiology of invertebrate animals by dissection.
- To describe the structural study and mounding of organs.
- To know the rules of taxonomy and the principle of animal classification.
- To understand the diversity morphology, biological characters and taxonomical importance some selected museum specimens of different animal groups.
- To know the internal skeletons and osteology of different bone structures.

BSc Second Year (Biology)

Course Title: (Paper I) Vertebrate and Evolution
Course Outcomes:

- Identify the taxonomic status of the entire chordates and discussed the evolutionary model of the group.
- Impart the knowledge on ecology of some important fishes, amphibians reptiles, birds and mammals.
- Impart knowledge in comparative anatomy and development systems of chordates.
- Make able to discuss some and very important phenomena in Chordates.
- Know about the conservation and management strategies of the chordate fauna.
- Understand the theories of evolution and highlighted the role of evidences in support of evolution.
- Describe the evolutionary knowledge through the concepts of coloration and mimicry.

Course Title: (Paper II) Animal Physiology and Biochemistry
Course Outcomes:

- Understand about the composition of food and mechanism of digestion absorption and assimilation.
- Attain knowledge of respiration and excretion and understood the mechanism of transport of gages and urine formation.
- Describe the mechanism of circulation and composition of blood.

- Getting knowledge of neuromuscular coordination and the mechanism of osmoregulation in animals and endocrine system and their function is attained.
- Understand the menstrual cycle and the role of contraceptive in population control.
- Comprehend the energy source, chemical bonds and the principles of thermodynamic understood the importance of acid base balance.
- Attain the knowledge of macromolecule such as carbohydrates, protein and fat, their types and significance.
- Understand the knowledge of cholesterol and its biological significance.
- Describe the enzymes, mechanism of enzyme action and factors affecting the enzyme activity
- Understand the types and importance of vitamins.

Course Title: (Lab) Vertebrate and Evolution and Animal Physiology and Biochemistry
Course Outcomes:

- Obtain the knowledge about direct observation of fossils and evolutionary important specimen by which evolutionary relationship of animal groups.
- Attain knowledge of qualitative analysis of macromolecules, excretory products, blood glucose and cholesterol.
- Understand the enzyme reaction and influence of temperature on enzyme action.
- Skill development for the observation of blood cells and haemin crystals.
- Understand the working principle and applications of physiological instruments.
- Attain knowledge on the observation of preserved specimens and instruments of sericulture and fisheries.
- Understand the techniques of differentiation of haemolymph and blood
- Observ of preserved specimens and instruments
- Comprehend the physico- chemical nature of water through estimation of its chemical compounds.
- Understand the nature and functional aspects of intra specific association of animals.

B Sc Third Year (Biology)

Course Title: (Paper I) Genetics
Course Outcomes:

- Understand the theories of classical genetics and blood group inheritance in man.
- Describe the genetic variation through linkage and crossing over, chromosomal aberrations and sex determination.
- Understand the genetic defects and inborn errors of metabolism and genetic counseling and role of inbreeding and out breeding.
- Understand the molecular structure of genetic materials and understood the mechanism of gene expression and regulation character formation.

Course Title: (Paper II) Ecology and Applied Biology

Course Outcomes:

- Understand and appreciate the environment and ecological services of life on earth.
- Understand the biotic factors of environment and biogeochemical cycle and intra specific relationships of animals.
- Acquire knowledge of ecosystem, food chain, energy flow and productivity and understood pond as a model ecosystem.
- Impart knowledge of habitat ecology, pollution and bioremediation of polluted environment.
- Understand the various types and methods of aquaculture practices.
- Understand the physiology and reproductive mechanisms of important fishes.
- Understand the culture of mulberry plants.
- Know about the culture methods of B.mori and mulberry silk.
- Describe the diseases and pests of B.mori.
- Study the quality of silk, silk gland and marketing strategies of silk.

Course Title: (Lab) Genetics and Ecology and Applied Biology

Course Outcomes:

- Understand the inheritance of Mendelian traits by direct observation among students.
- Acquire knowledge skill development and observation of blood group identification and pedigree chart preparations
- Understand of the mechanism of phenotypic expression in Drosophila.
- Gain genetic knowledge on the observation of specimens and models.
- Comprehend the physico- chemical nature of water through estimation of its chemical compounds.
- Understand the nature and functional aspects of intraspecific association of animals.

DEPARTMENT OF ZOOLOGY

Program Outcomes, Program Specific Outcomes and Course Outcomes

The Department is having the following objectives:

- To provide quality education in a branch of Biological sciences i.e. Zoology with different specializations.
- To facilitate Higher education & research in zoology.
- To provide quality education offering skill based programs and motivate the students for self employment in applied branches of Zoology.
- To inculcate the spirit of resource conservation and love for nature
- To conduct field studies and different projects of local and global interests.
- To provide opportunities for professional and personal development through curricular and co- curricular activities.
- Provide consultancy and organize extension activities.

Name of Program: Bachelor of Science in Biology

Course Code - C085

Programme Specific Outcomes (PSOs) B Sc

After completing B Sc (Biology) programme students will:

- Demonstrate a broad understood of animal diversity, including knowledge of the scientific classification and evolutionary relationships of major groups of animals.
- Recognise the relationships between structure and functions at different levels of biological organization (e.g., molecules, cells, organs, organisms, populations, and species) for the major groups of animals.
- Characterise the biological, chemical, and physical features of environments (e.g., terrestrial, freshwater, marine, host) that animals inhabit.
- Explain how animals function and interact with respect to biological, chemical and physical processes in natural and impacted environments.
- Explain how organisms function at the level of the gene, genome, cell, tissue, organ and organ-system. Drawing upon this knowledge, they are able to give specific examples of the physiological adaptations, development, reproduction and behavior of different forms of life.
- Understand the applied biological sciences or economic Zoology such as Sericulture, Apiculture, and Aquaculture, Industrial microbiology, RDNA technology and medicine for their career opportunities.

Programme Outcomes (POs): BSc

- Students will be able to develop critical thinking about subject.
- Students will be able to learn various aspects of the subject.
- Students will be able to learn various techniques of the subject.
- Students will be able to use various application of the subject.
- Students will be able to deliver knowledge about the subject.
- Students will be able to produce knowledge for the larger interest of the society.

B Sc First Year

Course Title: (Paper I) Invertebrate

Course Outcomes:

- To know the basic concepts of biosystematics and procedure in taxonomy.
- Identify the taxonomic status of the entire non-chordates up to annelids and discuss the evolutionary model of the group.
- Describe the general biology of few selected non-chordates useful to mankind.
- Know about some of the important and common protozoans, helminthes of parasitic nature causing diseases in human beings.
- Understand the importance of metamerism in annelids.
- Understand the diversity and classification and functional aspects of different systems of phylum Arthropoda, Mollusca and Echinodermata.
- Describe the social life and economic importance of insects.
- Understand the physiology of pearl formation and pearl oyster formation.
- Describe the advanced characteristic features of cephalopod molluscs.
- To know the resemblance and evolutionary significance of larval forms of echinoderms.

Course Title: (Paper II) Cell Biology and Developmental Biology

Course Outcomes:

- Understand the structure of cells and cell organelles in relation to the functional aspects and understanding of the working principles and applications of microscopes.
- Describe the composition of prokaryotic and eukaryotic cells.
- Understand the structure and functions of chromosome; mitotic and meiotic cell divisions and their significance.
- Understand the properties and treatment of cancer cells. Described the principle and applications of pH meter, centrifuge, chromatography and electrophoresis.
- Understand the process of development of animals.
- Understand the process of organogenesis of selected organs, development of extra embryonic membrane and the nature and physiology of placenta.

- Know the inducer and inductor role in embryogenesis and knowledge about metamorphosis and the process of regeneration.

Course Title: (Lab) Invertebrates, Cell Biology and Developmental Biology

Course Outcomes:

- Understand the anatomy and physiology of invertebrate animals by dissection.
- Describe the structural study and mounding of organs.
- Know the rules of taxonomy and the principle of animal classification.
- Understand the diversity morphology, biological characters and taxonomical importance some selected museum specimens of different animal groups.
- Know the internal skeletons and osteology of different bone structures.

BSc Second Year

Course code – S2- ZOOL1T

Course title- Diversity of Chordates and Comparative Anatomy (Paper – I)

Course type :- Core Course

Course learning outcomes :-

On completion of this course, learners will be able to:-

1. Understand chordate diversity of animals and their taxonomic position.
2. Identify the morphological and Anatomical features and basis of chordate classification.
3. Know economic importance and present status that will develop positive attitude towards
4. conservation of Biodiversity.
5. Differentiate the organism belonging to different taxa by studying comparative anatomy.
6. The project, assignment will give them a flavor of research in studying biodiversity,
7. taxonomy besides improving their writing skills and lay foundation of career in Zoology.

Course code – S2- ZOOL2T

Course title* :- Physiology and Biochemistry *(Paper – II)

Course type :- (Core Course / Elective/ Generic Elective /Vocational …….)

Course learning outcomes :-

Upon completion of the course student will be able to

1. Understand how organs function at different levels i.e. from cellular to system level.
2. Examine internal harmony of different body systems by learning inherent disorders and

3. deficiencies, which is needed to maintain good health.
4. Understand functions of biomolecules and their role in metabolism by studying biochemistry Develop strong foundation for Research and employability skills.
5. Improve the student's perspective of health Biology through deep study of physiology.

BSc Third Year (Biology)

Course Title: (Paper I) Genetics
Course Outcomes:

- Understand the theories of classical genetics and blood group inheritance in man.
- Describe the genetic variation through linkage and crossing over, chromosomal aberrations and sex determination.
- Understand the genetic defects and inborn errors of metabolism and genetic counseling and role of inbreeding and out breeding.
- Understand the molecular structure of genetic materials and understood the mechanism of gene expression and regulation character formation.

Course Title: (Paper II) Ecology and Applied Biology
Course Outcomes:

- Understand and appreciate the environment and ecological services of life on earth.
- Understand the biotic factors of environment and biogeochemical cycle and intra specific relationships of animals.
- Acquire knowledge of ecosystem, food chain, energy flow and productivity and understood pond as a model ecosystem.
- Impart knowledge of habitat ecology, pollution and bioremediation of polluted environment.
- Understand the various types and methods of aquaculture practices.
- Understand the physiology and reproductive mechanisms of important fishes.
- Understand the culture of mulberry plants.
- Know about the culture methods of B.mori and mulberry silk.
- Describe the diseases and pests of B.mori.
- Study the quality of silk, silk gland and marketing strategies of silk.

Course Title: (Lab) Genetics and Ecology and Applied Biology
Course Outcomes:

- Understand the inheritance of Mendelian traits by direct observation among students.
- Acquire knowledge skill development and observation of blood group identification and pedigree chart preparations
- Understand of the mechanism of phenotypic expression in Drosophila.
- Gain genetic knowledge on the observation of specimens and models.
- Comprehend the physico- chemical nature of water through estimation of its chemical compounds.

- Understand the nature and functional aspects of intraspecific association of animals.

Master of Science in Zoology (MSc Zoology)

Course Code: C056
Duration: 2 Years (Four Semesters)
The primary objective of the program is to impart quality education in the subject of Zoology as a basic science and its applied branches to the students.
Programme Outcomes (M.Sc. Zoology)

- The programme works across related majors within the M.Sc zoology
- Distinguish between the structure, function, behaviour and evolution of different animals.
- For instance if you major in zoology, you can also still take courses from across the other complementary.
- Master of Science majors of conservation biology and ecology, giving you an in-depth knowledge of those most closely related programmes.
- Apply the wide range of subject based skills to various fields that provide a base for future career in disciplines such as Health Sciences, Agriculture, Environmental Management, Biotechnology, Publishing, Teaching and Research Perform,
- Assess and implement practical techniques and procedure to solve biological problems and analyse and quantify data collected during any project.
- Understand the applications of Biological techniques to various fields of biology.
- When you graduate with a Master of Science (Zoology) you will have learned how to work at a high level of academic achievement.
- Work to deadlines under pressure and communicate effectively.

MSc Zoology I-Semester

Course Title: (Paper-I) Biosystematics, Taxonomy and Evolution
Course Outcomes:

- Classify animals on the basis of their relation to other animals by body structure, external characters, development and DNA.
- Apply the International rules of Nomenclature to give a scientific name to animals which are found during research.
- Understand the gradual development and evolutionary history of different kinds of living organisms from earlier forms over several generations
- Understand and demonstrate the internal anatomy of various animals, biodiversity and related indices.

Course Title: (Paper-II) Structure & Function of Invertebrates
Course Outcomes:

- Understand the structure and organization of invertebrate animals.
- Explain modifications in various functions of animals during transition from invertebrates to vertebrates.
- Discuss the evolutionary significance of larval forms of invertebrates.
- Identify invertebrates and homology, analogy and modifications of mouthparts in relation to feeding habits.

Course Title: (Paper-III) Quantitative Biology, Biodiversity and Wildlife
Course Outcomes:

- To understand quantitative approaches and technologies involved in research.
- To identify diversity of fauna on earth and implement conservation measures to save diversity
- To understand importance of wildlife and conservation measures, National parks and Sanctuaries.
- Analyse biological data mathematically and statistically.

Course Title: (Paper-IV) Bimolecular and Structural Biology
Course Outcomes:

- To explain Biomaterial, Nanoparticles and their importance.
- To understand biological reactions, structure of protein, carbohydrates fats, nucleic acids and their metabolism.
- To develop a knowledge of enzymes and mechanism of their action in various biological reactions.
- To understand the process of gene expression & protein synthesis.

M.Sc. Zoology II-Semester

Course Title: (Paper-I) General and Comparative Animal Physiology and Endocrinology
Course Outcomes:

- Understand all physiological processes of vertebrates & analyse them biochemically
- Correlate the comparative physiology of the systems and understand their regulation & control
- Compare the structure, functions and regulation of the receptor organs of vertebrates
- Understand the structure, function and regulation of endocrine & neuroendocrine glands,

Course Title: (Paper-II) Population Ecology and Environmental Physiology
Course Outcomes:

- Understand population and its characters and regulation.
- Correlate physiological adaptations to environment and pollution, control measures for environmental degradation. as well as risk factors to human health.
- Understand limiting factors, predator-prey relationships and physiological responses of the body to environment.
- Demonstrate the methods of relaxation of Stress and body by Yoga, Meditation, Asana & Pranayam.

Course Title: (Paper-III) Tools and Techniques in Zoology
Course Outcomes:

- Explain Microscopy, Colorimetry, Chromatography principle, process, applications and working of related instruments.
- Demonstrate Microbiological, Cytological, Histological, Molecular biological techniques.
- Apply and demonstrate Immunological Surgical Immunodetection and Cell culture techniques.
- Understand Cryopreservation, Radioisotope and Isotope techniques and applications of all the techniques in biology.

Course Title: (Paper-IV) Molecular Cell Biology and Genetics
Course Outcomes:

- Explain Biomembranes and the processes of Cell-cell signalling and cell-cell adhesion.
- Understand the process of Sex determination and details of Human chromosomes & Human chromosome project.
- Understand gene libraries, Transgenic and Knockout animals.
- Understand various genetic processes and their applications to biological systems.

M.Sc. Zoology III-Semester

Course Title: (Paper-I) Comparative Anatomy of Vertebrates
Course Outcomes:

- Knowledge of origin, evolution and general organisation of Chordates.
- Knowledge of evolution of heart, lungs and urino-genital organs of vertebrates.
- Knowledge of comparative anatomy of all systems of vertebrates.
- Knowledge of flight and aquatic adaptations in birds and mammals.

Course Title: (Paper-II) Limnology
Course Outcomes:

- Knowledge of morphometry, physico-chemical and biological characteristics of fresh water bodies.

- An understanding of the significance of aquatic flora, fauna, insects, birds and macrophytes in water bodies.
- Knowledge of pollution of rivers causes and control measures.
- Knowledge of legislation and regulation on discharge of industrial effluents and domestic wastes in rivers and reservoirs.

Course Title: (Paper-III) Ecotoxicology
Course Outcomes:

- To develop an understanding of environmental biology, productivity and pollution.
- To develop knowledge of Toxicity of foods, pesticides and agrochemicals among younger.
- To know public health hazards due to natural disasters and occupation.
- To know the process of recycling and reuse technologies of solid and liquid waste.

Course Title: (Paper-IV) Animal Behavior and Neurophysiology
Course Outcomes:

- Understand neurophysiology of perception memory, domestic animal and human behaviour.
- Analyse processes at different levels and neurophysiology of sensory processing of animal behaviour.
- Classify behavioral patterns, communication, learning and memory.

Course Title: (Paper-V) Aquaculture
Course Outcomes:

- Develop knowledge of farming of aquatic organisms for increasing food production and animals beneficial to human.
- Observe culture techniques, farm management and hatchery operations.
- Analyse harvesting and marketing strategies.
- Understand the technique of fish preservation and Water quality monitoring techniques.

Course Title: (Paper-VI) Gamete Biology Development and Differentiation in Vertebrates
Course Outcomes:

- Understand reproductive physiology and development in mammals
- Develop a deep knowledge of the role of endocrine secretion in regulation of reproductive cycle.
- Understand the process of differentiation of eggs and sperms before fertilization.
- Develop knowledge of cryopreservation technique and stem cell disorders.

Course Title: (Paper-VI) Fish Structure and Function

Course Outcomes:

- Know the functional anatomy of all organ systems of fish
- Understand migration and adaptations in fishes.
- Observe the phenomenon of Parental care in various fishes and importance of electric organs in fishes.
- Understand the significance of Coloration, luminous and poisonous organs of fish.

Course Title: (Paper-VII) Pisci-Culture and Economic Importance of Fishes (Ichthyology

Course Outcomes:

- Differentiate between natural and induced breeding in fish.
- Manage hatcheries and fish farm in future.
- Develop technical knowledge of fish preservation and Shark liver oil industry.
- Identify fish by morph metric and meristic characters and apply the method in biodiversity oriented research.
- Explain and apply genetic engineering in fishery technology.

DEPARTMENT OF PHYSICS

BSc (Physics)

Programme specific outcomes

At the end of the program:

PSO1	Understand the core concept of Physics subjects and acquire analytical and logical skill for higher Education.
PSO2	Students will demonstrate proficiency in mathematical concepts needed for a proper understanding of physics.
PSO3	Students will demonstrate knowledge of classical mechanics, optics, thermodynamics, electromagnetism, quantum physics, solid state physics, spectroscopy, and modern physics, and apply this knowledge to analyze a variety of physical phenomenon.
PSO4	Students learned laboratory skills, organizational skills and working in group.
PSO5	Students get acquainted with techniques which are useful in industry and get conceptual knowledge of entrepreneurships through the co-curricular activities

Programme outcomes

At the end of the program:

PO1	The students will develop a strong analytical skill and will be able to study critically a physics problem.
PO2	They will develop a good communication skill such that they can explain complicated physics technical terminologies in simple manner
PO3	They will be able to carry out experiments to understand the laws and concepts of Physics.

PO4	They will be aware of their ethical and moral values and not practice fabrication and plagiarism.
PO5	They will know of their responsibility of preserving our environment and society.

BSc I Year (Physics)

Course Title: (110175), Thermodynamics and statistical physics. (Major, Paper-I) NEP

Course Outcome: After completing the course, the student should be able to

CO1	The course would enable the students to understand the basic Physics of heat and temperature in relation to energy, work, radiation and matter.
CO2	The students are expected to learn that "how laws of thermodynamics are used in a heat engine to transfer heat into work".
CO3	This course will also develop an understanding of the various concept of statistics and the methods to apply them in thermodynamics.
CO4	Students will understand the importance of studying statistical mechanics with the behavior of particles under classical and quantum conditions.

Course Title: (110176), Mechanics and properties of matter. (Major, Paper-II/Minor/Elective) NEP

Course Outcome: After completing the course, the student should be able to

CO1	The course would empower the students to develop the idea about the behavior of physical bodies.
CO2	It will provide the basic concepts related to the motion of all the objects around us in daily life.

CO3	The students would be able to build foundation to various applied field in science and technology especially in the field of mechanical engineering.
CO4	The students will acquire the knowledge of basic mathematical methods to solve the various problem in physics.
CO5	The students will be able to understand the relativistic effect and the relation between energy and mass.

Course Title: - (110175), Thermodynamics and statistical physics. (Major, Paper-I, Practical) NEP

Course Outcome: After completing the course, the student should be able to

CO1	The students would gain practical knowledge about heat and radiation by performing various experiments.
CO2	The students will acquire knowledge about the different forms of distribution of subatomic practices in the system using statistical methods.
CO3	The students will be able to use various thermo dynamical instruments in daily life.

Course Title: -(110176), Mathematical Physics, Mechanics and properties of matter. (Major, Paper-II/Minor/Elective-Practical) NEP

Course Outcome: After completion of the course, the students should be able to

CO1	The students would acquire basic practical knowledge related to mechanics through the experiments.
CO2	Students will be familiar with various measurement devices by which they can measure various physical quantities with accuracy.
CO3	The students will develop the concept related to the mechanics and properties of matter.

BSc II Year (Physics)

Course Title: - (210338), Waves and Optics. (Major, Paper-I) NEP

Course Outcome: After completing the course, the student should be able to

CO1- Developing an understanding of various aspects of harmonic oscillators and wave specially superposition of collinear and perpendicular harmonic oscillations.

CO2- Explain several phenomena of daily life that can be explained as wave phenomena.

CO3- Understand various optical phenomena, principles, working and applications.

CO4- Use the principle of wave motion and superposition to explain the physics of polarization, interference and diffraction.

Course Title: - (210339), Electricity, Magnetism and Electromagnetic theory. (Major, Paper-II/Minor/Elective) NEP

Course Outcome: After completion of the course, the students should be able to.

CO1	Understand the basic concepts of electricity and magnetism and their applications.
CO2	Apply various network theorems and their application in electronic, electrical circuit analysis, and electrical machine.
CO3	Understanding the construction and working of ballistic galvanometer and cathode ray oscilloscope.
CO4	Understanding the concept of electromagnetic wave and their reflection and refraction from a plane surface.

Course Title: - (210340), Wave and Optics (Major, Paper –I) Practical, NEP

Course Outcome: After completing the course, the student should be able to

1. Study waves and their superposition using cathode ray oscilloscope.?
2. Explain various optical properties like interference diffraction and polarization. ?
3. Use various optical instruments like telescope, grating, spectroscope, polarimeter etc. in daily life. ?
4. Students will observe the experimental evidences of theoretical concepts of their syllabus.?

Course Title: - (210339), Electricity, Magnetism and Electromagnetic theory. (Major, Paper-II/Minor/Elective- Practical) NEP

Course Outcome: After completion of the course, the students should be able to.

CO1	Verify various laws in electricity and magnetism such as Lenz's law, Faraday's law.
CO2	Understanding the construction, working and uses of various measuring instruments.
CO3	Verify various network theorems. Using simple electric circuit.

BSc III Year (Physics)

Course Title: - (310338), Quantum mechanics and spectroscopy. (Paper-I)

Course Outcome: After completion of these course students should be able to.

CO1 Understand De-Broglie hypothesis and Uncertainty principle, Derive Schrodinger's time dependent and independent equations.

CO2 Solve the problems using Schrödinger' equations.

CO3 To understand atomic spectra of atom, Zeeman effect and characteristics of X-rays.

CO4 To understand molecular spectra of atom, Raman effect and elementary concept about NMR,EPR.

CO5 Basic idea about nuclear physics and elementary particles.

Course Title: - (310339), Solid state physic and devices. (Paper-II)

Course Outcome: After completion of these course students should be able to.

CO1	This course will introduce the students to different aspects of classical mechanics like constraints and their classification.
CO2	Learn the concepts needed for the important formalism of lagrange's equations and derive the equations using D'Alembert's principle.
CO3	Describes the concept of Hamilton's principle and their applications, solve the problem of particle moving under a central force.
CO4	Define and discuss the concepts of canonical transformation and generating functions, kepler's problem, poissons brackets and poisons theorem.
CO5	Student will understand the basic properties of 4- vectors and 4- scalars. Explain the symmetries of space and time, Relativistic generalization of newton's laws.

Course Title: - (310340), Physic Practical

Course Outcome: After completion of these course students should be able to.

CO1	The Student would gain practical knowledge about electricity and magnetism, and measurement Such as; Resistance, Voltage Current etc.
CO2	The student will gain experimental knowledge of characteristics of p n junction diode and zener diode and light emitting diode.
CO3	The student will gain experimental knowledge of Half wave rectifier and Full wave rectifier and determine ripple factor and efficiency.
CO4	The student will gain experimental knowledge of characteristics curve and working of transistor in common base and common emitter mode
CO5	The student will gain experimental knowledge of characteristics curve of

	field effect transistor.
CO6	The student will gain experimental knowledge to find the energy band gap of semiconductor by using reverse saturation current.

MSc (Physics)

Programme specific outcomes

At the end of the program:

PSO1	Understanding the basic concepts of physics: particularly concept in classical, statistical, and quantum mechanics, electrodynamics and Plasma, nuclear and particle physics, Atomic and molecular, condensed matter physics, and their applications.
PSO2	The students would gain substantial knowledge in various branches of physics: electronics, Laser, optical communication, and advanced studies in material science.
PSO3	The course would empower the students to acquire scientific and engineering skills and the required practical knowledge by performing experiments in laser optics, nuclear physics, electronics, and characterization of materials.
PSO4	The program also provides adequate exposure to the students for pursuing higher education (M.Tech., M.Phil./PhD) and get job opportunities in higher education, research organization (IITs, BARC, DRDO, IISc, ISRO, NPL, NASA), Industries and get professional options in any interdisciplinary area related to physics.
PSO5	With successful completion of this program the students understand diverse phenomena observed in nature follow from a small set of fundamental law and students will have the scientific outlook and lifelong learning attitude.

Programme outcomes:

PO1	Apply the skill and knowledge in the design and development of electronic circuits to fulfill the needs of small-scale electronic industry.
PO2	Demonstrate, solve and an understanding of major concepts in all disciplines of physics.
PO3	Solve the problem and think methodically, independently and draw a logical conclusion.
PO4	Employ critical thinking and the scientific knowledge to design, carry out,

	record, and analyze the results of Physics experiments.
PO5	Create an awareness of the impact of Physics on the society, and development outside the scientific community.
PO6	To inculcate the scientific temperament in the students and outside the scientific community.
PO7	Use modern techniques, decent equipment's, and Phonics software's
PO8	Become professionally trained in electronics, material science, lasers, and nonlinear circuits.

MSc I Semester (Physics)

Course Title: - (212113), Mathematical Physics. (Paper-I)

Course Outcome: After completion of these course students should be able to.

CO1- Students will understand the concept of vectors and matrices with their properties and applications.

CO2- Students will learn different types of differential equations, Hermit Bessel etc with their properties.

CO3- Students will understand the concept of Fourier and Laplace transform with their properties.

CO4- Students will understand the concept of Greens Function with its properties and application to boundary value problems.

CO5- Students will understand the concept of complex variables, their analyticity and method of contour integration.

Course Title: - (212114), Classical Mechanics. (Paper-II)

Course Outcome: After completion of these course students should be able to:

CO1	The D'Alembert's principle, the Lagrangian and Hamiltonian approaches in classical mechanics.
CO2	The classical background of quantum mechanics and get familiarized with linear

	oscillator, simple and spherical pendulum.
CO3	Solve complicated physical problems using the Poisson's brackets, Hamilton-Jacobi equations, Action, and Angel variables.
CO4	Theory of small oscillations, kinematics, and Dynamics of rigid body in detail.
CO5	Basic idea about symmetric of space and time, concepts of four vectors and scalars.

Course Title: - (212115), Quantum Mechanics-1. (Paper-III)

Course Outcome: After completion of these course students should be able to:

CO1	Difference between classical and quantum mechanical theory and approach.
CO2	Linear Vector Space, operators and tools to calculate eigen values.
CO3	Various techniques to solve time dependent and time independent Schrodinger equations using different coordinate systems.
CO4	Connection between symmetry and conservation laws, commutation relations, tools to calculate components and total angular.
CO5	Various approximation methods utilized in Quantum Mechanics.

Course Title: - (212116), Electronic Devices. (Paper- IV)

Course Outcome: After completion of these course students should be able to:

CO1- Ability to analyze semiconductor devices under various conditions.

CO2- Ability to design and analyze simple electron circuit which is the point of complicated circuits.

CO3- Ability to design and analyze the devices folding the negative resistance properties which leads to great uses.

CO4- Ability to design and analyze the photo optic devices which leads to prepare photo sensors

Course Title :-(212117), Practical Laboratory Course A: General and Optics

Course Outcome: After completion of these course students should be able to:

CO1- Students will understand the working of Constant Deviation Spectrometer (CDS) and its calibration.

CO2- Students will gain practical knowledge of spectrometers and their use in different experiments.

CO3- Students will gain practical knowledge of different Light sources and their power supply used in experiments.

CO4- Students will practically observe different optical phenomena like interference, diffraction, polarization etc.

Course Title :-(212118), Practical Laboratory Course B: Electronics

Course Outcome: After completion of these course students should be able to:

CO1- Basic of parameters and operation of various semiconductor devices.

CO2- Implementation of basic circuits using electronic devices.

MSc II Semester (Physics)

Course Title: - (220349), Quantum Mechanics-II. (Paper-I)

Course Outcome: After completion of these course students should be able to.

CO1	Scattering theory and validity of Born approximations, partial wave analysis
CO2	Importance of relativistic quantum mechanics compared to non relativistic quantum mechanics.
CO3	Various tools to understand field quantization and related concepts.

CO4	Exposure to quantum field theory and universal interaction.

Course Title :- (220350), Statistical Mechanics, (paper-II)

Course Outcome: Students would be able to:

CO1- Students will understand the basic concepts of statistical mechanics, ensembles and the connection between statistics and thermodynamic.

CO2- Students will learn statistics of indistinguishable particles and their applications.

CO3- Students will gain the knowledge of cluster expansion of classical gas, Ising models and phase transition.

CO4- Students will gain the knowledge of Thermodynamic fluctuation, Brownian motion and related identities.

CO5- Students will learn the concept of phase transition of first and second kind. They will also learn adiabatic demagnetization.

Course Title :- (220351), Electrodynamics and Plasma Physics, (paper-III)

Course Outcome: After completing the course students will learn:

CO1	Understanding the electrodynamics and Maxwell's equations in term of scalar and vector potential.
CO2	Students will learn the field of accelerated charge particle and relativistic transformation properties of E and H field in four dimensional spaces.
CO3	Lorentz transformation, Langragian and Hamiltonian for relativistic particle charge particle in EM field.
CO4	Basics of plasma physics, plasma parameters and plasma oscillation.
CO5	Students will be familiar with Magneto-hydrodynamics and hydrodynamic waves.

Course Title :- (220352), Atomic and Molecular Physics-I, (paper-IV)

Course Outcome: After completing the course students will learn:

CO1- Students will have able to describe the atomic spectra of one and two valance electron atoms.
CO2- Students can study the charge in behavior of atoms under applied external electric field.
CO3- Students can explain rotational, vibrational and Raman spectra.
CO4- Students will have the knowledge of different microscopes which leads to observed nano particles.

Course Title: - (220353) Practical Laboratory Course A: General and Optics.

Course Outcome:

CO1- Controlled rectifier Students will learn to verify Hartmann's formula by simple spectrometer.
CO2- Students will gain practical knowledge of finding poisons ratio of glass by optical interference.
CO3- Students will understand the concept of frequency calculation using lissajous figures
CO4- Students will gain practical knowledge of working of silicon.

Course Title: - Practical Laboratory Course B: Electronic, (220354)

Course Outcome

CO1- Verification and analyze of performance of electronic circuits.
CO2- Understanding the forting of electronic devices and components using.

MSc III Semester (Physics)

Course Title: - (320359), Condensed Matter Physics – I (Paper-I)

Course Outcome:

CO1- Student will gain an understanding of crystal structure; diffraction and reciprocal lattice which help in determine the crystal structure of any material.
CO2- Student will learn about the elastic compliance and stiffness constant, elastic waves, elastic energy density, reduction of number of elastic constants.

CO3- Student will be able to realize the important concept of lattice vibrational spectrum, inelastic scattering of photon by phonons. Inelastic scattering of neutrons by phonons..

CO4- Student will understand the basic properties of thermal expansion, thermal conductivity, band theory and Fermi surfaces .derive the expression for anomalous skin effect, Dehass van alphen effect.

CO5- The subject treats functional materials from an experimental viewpoint, solid state theory and properties.

Course Title: - (320360), Nuclear and Particle Physics – I (Paper-II)

Course Outcome: The students will understand ;

CO1- Basic properties of nucleus, its structure and different models that explain the behavior and characteristics.

CO2- Bound state of deuteron by scattering theory.

CO3- Types of nuclear reactions and conservation laws, reaction mechanisms.

CO4- Basic particle physics, conservation laws C, P, T invariance and relativistic kinematics.

Course Title: - (320361), Digital electronics – I (Paper-III)

Course Outcome:

CO1- Students can derive basic logic gates adder and substractor using universal gates, realization of Boolean expression in SOP and POS form and design it using logic gates.

CO2- Design and test combinational circuit.

CO3- Design and develop sequential circuits

Course Title: - (320362), Atomic and Molecular Physics-II (Paper-IV)

Course Outcome:

CO1- Students will understand the concept of Nuclear Magnetic Resonance (NMR) and the interactions responsible for it.

CO2- Students will learn the three types of motion and energies in a molecule. They will also learn Franck Condon principle and Born Oppenheimer approximation.

CO3- Students will understand the concept of Raman Effect, its classical and quantum theory and its application in spectroscopy.

CO4- Students will understand the phenomena of Mossbauer Effect, the concept of recoilless gama emission and their application in spectroscopy.

CO5- Students will understand the concept of Electron Spin Resonance (ESR), the interactions responsible for it and experimental setup for ESR. They will also learn the applications of ESR.

Course Title: - (320363) Practical Laboratory Course A: Solid state Physics.

Course Outcome:

CO1- Enough knowledge and expertise in the general experiments so that they can be fit for teaching job as well as to design the experiments in research purpose.

CO2- To study the basic properties of materials.

CO3- Study the electrical and magnetic behavior of materials by four probe and hall experiment.

Course Title: - (320364) Practical Laboratory Course B: Digital Electronic.

Course Outcome:

CO1- Understand logic Analyzer.

CO2- Understanding the working of Flip-Flop counters etc which are used in computers.

MSc IV Semester (Physics)

Course Title :- (420370) Condensed Matter Physics - II (Paper-I)

Course Outcome:

CO1- Explain various types of magnetic phenomenon, physics behind them, their properties and application .compare between curie weiss law for susceptibility and Heisenberg model and molecular field theory.

CO2- Describes the concept of super conducting state, type I and type II superconductors AC and DC Josephson effects, meissner effect, London equation B.C.S. theory of superconductivity.

CO3- Define and discuss the concepts of nano structured material, structure of single wall carbon nano tubes and electronic, mechanical, thermal and phonon properties on.

CO4- **C04** Student will understand the basic properties of thin film and film thickness, study about electrical conductivity of thin films and quantum size effect in thin film.

CO5- Differentiate between point defects, schottky defect and frenkel defects .Discuss about colour centers, edge and screw dislocation.

Course Title :- (420371) Laser (Paper-II)

Course Outcome: The students will understand

CO1- The student will learn the condition of laser oscillation in different types of optical resonators, their stability, techniques of laser pulse generation, and different kinds of laser systems.

CO2- Study of propagation of light in optical media clarifies the knowledge of students regarding the interference, diffraction,
polarization and other optical phenomena

CO3- The study of non-linear optics analytically and mathematically strong about the subject.

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Course Title :- (420372) Digital electronic –II (Paper-III)

Course Outcome:

CO1- Students will devastate knowledge of analog electrical devices particularly OP-AMP.

CO2- Students will know the fabrication and working principle of OP-AMP amplifiers and oscillator.

CO3- Students also get the knowledge of different languages under which computer runs smoothly.

Course Title :- (420375), Computational Methods and Programming, (Paper-IV)

Course Outcome:

CO1- Students will understand the concepts of Digital computers. They will also learn programming skill in BASIC programming language

CO2- Students will learn different methods of solving Algebraic and Transcendental Equations. They will also learn to solve simultaneous linear equations.

CO3- Students will learn different methods of finding finite difference and interpolation. They will also learn different methods of Numerical Differentiation and Integration.

CO4- Students will learn different methods of solving ordinary and partial differential equations. They will also learn about random variables and methods of importance sampling.

Course Title: - (320377) Practical Laboratory Course A: Solid state.

Course Outcome:

CO1- Correlate their theoretical knowledge with experiments.

CO2- The students will gain practical knowledge in utilizing different types of Interferometers for various uses, practical handling of Lasers and their applications.

Course Title: - (420378) Practical Laboratory Course B: Digital Electronic and communication.

Course Outcome:

CO1- Apply OP-AMPs fundamentals in design and analyze of OP-AMP application.

CO2- Apply OP-AMP fundamentals and computer tools in project design evaluation and analysis.

DEPARTMENT OF CHEMISTRY

BSc I year

Name of the Course: (Paper I Major) Fundamental of Chemistry

Course Outcomes: The students will understand

- Ancient Indian chemical techniques.
- Various theories and principles applied to reveal atomic structure.
- Significance of quantum numbers.
- Concept of periodic properties of elements.
- Theories related to chemical bonding.
- Acid base concept for reactivity of organic molecules.
- Basic and mechanism of chemical kinetics.
- Properties of electrolytes.

Name of the Course: Practical Analysis Qualitative and Quantitative Chemical analysis

Course Outcomes: By the end of this course students will learn the following aspects of laboratory exercises in laboratory

- Importance of chemical safety and lab safety while performing experiments inlaboratory.
- Qualitative inorganic analysis
- Elemental analysis of organic compounds (non-instruments).
- Techniques of pH measurments.
- Preparation of buffer solutions.

Name of the Course: (Paper II Minor)Analytical Chemistry II

Course Outcomes: By the end of this course students will learn the following aspects of chemistry

- Basic concepts of mathematics for chemistry.
- Fundamentals of analytical chemistry and steps involves in analysis.
- Basic concepts of chemical equilibrium.
- Principles of chromatography and chromatographic techniques.
- Various techniques of spectroscopic analysis.

Name of the Course: Practical Analysis (Analytical Process and techniques)

Course Outcomes: By the end of this course students will learn the following aspects of laboratory exercises in laboratory

- Concepts and analyticals methods in chemistry.
- Preparation of solutions of different concentrations.
- Identification of organic compounds by chromatographic techniques.
- Analysis by spectral techniques.

BSc II year (Chemistry)

Name of the Course**: Major chemistry: Reaction, Reagents and Mechanism in organic chemistry (PaperI)**

Course Outcomes: By the end of this course students will learn the knowledge of following aspects of chemistry:

- Various organic reactions, reagents and their mechanisms, which will be helpful in understanding organic synthesis.
- Application of the reaction in the various industries like pharmaceutical, polymer, pesticides, textile, dyes etc.
- Important key reaction used in further study and research work.

Practical Paper: Organic Analysis, reaction and synthesis (paper I)

Course Outcomes: By the end of this course students will learn the knowledge of following aspects of chemistry:

- To perform various reactions, which will be helpful in understanding organic synthesis.
- To use reagent to perform organic reaction
- To perform rearrangement reactions.
- To prepare various organic compounds.
- Application of the reaction in the industries, e.g. pharmaceutical, polymer ,pesticides, textile dyes etc.
- These experiments will also be useful in further study and research work.

BSc II Year

Name of the Course**: Minor chemistry Transition Elements, chemi-energetics, Phase Equillibria (Paper II)**

Course Outcomes: By the end of this course students will learn the knowledge of following aspects of chemistry

- Introductory idea about Transition Indian chemistry
- Chemistryb of d and f block elements, Basic concepts of coordination chemistry.
- Stereochemistry of trantition metal complexes.
- Laws of thermodynamics. concept of phase equilibrium with reference to solid solution.
- Basic concepts of Electrochemistry**.**

Practical Paper: Metal complex preparation, thermo chemistry and phase equilibria experiments (paper II)

Course Outcomes: By the end of this course students will learn the knowledge of following aspects of chemistry

- Preparing inorganic complexes.
- Use of calorimeter for thermochemistry experiments.
- Determination of enthalpy of various systems and reactions.
- Experiments on phase equilibrium.
- Study of reaction equilibrium.

BSc III year (Chemistry)

Name of the Course: Physical chemistry

Course outcomes

Course Outcome (COs): Upon successful completion students should be able to: ϖ Facilitate the learner to make solutions of various molar concentrations. This may include: The concept of the mole; Converting moles to grams; Converting grams to moles; Defining concentration; Dilution of Solutions; Making different molar concentrations.

Course Outcomes: The students will understand

- Elementary Quantum Mechanism: Black body radiation. Plank's radiation law. Photpelectric effect, heat capacity, Bohrs model of de broglyhupothesis, the Heisenbergsuncertainlity, Compton effect.
- Molecular orbital theory
- Spectroscopy, Rotational spectrum, Vibrational spectroscopy.
- Raman spectroscopy
- Electronic spectrum
- Ultravilet spectroscopy
- Photochemistry : Interaction of radiation with matter ,different between thermal and photochemical process .Law of photochemistry
- The relevance of extension of Chemistry in the social context for solving social issues.
  Employability Skills shall enable the students to find jobs in core chemistry and other related fields.
- Entrepreneurial Skills shall empower the students to start their own industries / business in core-chemistry fields.
- Analytical or Experimental Skills make the students capable of doing higherlevel research works in the emerging fields of chemistry.

B.Sc III (Regular)

Name of the Course**: Inorganic chemistry**

Course Outcomes: The students will understand

- Hard and soft acids and bases (HSAB)
  Introduction: classification of hard and soft acid-base, hard and soft acid base concept of pearson.

- Sillicon and phosphazenes
- Metal Ligand Bonding in transition metal complexes.
- Thermodynamics and kinetics aspects of metal complexes.
- Bio -inorganic Chemistry
- Metal nitrosyl complex: Nitrosyl atingagents .synthesis, structure, properties and bonding

B.Sc. III (Regular)

Name of the Course**: Organic chemistry**

Course Outcomes: The students will understand

- Working through this course, students are expected to apply their knowledge to problem-solve, deduce structures, and synthesize simple organic molecules using the studied reactions. Relationships between organic chemistry and other disciplines are noted.
- Specroscopy: Nuclear Magnetic Resonance spectroscopy, Proton Magnetic Resonance
- Organo-metallic compounds
- Organo-Sulphur compounds. Nomenclature ,strcturecharacteristcs
- Organic synthesis by Enolates
- Acidity of hydrogenAmino acid
- Synthesis Dyes: couler and constitution of nucleic acid, ribonucleoside and protein.

- Heterocyclic compounds: Introduction of pyrrol,furan thiophene, and pyridine ;aromatic character and molecular orbital picture

MSc Chemistry

Program Outcomes (PO):

PO1: Creative Thinking: Students will be able to think creatively (divergently and convergent) to propose novel ideas in explaining facts and figures or providing new solution to the problems in chemistry. The skills of observations and drawing logical inferences from the scientific experiments will also be developed.

PO2: Interdisciplinary Approach: Students will realize how developments in any science subject helps in the development of other science subjects and vice-versa and how interdisciplinary approach helps in providing better solutions and new ideas for the sustainable developments. Also the knowledge of subjects in other faculties such as humanities, performing arts, social sciences etc. can have greatly and effectively influence which inspires in evolving new scientific theories and inventions.

PO3: Personality Development: Students will imbibe ethical, moral and social values in personal and social life leading to highly cultured and civilized personality. They will also realize that pursuit of knowledge is a lifelong activity and in combination with untiring efforts and positive attitude and other necessary qualities leads towards a successful life.

PO4 Skills in Research and Industrial Field: Students will build a scientific temper and will be able to learn the necessary skills to succeed in research or industrial field. In addition they will acquire the skills in handling scientific instruments, planning and performing in laboratory experiments.

PO5 Communication Skills: Students will develop various communication skills such as reading, listening, speaking, etc., which we will help in expressing ideas and views clearly and effectively.

PO6 Environmental Monitoring: Students will be able to understand the environmental issues Global warming, Climate change, Acid rain, Ozone depletion and will create awareness in society .

Program Specific Outcomes (PSO):

PSO-1 Students will understand the basic concepts, fundamental principles, and the scientific theories related to various scientific phenomena and their relevancies in the day-to-day life. They will also be able to acquire knowledge about the fundamentals and applications of chemical and scientific theories.

PSO-2 Students will find that every branch of science and technology is related to Chemistry. They will develop scientific outlook not only with respect to science subjects but also in all aspects related to life.

PSO-3 Students will become familiar with the different branches of chemistry like analytical, organic, inorganic, physical, environmental, polymer and biochemistry. They will also learn to apply appropriate techniques for the qualitative and quantitative analysis of chemicals in laboratories and in industries.

PSO-4 The student will acquire knowledge of Chemical Thermodynamics, Kinetics, Electrochemistry, Atomic Structure, Organic Chemistry, Spectroscopy and Skill in Industrial Chemistry.

PSO-5 Viewing chemistry as a tool the developing mind and critical attitude and the faculty of logical reasoning that is prepared to serve in diverse fields.

PSO-6 Students will gain a thorough Knowledge in the subject to be able to work in projects at different research as well as academic institutions.

COURSE OUTCOMES

COURSE TITLE: (PAPER I) INORGANIC CHEMISTRY

CLASS - MSc Chemistry SEMESTER – I

Course Outcomes: The students will understand

- This course aims at acquainting students to concept of Crystal field and Ligand field theory. The symmetry, magnetic properties and spatial arrangements of molecules are studied in good detail.
- Students will be able to analyse the point group of chemical molecules. They will learn the relation of structure to magnetic properties.
- Students will be able to understand the structure and arrangement of ligands around different oxidation state of metals.
- Students will learn the theoretical basis of stability of different electronic states.

- Students will be able to make a correlation between structure and stability of different metal compounds.

COURSE TITLE: (PAPER II) ORGANIC CHEMISTRY
CLASS - MSc CHEMISTRY SEMESTER – I
Course Outcomes:

- This course aims at acquainting students with the knowledge of organic reaction mechanisms of aromatic electrophilic substitution and aromatic nucleophilic substitution reactions.
- It provides an introduction to the synthesis of complex organic molecules.
- Transformations for C-X and C-C bond-formation, functional group reactivity, chemoselectivity, regioselectivity, and the strategy of multistep synthesis will be the core topics that are covered.
- The aim is to help the students to study in detail the basics of very important substitution reactions in organic chemistry. Along with the revision of basic concepts of electrophilic and nucleophilic reactions, further applications in advanced fields of organic chemistry are aimed to be discussed.
- Concepts include strategy/retrosyn thesis, advanced aromatic chemistry, protecting groups, stereochemistry, enolates and other carbonyl chemistry, alkene synthesis, reduction/oxidation (introductory), hetero cycles, cross-coupling reactions and other modern methods of synthesis.

COURSE TITLE: (PAPER III) PHYSICAL CHEMISTRY
CLASS - M.Sc CHEMISTRY SEMESTER – I
Course Outcomes:

- This course aims at to accustom the students the basic concepts of thermodynamics along with the Non-ideal systems including the basic Debye Huckel theory.
- Students will be guided to apply phase rule to various systems (2 and 3 component systems) and introduction to the basic concepts of non equilibrium thermodynamics along with the applications is another purpose.
- Students will explain statistical chemistry and thermodynamics as logical consequences of the postulates of statistical mechanics;
- Apply the principles of statistical mechanics to selected problems;
- Apply techniques from statistical mechanics to a range of situations;
- Use the tools, methodologies, language and conventions of chemistry to test and communicate ideas and explanations.

COURSE TITLE: (PAPER IV) GROUP THEORY AND SPECTROSCOPT I
CLASS - MSc CHEMISTRY SEMESTER – I
Course Outcomes: The students will understand

- To learn modern theoretical and experimental methods used to study problems of molecular structure and bonding; emphasis on spectroscopic techniques.

- To perform rigorous characterization of their compound using 1- and 2-dimensional NMR techniques (1 H and 13C), Mass spectrometry, infrared spectroscopy and UV-Vis spectroscopy.

COURSE TITLE: (PAPER V) MATHEMATICS FOR CHEMISTS

CLASS -M.Sc. CHEMISTRY SEMESTER–I

Course Outcomes:

This course introduces the math content to chemistry study. It has been designed to compliment lecture material with particular focus on the application of math's in chemistry.

- Matrix and its types, determinant and its properties.
- Define the derivative and integral of the trigonometric, logarithmic and inverse trigonometric and rational functions
- Recognize the different techniques of integration (by parts, trigonometric integrals, partial fractions).
- Calculate the rank of matrix
- Determine derivatives of function using different techniques.
- Evaluate integrals by different methods of integration.
- Calculate the areas of plane regions.
- Present mathematics to others in oral and written form clearly and in a well organized manner.

COURSETITLE: PAPER V (b) BIOLOGY FOR CHEMISTS

CLASS -M.Sc CHEMISTRY SEMESTER–I

Course Name : **Course–XIII BIOLOGY FOR CHEMISTS**

Course Outcomes: The students will be able to

- To study the structure and organization of cell membrane and cell wall, process of membrane transport and membrane models.
- To understand the DNA structural organization and biochemical composition of genetic material.
- To understand the vascular tissues, structure of woods and anomalous secondary growth, anatomical variations and tissue systems in plant shoot system.
- To know various tissue systems and understand the normal and anomalous secondary growth in plants
- Knowledge and Understanding**:** Student will know about Whittaker system of classification, plant and animal tissue systems, genetic principles, structure and functional aspects of bio molecules.
- Intellectual Cognitive/Analytical skills**:** Students will be able to understand the

basic principles of biology and bio molecules.

- Transferable skills**:** communicate and interact about the biological principles applied to chemistry.

CLASS - MSc CHEMISTRY SEMESTER – II

COURSE TITLE: PAPER (I) INORGANIC CHEMISTRY

Course Outcomes:

- This course aims at acquainting students to complete knowledge of catalytic and industrial uses of organ metallic compounds.
- Students will be able to understand the role of coordination number, coordination geometry and oxidation state of metal in catalytic cycles.
- Students will be able to study the wide variety of organ metallic compounds and the choice of hapticity in different conditions.
- Students will learn to go through some important emerging compounds especially multi-deckers and wich compounds.
- **Transferable Skills**
  Students will be able to study the reactions at coordinated ligands.

COURSE TITLE: PAPER (II) ORGANIC CHEMISTRY

CLASS - M.Sc CHEMISTRY SEMESTER–II

Course Outcomes:

- This course aims at acquainting students to reaction mechanisms of Inorganic complexions. In organic reaction mechanisms are point of study due to variable coordination number and oxidation states of metalions.
- Students will be able to interpret the different mechanisms of reactions based on rate constant data available.
- Students will be able to predict whether reaction follows outer sphere path or inner sphere path in the reaction mechanisms under study.
- Students will learn to understand the preference of a metalion to under going a particular path way of reaction mechanism.
- Students will be able to judge the relative stability of products in variety of reactions

COURSE TITLE: PAPER (III) PHYSICAL CHEMISTRY

CLASS -M.Sc CHEMISTRY SEMESTER–II

Course Outcomes: The students will understand

- treatment of unimolecular reactions. Dyamic chain (hydrogen bromine reaction, pyrolysis of acetaldehyde, decomposition of ethane).
- photochemical-(hydrogen-bromine and hydrogen-chiurine reactions) and
- homogenous catalysis, kinetics of enzyme reactions, general fbaturesfo fast reactions, study of fast reactions by flow method, relaxation method, flash photolysis ad the nuclear magnetic resonance method, dynamics of unimolecular reactiosn
- Surface tension, capillary action, pressure difference across curved surtace,vapour pressure of droplets (Kelvin equation). (libbs adsorption isolire,estimation of surt'ace area (BET equation), Surf'acefllnts on liquids ([-.lectro-liirrctic phenomenon).
- Micelles Surf.ace active agents, classification of surf-ace active agents. micellization. hydrophobic interaction, critical micellar concentration (CMC). l-actors atlcctingthc CMC of surfactants, counter ion binding to micelles, thermodynamics of micellization-phase separation anc: mass action modeis, solublization. Micro emulsion. reverse micel les.
- 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 Osiltometry, viscometry, diffusion and light scattering nrvthods). sedientation, chain configuration of macromoleoules. of average dimension ol'average determanetion.

COURSETITLE: SPECTROSCOPYAND DIFFRACTION METHODS

CLASS -M.Sc CHEMISTRY SEMESTER–II

Course Outcomes:

- This course aims at acquainting students with techniques that measure the elemental composition at microscopic level,electronicstate,chemicalstateofmatter, bindingenergy, empiricalformulaand moreof surfaceregion of solids

- Students will know how to define the various electronic energy level sinatomsandmolecules, excitations & ejection of electrons, understand and explain the basic conceptsassociated with Symmetry & molecular orbitals, Dissociation, Predissociation, change ofshapeonexcitation

COURSETITLE: COMPUTER FOR CHEMISTS–THEORY

CLASS - MSc CHEMISTRY SEMESTER –II

Course Outcomes:

- This course aims satac quainting students with learn various concept sand basic technique sessential for conduct of practical in computers.
- Basic understanding about Computer.
- Understanding the basic concept associated with C- Language and program designing Students will develop different programs, Run and Retrieve results.

- Intellectual(Cognitive/Analytical)skills:
- Design program in C-language on the basis of given query.
- Use of standard input (scanf) and standard output (printf) functions
- Use of variables, key words, arithmetic operators, relational operators, logical operators, unary operators, assignment operator, arithmetic assignment operators and conditional operator.
- Use of library functions and user defined functions.
- Use of Looping Statement (like while, do-while, for loops) and branching statements (like if, if-then, if-then-else).
- Create functions and to show different calls: Call by reference, Call by value.
- In future student may be able to develop a big program(s) (Software) which may simulate the behavior of the chemical reaction/processes/events

CLASS -M.Sc CHEMISTRY SEMESTER–III

COURSE TITLE: (PAPER I) APPLICATION OF SPECTROSCOPY I

Course Outcomes:

- This course aims at acquainting students to concept of synthesis in organic chemistry.
- This illcovera wide area of synthesis including poly nuclear compounds, heterocyclic compounds, reagents in organic synthesis, and basic concepts of supra molecular chemistry.
- Students will be able to analyse the difference in the basic types of synthetic approaches.
- Students will be able to understand the role of reagents and catalysts in organic synthesis.
- Students will be able to make a correlation between supra molecular and normal organic synthesis.

COURSE TITLE: (PAPER II) PHOTO CHEMISTRY

CLASS -M.Sc CHEMISTRY SEMESTER–III

Course Outcomes:

- This course aims at acquainting the students the knowledge of the basic concepts of polymers. A complete packet of knowledge of the kinetics, thermo dynamics of polymerization, various techniques of determination of molecular mass and applications of polymers in various fields of life will be provided to the students.
- Various factors affecting the structure and properties of polymers will be discussed in detail which makes students aware of the things to be considered while preparing polymers commercially.
- This course will equip the students with the necessary detailed chemical knowledge concerning the chemistry of macromolecules.
- This will also help to develop skills to interpret and explain various factors affecting structure and property of macromolecules. The students will be able to pursue their career objectives in higher education, scientific research and teaching.

COURSE TITLE: (PAPER III) ENVIRONMENTAL CHEMISTRY
CLASS -M.Sc CHEMISTRY SEMESTER–III

Course Outcomes:

- This course aims at acquainting students with the knowledge of various concepts and theories related to physical chemistry. The present syllabus has been framed as per the latest UGC guidelines and recent research trends in the subject.
- To equip students with necessary chemical knowledge concerning the concept of reaction rates and electro analytical techniques and to bring forth the importance of academic and laboratory skill for the students.
- Students will understand the fundamentals of Chemical dynamics and Voltammetry and their applications.
- Students will be able to develop the academic and laboratory skills.
- Studentswillbeabletoexplorenewareasofresearchinbothchemistryandalliedfieldsofsci enceand technology.
- Students will be skilled in problem solving, critical thinking and analytical reasoning as applied to scientific problems.

COURSETITLE:(PAPER IV) PHYSICO ORGANIC CHEMISTRY
CLASS -M.Sc CHEMISTRY SEMESTER–III

Course Outcomes:

- Advanced techniques in PMO and FMO theory" Molecular mechanism semi ernpirical methods and abinitio and density functional "ntethods.
- Scope and limitations of several computational programmes.
- Quantitative MO theory :lluckelnrolecular orbital (flMO - rnethotl as alrplic-d to ethene" allyl and butadiene. Qualitative MO theory' ionisation potential. lrlectron
- MO energy levels. Orbital symmetry. Orbital interaction diagrams.
- MO of simple organic systems such as ethene, allyl. butadiene. ntethane and niethvl group.
- Conjugation and hyper-conjugation.
- This course aims at acquainting students to the knowledge of transition metal compounds with bonds to hydrogen. Such compounds have wide synthetic applications from study point of view**.**
- Students will be able to characterize the erotically the type of bond of hydrogen with the transition metal.
- Students will be able to understand there dicing properties of compounds and the chemical reactions.
- Students will learn to make difference of terminal and bridging hydrogen bonds.
- Students will be able to think and devise new synthetic applications of such compounds.

COURSE TITLE:(PAPER I) APPLICATION OF SPECTROSCOPY II
CLASS -M.Sc CHEMISTRY SEMESTER–IV

Course Outcomes: The students will understand

- Visible spectroscopy Various electronic transitions
- Beer-Lambert law, Effect of solvent on electronic transitions, ultraviolet bands
- for carbonyl compounds, unsaturated carbonyl compounds, dienes, coniugated
- polyenes, Fieser Woodward rules for conjugated dienes and carbonyl
- compounds, ultraviolet spectra of aromatic compounds. Steric effect in
- biphenyls.
- Infrared Spectroscopy characteristic vi brationallrequencies of al kanes.
- alkenes, alkynes, aromatic compounds, alcohols,,ethers. phenols and amines.
- Detailed study of vibrational frequencies of carbonyl 'compounds (ketones.
- aldehydes, esters, amides, acids, anhydrides, lactones. lactams and conjugated
- carbonyl compounds). Effect of hydrogen bonding and solvent eff-ect on

COURSENAME:(PAPER II) SOLID STATE CHEMISTRY

CLASS -MSc CHEMISTRY SEMESTER–IV

Course Outcomes:

- This course aims at acquainting the students the knowledge of the factors affecting glassformationvariousthermodynamic, kinetic factors controlling the designing of glass materials, important compositions and different properties.
- A complete packet of knowledge of the preparation of smart materials and their applications as nano drug deliveryagentsand energystoragematerials.

The aim is to help the students to understand the basics of glass formation from differentmaterials along with different kinetic and thermodynamic aspects discussing the applicationsalso. Smart materials will be introduced while discussing different electrical and magneticproperties

- General principles, experimental procedure, co-precipitation
- solid state reactions, kinetics of solid state reactions.
- Perfect and imperfect crystals, intrinsic
- Thermodynamics of Schottky and Frenkel defect for mation, colour.
- Non-stoichio metryanci defects.
- Metals insulators and semiconductors, electronic structure of solids band
- Band structure of metals, insulators and semiconductors. Intrinsic and extrinsic*
- Semi conductors, doping semiconductors, p-n junctions, super condr.

COURSE NAME: (PAPER III) BIO CHEMISTRY

CLASS -M.Sc CHEMISTRY SEMESTER–IV

Course Outcomes:

- Recognize and draw particular carbohydrate structures
- Know general structuralle ments of cyclic monosaccharide’s and disaccharides, and

the irimplications for structure/function

- Predict the products of condensation reactions and hydrolysis.
- Knowledge of Sequence determination of amino acids
- Familiarity with Enzymes, Kinetics, inhibition mechanism.
- Know general structure of Nucleosides, nucleotides, DNA, RNA structure etc.
- Students will able to Recognize and draw particular carbohydrate structures, general of cyclic monosaccharide's and disaccharides, and the irimplications for structure/function.
- Students will able to predict the products of condensation reactions and hydrolysis.
- Students will capable of determining the Sequence of amino acids
- Students will be Familiar with Enzymes, Kinetics, inhibition mechanism and structure of Nucleosides, nucleotides, DNA, RNAstructureetc.

COURSE NAME: (PAPER V) ANALYTICAL CHEMISTRY

CLASS -M.Sc CHEMISTRY SEMESTER–IV

Course Outcomes: The students will understand

- Analytical chemistry Classification of analytical methods classical and Types of instrumental analysis. Selecting an analytical method. Neactness weighing, errors. Volumetric glassware cleaning and calibration of glassware.
- Sample Volumetric glassware cleaning and Calibration of glassware. Sample preparation is solution and decompositions. Gravimetric techniques. Selecting and handling or reagents. Laboratory notebooks. Safety in the analytical laboratory.
- Errors and Evaluation

COURSE NAME: (PAPER IV b) MEDICINAL CHEMISTRY

CLASS -M.Sc CHEMISTRY SEMESTER–IV

Course Outcomes: The students will understand

- Biological activity (SAR). Receptor Site Theory. Approaches of drug design.
- Introduction to combinatorial synthesis in drrrg discovery.
- Factors aftectingbioactivity. QSAR-Free-Wi lson analysis, Hansch analysis,
- Relationship between Free-Wilson analvsis and Hansclranalvsis.
- Pharmacodynam: Introduction, elementary treatment of enzymes stimulation, enzyme inhibition, sulfonamides, membrane active drugs. drug metabolism, xenobiotics, biotransformation, significance of drug metabolismin medicinal chemistry.
- Antibiotics and antibacterials
- Introduction, Antibiotic S -Lactam type - Penici I Ii ns, Cephalosporins

DEPARTMENT OF MICROBIOLOGY

Program Learning Outcomes

- Students of B Sc Microbiology programme will learn to use scientific logic as they explore a wide range of contemporary subjects spanning various aspects of basic microbiology such as Bacteriology, Virology, Biochemistry, Microbial Physiology, Immunology, Cell Biology, Molecular Biology, Genetics, Systems Biology, Immunology and Molecular biology, in addition to becoming aware of the applied aspects of microbiology such as Industrial Microbiology, Food and Dairy Microbiology, Environmental Microbiology and Medical Microbiology to name just a few.

- Students will appreciate the biological diversity of microbial forms and be able to describe/explain the processes used by microorganisms for their replication, survival, and interaction with their environment, hosts, and host populations. They will become aware of the important role microorganisms play in maintenance of a clean and healthy environment. They will learn of the role of microorganisms in plant, animal and human health and disease.

- Students will gain knowledge of various biotechnological applications of microorganisms and will learn of industrially important substances produced by microorganisms. They will gain familiarity with the unique role of microbes in genetic modification technologies.

- Students will become familiar with scientific methodology, hypothesis generation and testing, design and execution of experiments. Students will develop the ability to think critically and to read and analyze scientific literature.

- Students will acquire and demonstrate proficiency in good laboratory practices in a microbiological laboratory and be able to explain the theoretical basis and practical skills of the tools/technologies commonly used to study this field.

- Students will develop proficiency in the quantitative skills necessary to analyze biological problems (e.g., arithmetic, algebra, and statistical methods as applied to biology)

- Students will develop strong oral and written communication skills through the effective 2 presentation of experimental results as well as through seminars.

- Graduates of the B.Sc. Microbiology programme will be informed citizens who can understand and evaluate the impact of new research discoveries in the life sciences, and will be able to pursue a wide range of careers, including biological and medical research in higher education institutions as well as careers in public and global health, scientific writing, environmental organizations, and food, pharmaceuticals and

biotechnology industries.

BSc I Year Microbiology

Paper-I (Major) General Microbiology and Cell Biology

CO1- To understand the basics of microbiology.
CO2- To understand the different type of microorganisms.
CO3- To describe the symbiosis of microorganisms and microbial disease.
CO4- Understand the structure, function and metabolism of microbes.
CO5- Understand the application of microbes in ecological and economic processes.

Paper-II(Minor) Tools &Techniques in Microbiology

CO1- Understand the fundamentals of Instrumentation.
CO2- Basic Media preparation.
CO3- Understand the fundamentals of biostatistics.
CO4- Analyze the measures of central tendencie
CO5- Analyze the various methods of distribution.
CO6- Analyze the various types of statistical tests.
CO7- Analyze correlation, regression of biostatistics.

B.Sc II Year Microbiology

Paper-I (Major)Biochemistry & Microbial Physiology

CO1- Describe the role of macromolecules.
CO2- Understand about the structure and function of hormones
CO3- Describe the metabolism of macromolecules.

Learning outcome: This particular paper will help in understanding the basic biochemistry involved in the course including buffers, carbohydrate, lipid, proteins, enzymes.

Course level learning outcomes: Students will gain knowledge of energy transfers and biomolecular transformations.Students will comprehend metabolic pathways unique to microorganisms.

Learning outcome: Its an advanced course where students get to know about the microbes in extreme environment, their mode of functioning under stress. Besides this, they are acquainted with prokaryotic photosynthetic machinery in detail and the knowledge gained can be applied for enhancing the efficiency of plants.

Paper-II (Minor) Microbial Genetics & Molecular Biology

Objectives: This course develops concepts in molecular biology: DNA packaging, DNA damage and repair, gene structure, expression and regulation in both prokaryotes and eukaryotes.

Course content: Nucleic Acids, bonds, types of DNAs, DNA packaging and model organisms. DNA Damage, DNA Repair and Recombination 3. How cells read the Genome

Learning outcome: This paper acquaints the student with the genetic material in prokaryotes, mutations which are of importance for applying the knowledge in research.

Course level learning outcomes: Understanding of gene structure, expression and regulation of gene expression in both prokaryotes and eukaryotes for application in molecular research.

B.Sc III YEAR Microbiology

Paper-II Applied & Environmental Microbiology

Objectives: This course develops concepts in Environmental Microbiology (microbial diversity, community structure and role of microorganisms in biogeochemicl cycles, role of microorganisms in sustainable development and bioremediation of pollutants using microorganisms.)

Course contents

1. Microbial Ecology
2. Biogeochemical processes
3. Concepts of sustainable and holistic development
4. Microbes on surface
5. Microbiological bioremediation

Course Level Learning Outcomes:

- Students will gain knowledge and use the properties of microorganisms, principally bacteria, as bioindicators of contamination and to remedy problems of contamination and other environmental impacts.
- Student will understand the significance of microorganisms in biogeochemical cycling of nutrients, sustainable development and bioremediation of pollutants for developing strategies of environmental conservation and remediation.

Learning outcome: This is a specific paper which will train students for sustainable development by maintaining soil health. Besides this, they will be acquainted with the biofertilizer production technology and the bottlenecks in the technology.

Paper-II -Immunology and Medical Microbiology

Objectives: It is to develop concepts in role and the underlying mechanisms for the

functioning of immunological cells and their interactions. The regulation of molecular synthesis, signalling, immune responses and allied activities of immune system at the molecular level.

Course contents

1. Phagocytosis
2. Immunocompetent T and B cells
3. Immuno-technique

Course level learning outcomes:

- Explain the mechanisms of immunological responses. Apply the principles of cellular ontogeny and the gene rearrangement to understand the novel and complex immune system.
- Students will study the detailed structure of nucleic acids.
- Students will learn in detail the molecular processes such as replication, transcription and translation.
- Students will gain knowledge of prokaryotic gene transfer mechanisms, mutations and recombination.

MSc Microbiology

Department of Microbiology

(Programme Outcomes POs): MSc Microbiology

- Students will be able to think critically about microbiology and microbes.
- They will learn about history, general features and characteristics of microbes and bio- safety issues.
- They will learn various techniques for detection, identification and characterization of microbes.
- Learn about applied application of microbes.
- Generate knowledge about molecular approaches of Recombinant DNA technology for betterment of society.

Programme Specific Outcomes (PSOs)

MSc Microbiology, I Semester:

- Understand history of microbiology and microorganisms
- Learn about general Techniques to isolate the microbes.
- Understand general feature and characteristics of microbes
- Understand the Biochemistry of microbes.
- Understand the microbial genetics of microbes
- Understand gene mutation and gene transfer.
- Learn about gene expression in Prokaryotes and Eukaryotes.
- Understand and learn about general techniques to detection and identitfication of microbes.

- Learn various methods to investigate significant data through statistical methods.
- Learn about basics of computer.

M. Sc. Microbiology, II Semester:

- Understand core techniques and essential enzyme used in recombinant DNA Technology (rDNA Technology).
- Learn about application of r-DNA Technology
- Understand and learn cloning strategies.
- Learn about DNA sequencing methods.
- Understand basic aspects of Bioenergetics and metabolism of microbes.
- Learn about assimilation of nitrogen by microbes.
- Lean Microbes used in food Microbiology
- Microbial spoilage of food, food preservation and microbial indicators of food safety and quality.
- Understand to industrially important strain of microbes.
- Learn about novel microbes and methods of strain improvement in industry.
- Lean about Industrial production of enzymes, alcohol, acids, Vaccines and vitamins through the helps of microbes.

M. Sc. Microbiology, III Semester:

- Understand Immunology and immunodiagnostics
- Learn about infection, Antigen, Antibody, MHC and Immune response.
- Understand transplantation immunology, Tumour immunology and Immuno deficiency diseases.
- Understand environmental microbiology and microorganism in air and their common diseases Learn about microbial assessment of water quality test
- Microorganisms of sewage and its treatment
- Learn about Microbial degradation, Xenobiotics, Phytoremediation and Bioremediation.
- Understand agriculture microbiology
- Lean about Rhizosphere and phyllosphere microflora
- Understand plant diseases caused by microbe
- Understand physical and chemical method to control plant diseases.
- Learn about biofertilizers and its applications
- Understand about medically important microorganism and normal microflora of human and animal system.
- Learn about infection/disease and their pathogens.
- Understand Pathogenesis, immunity and laboratory diagnosis of various diseases caused by medically important microbes.

MSc Microbiology, IV Semester:

Program Specific Outcomes (PSOs):

Students engaged in project /dissertation work for six months in the department of Microbiology J.H.Govt. P.G. College Betul or other scientific institutes of India.

For this tenure student will be able to understand various aspects of basic and applied research and do research work in future for betterment of society.

Course Outcomes (COs)

- Understand and learn about history and classification of microbes.
- Learn about general features and characteristics of microorganisms.
- Understand and learn about technique used to identify microbes in microbiology field.
- Learn various methods to investigate significant data through statistical methods and Learn about basics of computer.
- Knowledge generate about Biochemistry of microbes.
- Knowledge generate about genome and their structures.
- Learn about gene and gene mutation.
- Knowledge generated about gene expression
- Generate knowledge about cloning strategies.
- Understand DNA sequencing methods
- Understand food and Industrial microbiology.
- Understand and learn food preservation and spoilage.
- Generated knowledge about microbial indicators for food safety and quality
- Knowledge generated about Immunology and Immunodiagnostics.
- Learn about Environmental Microbiology
- Learn about Microbial degradation, Xenobiotics, Phytoremediation and Bioremediation.
- Generated knowledge about plant pathogenic disease (Microbial Biodiversity) its management strategies and biosafety issues.
- Learn about Bio-fertilizers and its applications.
- Learn about medically important microbes, their diseases, pathogenesis, Immunity and Laboratory diagnosis.

DEPARTMENT OF BIOTECHNOLOGY

B Sc I Year

Course Code –CORE TH-1-SI-BTE C1 T, Paper Name – Cell Biology And Biochemistry

Course Learning Outcomes :-

1. Understanding the basic of cell biology.
2. Appreciate the importance of bonding and special arrangements of molecules for proper functioning and stability.
3. Understand both the physical as well as chemical properties of biomolecules.
4. The student could pursue a career in biochemical testing.The decrease of increase in the amount of some of the biomolecules can have clinically significance.
5. Students can also go in for medical laboratory technique courses, opening opportunities in hospital and pathological laborartories.

Course Code –CORE TH-2-SI-BTE C2 T, Paper Name – Microbiology and Immunology

Course Learning Outcomes :-

1. Microbial diversity and nutrition.
2. Immune system , it's properties and types.
3. Immunoglobulin structure, type and function and can apply the concept of hypersensitivity and vaccination of different diseases.
4. Perform various immunological techniques.

B.Sc II Year

Course Code - S2-BTEC1T ,Paper Name - Basic Molecular Biology

Course Learning Outcomes :-

1. Students will be able to explain role of different protein/ enzymes involved in cell signalling.
2. They will be able to understand mechanism of genetic damage caused by mutation and role of various repair system in neglecting the effect of these mutation.
3. Students will be able to explain mechanism of DNA replication, transcription, translation and other related processes

Course Code S2-BTE C2 T - , Paper Name - Recombinant DNA Technology

Course Learning Outcomes:-

1. The objectives of this course are to teach students with various approaches to conduct genetic engineering and their applications in biological research as well as in biotechnology industries.
2. Genetic engineering is a technology that has been developed based on our fundamental understanding of the principles of molecular biology and this is reflected in the contents of this course.
3. Given the impact of genetic engineering in modern society, the students should be endowed with strong theoretical knowledge of this technology.
4. In conjunction with the practicals in molecular biology and genetic engineering, the students should be able to take up biological research as well as placement in the relevant biotech industry

B.Sc III Year

Paper Name (Paper I) - Molecular Biology and Genetic Engineering

Course Learning Outcomes:-

1. To provide comprehensive background of Salient features of Nucleic Acids and DNA model to the course learners.
2. To impart detailed understanding of key events of molecular biology comprising of mechanism of DNA Replication, Transcription and Translation in Prokaryotes and Eukaryotes.
3. To provide adequate knowledge about Post Transcriptional Modifications and Processing of Eukaryotic RNA to the course learners.
4. To give detailed explanation of Transcriptional Regulation with examples of lac operon and tryptophan operon in prokaryotic as well as eukaryotic organisms along with key concept of Gene Silencing to the course learners.
5. To develop comprehensive understanding regarding DNA Repair Mechanisms in the course learners.
6. To provide glimpse of types of Regulatory RNAs by imparting adequate information about Ribo-switches, RNA Interference, miRNA and siRNA to the course learners.
7. To acquaint students with various approaches of recombinant DNA technology and their applications in biological research as well as in biotechnology industries.
8. Endowed with strong theoretical knowledge of recombinant DNA technology and its applications in the genetic manipulation of organism for the industrial, agriculture and pharmaceutical industries.
9. In conjunction with the practicals in molecular biology & genetic engineering, the students should be able to take up biological research as well as placement in the relevant biotech industry.

Paper Name (Paper II) – Applied Biotechnology

Course Learning Outcomes:-

1. Give an overview of the different research areas in biotechnology
2. Explain the basic principles of main biotechnological tools and processes
3. Explain the challenges associated with the development of new biotechnological processes
4. Describe a number of biotechnological processes in the Food and Pharma industry
5. Explain the importance of biotechnology for a more sustainable future

M.Sc I Semester

Paper Name (Paper I) – Cell Biology

Course Outcomes:-

1. Students will understand and describe the structure and basic components of prokaryotic and eukaryotic cells.
2. Students will understand how these cellular components are used for various cellular activities.
3. Students describe the cyclical events of cell division and type of cell divisions.
4. Acquaint the knowledge of cell biology of understanding various physiological processes.
5. Understanding the Cancer biology, process of cell death and cellular ageing.

Paper Name (Paper II) – Biomolecules : structure ,function and metabolism

Course Outcomes:-

1 - Comprehend the structure and functional complexity of macromolecules (carbohydrate, protein, lipid, nucleic acid).
2 - Comprehend the mechanistic nature of metabolic pathway.
3 - Evaluate the basic chemistry and underline the structural properties of different macro molecules
4 – Evaluate how disruption in macromolecules function and metabolism can lead to human disease.
5 – Analysis enzyme performance using basic mathematical models of reaction kinetics.

Paper Name(Paper III) – Instrumentation Analytical Techniques

Course Outcomes:-

1: Discuss the applications of biophysics and principle involved in bioinstruments
2: Describe the methodology involved in biotechniques.
3: Describe the applications of bioinstruments.

4: Demonstrate knowledge and practical skills of using instruments in biology and medical field
5: Perform techniques involved in molecular biology and diagnosis of diseases
6: Update current knowledge regarding biomedical engineering involving new methods and the instrumentation
7. Describe the application and methodology involved in different types of chromatographic techniques.
8. Explain the principle involved in electrophoresis.

Paper Name (Paper IV) – General and Applied Microbiology

Course Outcomes:-

1.Understand the basic microbial structure and functions of various physiological groups of prokaryotes and eukaryotes and also learn the theory and practical skills in microscopy handling and staining techniques.
2.Know various Culture media and their applications and understand various physical and chemical means of sterilization and also learn various techniques for isolation of pure cultures.
3.Comprehend the various methods for identification of unknown microorganisms and study microbial metabolism – Autotrophy and heterotrophy modes of nutrition.
4.Understand the microbial physiology and know the various Physical and Chemical growth requirements of bacteria and get equipped with various methods of bacterial growth measurement.
5.Ability to categorize the metabolic pathways in microorganisms and understand their roles in central metabolism and analyze the growth kinetics employed in industrial fermentation processes and employ in strain improvement.

M.Sc II Semester

Paper Name(Paper I) – General and Applied Microbiology

Course Outcomes:-

1.To provide comprehensive background of Salient features of Nucleic Acids and DNA model to the course learners.

2.To impart detailed understanding of key events of molecular biology comprising of mechanism of DNA Replication, Transcription and Translation in Prokaryotes and Eukaryotes.

3.To provide adequate knowledge about Post Transcriptional Modifications and Processing of Eukaryotic RNA to the course learners.

4.To give detailed explanation of Transcriptional Regulation with examples of lac operon and tryptophan operon in prokaryotic as well as eukaryotic organisms along with key concept of Gene Silencing to the course learners.

5.To develop comprehensive understanding regarding DNA Repair Mechanisms in the course learners.

6.To provide glimpse of types of Regulatory RNAs by imparting adequate information about Ribo-switches, RNA Interference, miRNA and siRNA to the course learners.

Paper Name(Paper II) – Macromolecules and basic enzymology

Course Outcomes:-

1.Describe and use the equations of enzyme kinetics.

2.Describe the methods used in enzyme kinetics.

3.Describe the principles of enzyme inhibition.

4.Describe the mechanisms of enzyme catalysis.

5.Describe the catalytic mechanisms employed by the most well-characterized enzymes.

6.Describe the mechanisms of enzyme regulation.

Paper Name (Paper III) – Biostatistics, computer application and basics of bioinformatics.

Course Outcomes:-

1.Understand and interpret commonly reported statistical measures published in healthcare research.
2.Analyze the different type of data using appropriate statistical software.

3.Demonstrate a good understanding of descriptive statistics and graphical tools.

4.Familiar with parts of computer

5.Understand the input and output devices.

6.Basic ideas of storage devices, computer Networks and Operating System

7. knowledge and awareness of the basic principles and concepts of biology, computer science and mathematics

8.existing software effectively to extract information from large databases and to use this information in computer modeling

9.problem-solving skills, including the ability to develop new algorithms and analysis methods

10.an understanding of the intersection of life and information sciences, the core of shared concepts, language and skills the ability to speak the language of structure-function relationships, information theory, gene expression, and database queries

Paper Name(Paper IV) – Bioprocess Engineering and Technology

Course Outcomes:-

1.The fundamental concepts of bioprocessing

2.Understand the difference between bioprocesses and chemical processes

3.Bioprocess design and operation

4.Ability to select the bioreactor

5.To introduce the engineering principles of bioprocesses including characteristics of different microbial cells, enzymes, microbial kinetics, and design considerations.

6.Get familiar with various standards and calibration methods used in Instrumentation and Instrumental Analysis.

7.Get knowledge of basic principles behind the working of different analytical instruments and its application in industries.

8.Use suitable measurement technique for process industries.

9.Control system for monitoring of various parameters in bioprocess industries and to maintain safety.

M.Sc III Semester

Paper Name (Paper I) – Genetic Engineering

Course Outcomes:-

1.To acquaint students with various approaches of recombinant DNA technology and their applications in biological research as well as in biotechnology industries.

2.Endowed with strong theoretical knowledge of recombinant DNA technology and its applications in the genetic manipulation of organism for the industrial, agriculture and pharmaceutical industries.

3.In conjunction with the practicals in molecular biology & genetic engineering, the students should be able to take up biological research as well as placement in the relevant biotech industry.

Paper Name (Paper II) – Plant Biotechnology

Course Outcomes:-

1. Students gain an insight on the approaches for plant propagation further understanding the importance of plant diversity.

2. Gain hands on experience on the widely exploited techniques in biotechnology to perform basic and applied research further building a collaboration to tackle the challenges encountered in the sphere.

3. Understand the importance of GM plants and their role as bioreactors in the synthesis of products having industrial and economic value.

Paper Name(Paper III) – Immunology and Animal Biotechnology

Course Outcomes:-

1: To remember how immune response is generated in humans to foreign antigens and B and T cell involved responses.

2: To apply the adverse effect of immune system including allergy, hypersensitivity and autoimmunity

3: To understand the Molecular Techniques used in Gene manipulation.

4: To evaluate the principles of recombinant DNA technology in medical sciences and industry

Paper Name (Paper IV) – Environmental Biotechnology

Course Outcomes:-

1: They would understand and analyze environmental relationships with a better assessment of the mechanisms of environmental components like atmosphere, hydrosphere and lithosphere.

2: Students will become skilled at basic theoretical concepts highlighting in the field of ecology, and how these are applied to different ecological approaches.

3: The studies of ecology, biogeography and ecosystem structure will provide the awareness on ecological and historical foundations for understanding the distribution and abundance of species and the changes in their distribution and abundance over time and climatic impact.

4: Student understood the concept of environmental pollution, types of pollutants and related hazards. Acquire knowledge of bioremediation and its applications in environmental clean-up and various waste and disaster management methods and policies.

5: Build awareness about environment conservation, environment protection acts. Studies on current global environmental issues will make aware to students about their causes and effect measure should be consider.

M.Sc IV Semester

Paper Name (Paper I) – Advance Molecular Biology

Course Outcomes:-

1.Concept of gene, pseudogene, cryptic gene and split gene

2. DNA replication and regulation in prokaryotes and eukaryotes

3. Transcription in prokaryotes and eukaryotes

4. Translation in prokaryotes and eukaryotes

5. Post translation and transcriptional mechanism

6. Gene expression in prokaryotes using Lap operon and in Eukaryotes by Trp operon.

Paper Name (Paper II) – Applied Biotechnology

Course Outcomes:-

1.Give an overview of the different research areas in biotechnology

2.Explain the basic principles of main biotechnological tools and processes

3.Explain the challenges associated with the development of new biotechnological processes

4.Describe a number of biotechnological processes in the Food and Pharma industry

5.Explain the importance of biotechnology for a more sustainable future

Paper Name (Paper III) – Biology of Immnune System

Course Outcomes:-

1.to provide an adequate knowledge about the function of the immune system;

2.to analyze the mechanisms at the base of the immune response against the different infectious agents and against tumors;

3.to provide an overall comprehension about the causes and the pathogenesis of the main alterations of the immune response;

4. to provide an adequate knowledge about vaccines and immunotherapy.

5. to gain a deep knowledge about the features and mechanisms of innate and adaptive immune response.

6.to describes the mechanisms involved in acute and chronic inflammation;

7.to apply the acquired knowledge on the immune response to explain defense mechanisms against infectious agents and tumors;

8.to apply the acquired knowledge on the immune response to explain the mechanisms involved in immune system alterations and to comprehend the function of vaccines and immunotherapy;

9.to acquire a correct terminology for the proper presentation of the processes examined.

Paper Name (Paper IV) – Dissertation

Course Outcomes

1: Learn how to collect, read and manage research information

2: Plan experiments, conduct and observe results

3: Write and publish results effectively

बी.ए.(हिन्दी)
कला स्नातक (बीए) का कार्यक्रम परिणाम

बीए में प्रवेश के इच्छुक छात्र कला स्नातक बी.ए.(हिन्दी) कार्यक्रम में निम्नलिखित गुणवत्ता ग्रहण करेगें उम्मीद है कि यह प्रोग्राम विद्यार्थियों को अपेक्षित लक्ष्यों को प्राप्त करने के साथ ही उनके भविष्य को उज्जवल बनाने में और अभिव्यक्ति कौशल विकसित करने में उनकी मदद करेंगा। उनके चरित्र में मानवीय गुणों का विकास करने की दृष्टि से भी यह प्रोग्राम महत्वपूर्ण है।

पाठ्यक्रम अधिगमः-

PO1- मानवीय मूल्यों का बोध।
PO2- समाज सेवा की भावना।
PO3- जिम्मेदार और कर्तव्यपरायण नागरिक के गुणों का विकास।
PO4- गंभीर स्वभाव एवं जीवन की विषमताओं से लड़ने की क्षमता।
PO5- रचनात्मक क्षमता

बी.ए.(हिन्दी) प्रथम वर्ष

कार्यक्रम विशिष्ट परिणाम बी.ए.(हिन्दी)

बीए (हिंदी) पाठ्यक्रम पूरा करने पर छात्र, सक्षम हैं:-

PSO1- हिंदी की मूल अवधारणा और विषय और इसकी उत्पत्ति को समझने के लिए

PSO2- विषय हिंदी और उसकी शाखाओं को महत्व देना।

PSO3- हिंदी साहित्य के विभिन्न पहलुओं को समझने की विधि और देने की प्रक्रिया के साथ नई विधा और दिशा का बोध।

PSO4- विभिन्न क्षेत्रों और सिद्धांतो के अनुरूप शब्दावली और इसके विपरीत में प्रयास करने के लिए सक्षम।

PSO5- हिंदी साहित्य की इसकी दार्शनिक विधियों का विस्तार और समझ।

PSO6- अतीत से वर्तमान तक हिंदी की अवधारणा का मूल्यांकन करना और साहित्य के माध्यम से समाज को और अधिक निकटता से जानना।

बी.ए.(हिन्दी) द्वितीय वर्ष

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बी.ए.(हिन्दी) तृतीय वर्ष

पाठ्यक्रम का नाम: प्रथम प्रश्न पत्र- प्रयोजन मूलक हिंन्दी ।

पाठ्यक्रम परिणाम:

CO1- हिंन्दी के प्रयोजन मूल्क या कामकाजी स्वरूप का परिचय।

CO2- कार्यालयों में प्रयु हिन्दी के स्वरूप की जानकारी।

CO3- अनुवाद एवं पत्रकारिता के अध्ययन द्वारा रोजगारोन्मुखी दृष्टिकोण का विकास।

CO4- कम्पयूटर के क्षेत्र में हिन्दी के विकास की जानकारी।

पाठ्यक्रम का नाम द्वितीय प्रश्न पत्र- नाटक निबंध तथा स्फुट गद्य विधाये एवं बुन्देली भाषा।

पाठ्यक्रम परिणाम

CO1- हिन्दी गद्य की विभिन्न विधाओं के सम्पन्न साहित्य का परिचय।

CO2- साहित्य के माध्यम से राष्टीय चेतन का विकास।

CO3- बुंदेली भाषा का क्रमिक विकास उसकी उपल्बधियां एवं व्यापक क्षेत्र का परिचय।

CO4- हिन्दी निबंध के विविध स्वरूपों की जानकारी।

स्नातक प्रथम वर्ष आधार पाठ्क्रम (हिन्दी)

(बी.ए./बी.कॉम कम्प्युटर /बी.कॉम टेक्स/बी.एस.सी/बीबीए/बीसीए)

पाठ्यक्रम का नाम : प्रथम प्रश्न पत्र- हिन्दी भाषा और नैतिक मूल्य

पाठ्यक्रम परिणाम :

CO1- हिन्दी भाषा एवं नैतिक मूल्य से जुड़ी इकाइयों का समावेश किया गया है।

CO2- नैतिक मूल्य का सामाजिक, राजनैतिक, शैक्षणिकता में बहुत अधिक योगदान है।

CO3- हिन्दी काव्य गद्य के विभिन्न विधाओं का परिचय।

CO4- हिन्दी व्याकरण के माध्यम से परिनिष्ठित एवं परिमार्जित भाषा का बोध।

CO5- भाषा संबंधी अशुद्धियों का समावेश।

स्नातक द्वितीय वर्ष आधार पाठ्क्रम (हिन्दी)

(बी.ए./बी.कॉम कम्प्युटर/बी.कॉम टैक्स/बी.एस.सी/बीबीए/बीसीए)

पाठ्यक्रम का नाम : प्रथम प्रश्न पत्र- हिन्दी भाषा और नैतिक मूल्य

पाठ्यक्रम परिणाम :

CO1- हिन्दी भाषा एवं नैतिक मूल्य से जुड़ी इकाइयों का समावेश किया गया है
CO2- संस्कृति के संरक्षण संवर्धन और प्रसार में सहयोग।
CO3- भाषा बोध एवं अभिव्यक्ति कौशल का विकास।
CO4- वैचारिक एवं भावनात्मक समरसता विकसित करने में सहयोगी।
CO5- सर्जनक्षमता का विकास।

स्नातक तृतीय वर्ष आधार पाठ्क्रम (हिन्दी)

(बी.ए./बी.कॉम कम्प्युटर/बी.कॉम टेक्स/बी.एस.सी/बीबीए/बीसीए)

पाठ्यक्रम का नाम: प्रथम प्रश्न पत्र- हिन्दी भाषा और नैतिक मूल्य

पाठ्यक्रम परिणाम:

CO1- विश्व में प्रचलित विभिन्न धर्मो के ज्ञान के द्वारा व्यापक दृष्टि का प्रसार।
CO2- महापुरूषों के आदर्श जीवन की जानकारी।
CO3- मध्यप्रदेश की कला साहित्य संस्कृति की जानकारी के माध्यम से आत्मीयता का प्रसार।
CO4- हिन्दी व्याकरण पत्रकारिता का व्यापक ज्ञान।
CO5- अनुवाद कौशल के द्वारा रोजगारोन्मुखी दृष्टिकोण का विकास।

एम.ए ''हिंन्दीं साहित्य'' का कार्यक्रम परिणाम

हिन्दी अपना स्थान विश्व पटल पर बनायें हुये हैं अभिव्यक्ति एवं रोजगार की दृष्टि से हिन्दी का महत्वपूर्ण स्थान हैं राज्य एवं केन्द्र स्तर की प्रतियोगी परीक्षओं में हिन्दी का महत्वपूर्ण योगदान हैं। UPSC% परीक्षा का कोर्स प्रतियोगी परीक्षा के कोर्स से लगभग 70% मिलता है। स्नातकोत्तर कक्षाओं में पढ़ाये जाने वाले प्रश्नपत्रों के नाम।

एम.ए ''हिन्दी साहित्य'' प्रथम सेमेस्टर

पाठ्यक्रम का नाम: प्रथम प्रश्न पत्र:- प्राचीन एवं मध्यकालीन काव्य

पाठ्यक्रम परिणाम

पाठ्यक्रम में निर्धारित प्रश्न पत्र विद्यार्थियों को निम्नलिखित अधिगम प्रदान करता है।

CO1- प्राचीन एवं मध्यकालीन साहित्य को समझने की व्यापक दृष्टि प्रदान करता है।
CO2- प्राचीन एवं मध्यकाल की भाषा के क्रमिक विकास समझने में सहायक हैं।
CO3- साहित्य के माध्यम से संत कवियों द्वारा किये गये सामाजिक सुधारों की जानकारी।
CO4- हिन्दी काव्य परम्परा में सूफी मत का महत्व का बोध।

पाठ्यक्रम का नाम: द्वितीय प्रश्न पत्र:- आधुनिक गद्य एवं उसका इतिहास

पाठ्यक्रम परिणाम:

CO1- रंगमचीन अवबोध।
CO2- उपन्यास के माध्यम से ग्राम्य जीवन का बोध एवं मनोवैज्ञानिक दृष्टिकोण का विकास।
CO3- मध्यवर्गीय जीवन दृष्टि का ज्ञान।
CO4- इतिहास एवं साहित्य के सुन्दर समन्वय का बोध।

पाठ्यक्रम का नाम: तृतीय प्रश्न पत्र- भारतीय एवं पाश्चात्य काव्य शास्त्र

पाठ्यक्रम परिणाम:

CO1- साहित्य के विभिन्न सिद्धांतो का परिचय।
CO2- भारतीय काव्य शास्त्र के सिद्धांतों का साहित्य में योगदान।

CO3- भारतीय काव्यशास्त्र के आचार्यो का योगदान, रस सिद्धांत के साधारणीकरण के परिचय के अध्ययन से जीवन के प्रति नवीन दृष्टि कोण का विकास।

पाठ्यक्रम का नाम: चतुर्थ प्रश्न पत्र- हिन्दी साहित्य का इतिहास एवं सांस्कृतिक पृष्ठभूमि

पाठ्यक्रम परिणाम:

CO1- इतिहास लेखन की सुदीर्घ परम्परा ये छात्रों को अवगत करना।
CO2- सांस्कृतिक परम्परा उसके महत्व का निरूपण।
CO3- विभिन्न कालों की सामाजिक आर्थिक एवं राजनैतिक परिस्थितियों के अनुरूप साहित्य के विकास का परिचय।

एम.ए ''हिन्दी साहित्य'' द्वितीय सेमेस्टर

पाठ्यक्रम का नाम:प्रथम प्रश्न पत्र:- प्राचीन एवं मध्यकालीन काव्य

पाठ्यक्रम परिणाम:

CO1- पाठ्यक्रम में निर्धारित प्रश्न पत्र विद्यार्थियों को निम्नलिखित अधिगम प्रदान करता है।भक्ति विषयक भक्ति कालीन एवं रीति कालीन आवधारणा से परिचय।
CO2- भ्रमर गीत की समुन्नत परम्परा का बोध।
CO3- रीति सिद्ध एवं रीति मुक्त काव्य धारा की जानकारी।
CO4- विभिन्न कालों में विषय विविधता का बोध।

पाठ्यक्रम का नाम: द्वितीय प्रश्न पत्र:- आधुनिक हिन्दी गद्य और उसका इतिहास

पाठ्यक्रम परिणाम:

CO1- हिन्दी गद्य के क्रमिक विकास से परिचय।
CO2- रंगकर्म एवं गद्य की निबन्ध, उपन्यास, कहानी व अन्य विधाओं के माध्यम से जीवन से जुड़ी विभिन्न समस्याओं एवं उनके निराकरण की जानकारी।
CO3- गद्य विकास में युगानुरूप नवीन विषयों के समावेश के दृष्टिकोण का विकास।
CO4- साहित्य में समाविष्ट अन्य विषयों की जानकारी का अर्जन।

पाठ्यक्रम का नाम: तृतीय प्रश्न पत्र:- भारतीय एवं पाश्चात्य काव्यशास्त्र

पाठ्यक्रम परिणाम:

CO1- पाश्चात्य साहित्य के विभिन्न सिद्धान्तों एवं वादों का परिचय।
CO2- पाश्चात्य काव्यशास्त्र के सिद्धान्तों पर आधारित साहित्य का जीवन पर प्रभाव का अध्ययन।
CO3- आधुनिक समीक्षा की विभिन्न प्रवृतियों का ज्ञान।
CO4- औदात्य सिद्धांत एवं कल्पना सिद्धांत द्वारा जीवन-दर्शन का बोध।

पाठ्यक्रम का नाम: चतुर्थ प्रश्न पत्र:- हिन्दी साहित्य का इतिहास एवं सास्कृतिक पृष्टभू**मि**

पाठ्यक्रम परिणाम:

CO1- आधुनिक काल की सामाजिक आर्थिक राजनैतिक एवं सास्कृतिक पृष्ठभूमि का ज्ञान।
CO2- गद्य के क्रमिक विकास का बोध।
CO3- साहित्य जगत के नये वाद एवं पुरष्कृत रचनाकारों की जानकारी।
CO4- हिन्दी आलोचना एवं अस्मिता मूलक नयें विमर्शो का ज्ञान।

एम.ए ''हिंन्दीं साहित्य'' तृतीय सेमेस्टर

पाठ्यक्रम का नाम: प्रथम प्रश्न पत्र- आधुनिक हिन्दी काव्य ।

पाठ्यक्रम परिणाम:

CO1- राष्ट्रकवि मैथलीशरण गुप्त एवं जयशंकर प्रसाद की महाकाव्यत्मक रचना कामायनी का परिचय एवं जीवन मूल्य का विकास।
CO2- छायावादी रचना शैली की विशिष्टिताओं का परिचय।
CO3- आधुनिक काल में विकसित राष्ट्रीय त्रेतना एवं देश प्रेम की भावाना का बोध।
CO4- पौराणिक कथा एवं पात्रो के संदर्भ में नवीन ज्ञानदृष्टि।

पाठ्यक्रम का नाम: द्वितीय प्रश्न पत्र- भाषा विज्ञान एवं हिन्दी भाषा।

पाठ्यक्रम परिणाम:

CO1- भाषाविज्ञान के अंतर्गत भाषा विज्ञान हैं, स्वर एवं व्यंजन के उच्चारण की वैज्ञानिक अवधारणा का परिचय एवं उसका महत्व।
CO2- विविध बोलियों एवं भाषाओं का व्यापक ज्ञान।
CO3- अनुवाद विज्ञान का परिचय।
CO4- अर्थ विज्ञान, वाक्य विज्ञान का परिचय एवं भाषा विज्ञान के वैज्ञानिक अध्ययन द्वारा सूक्ष्म दृष्टिकोण का विकास।

पाठ्यक्रम का नाम: तृतीय प्रश्न पत्र -नाटक निबंध एवं अन्य विधायें।

पाठ्यक्रम परिणाम:

CO1- रंगमंच के क्रमिक विकास की जानकारी।
CO2- सामाजिक रूढ़ियों एवं अंध विश्वासों के विरूद्ध नवीन दृष्टिबोध।
CO3- साहित्य एवं इतिहास के समन्वय का बोध।
CO4- पौराणिक व्याख्यों के माध्यम से आधुनिक मूल्य बोध का विकास।

पाठ्यक्रम का नाम: चतुर्थ प्रश्न पत्र:- सूरदास।

पाठ्यक्रम परिणाम:

CO1- सूर साहित्य की सार्वकालिकता एवं सार्वभौमिकता का परिचय।
CO2- आज की प्रासंगिता में वात्सल्य एवं सृगांर का योगदान।
CO3- भक्ति-की सुदीर्घ परम्परा का बोध।
CO4- सूर साहित्य की चरवाहा संस्कृति एवं साम्यवाद की दृष्टि का विकास।

एम.ए ''हिंन्दीं साहित्य'' चतुर्थ सेमेस्टर

पाठ्यक्रम का नाम: प्रथम प्रश्न पत्र:- आधुनिक काव्य

पाठ्यक्रम परिणाम:

CO1- साहित्य में विकसित नवीन बोध एवं वादों की जानकारी।
CO2- मुक्तिबोध के काव्य के अध्ययन से नवीनदृष्टि एवं ज्ञान के वास्तविक रूप का परिचय।
CO3- अज्ञेय के माध्यम से यथावर संस्कृति का बोध एवं महत्व के प्रति नवीन दृष्टि का विकास।
CO4- समाज के अनछुये विषयों को साहित्य का विषय बनाने के ज्ञान का विकास।

पाठ्यक्रम का नाम: द्वितीय प्रश्न पत्र:- भाषा विज्ञान एवं हिन्दी भाषा

पाठ्यक्रम परिणाम:

CO1- हिन्दी की ऐतिहासिक पृष्ठभूमि का बोध।
CO2- भौगोलिक विस्तार की दृष्टि से हिन्दी और उसकी उपबोलियों को ज्ञान।
CO3- हिन्दी की भाषिक संरचना एवं व्याकरण का व्यापक ज्ञान।
CO4- कम्प्यूटर के क्षेत्र में हिन्दी के नवीनतम संसाधनों की जानकारी।

पाठ्यक्रम का नाम: तृतीय प्रश्न पत्र:- नाटक निबंध एवं अन्य विधायें

पाठ्यक्रम परिणाम:

CO1- हिन्दी गद्य की मुख्य एवं गौण विधाओं का परिचय।
CO2- निर्धारित निबंधों के माध्यम से मनोवैज्ञानिक एवं भारतीय संस्कृति विषयक दृष्टिकोण का विकास।
CO3- समाज की विद्रुपताओं पर व्यंग्य के माध्यम से किये गये कटाक्ष और उसके महत्व का निरूपण।

पाठ्यक्रम का नाम: चतुर्थ प्रश्न पत्र:- सूरदास

पाठ्यक्रम परिणाम:

CO1- भ्रमरगीत परम्परा का अध्ययन एवं बोध।
CO2- वाग्वैदग्धता एवं कूटपदों की अवधारणा।
CO3- सगुण भक्ति उपासना का प्रतिपादन।

DEPARTMENT OF ENGLISH

Programme Outcomes, Programme Specific Outcomes and Course Outcomes

BA

Programme Outcomes:

- **Critical Thinking**: Take informed actions after identifying the assumptions that frame our thinking and actions, checking out the degree to which these assumptions are accurate and valid, and looking at our ideas and decisions (intellectual, organizational, and personal) from different perspectives.
- **Effective Communication**: Speak, read, write and listen clearly in person and through electronic media in English and in one Indian language, and make meaning of the world by connecting people, ideas, books, media and technology.
- **Social Interaction**: Elicit views of others, mediate disagreements and help reach conclusions in group settings.

- **Effective Citizenship**: Demonstrate empathetic social concern and equity centred national development, and the ability to act with an informed awareness of issues and participate in civic life through volunteering.
- **Ethics**: Recognize different value systems including your own, understand the moral dimensions of your decisions, and accept responsibility for them.
- **Environment and Sustainability**: Understand the issues of environmental contexts and sustainable development.
- **Self-directed and Life-long Learning**: Acquire the ability to engage in independent and life-long learning in the broadest context ofsocio-technological changes.

BA /BSc/ BCom I Year: Foundation Course

Course Outcomes:

After the completion of this course the students will be able to:

- Prepare for various competitive exams by developing their English language competency.
- Promote their comprehension skills by being exposed to a variety of texts and their interpretation.
- Build and enhance their vocabulary.
- Develop their communication skills by strengthening grammar and usages.
- Inculcate values which make them aware of national heritage and be responsible citizens.

BA /BSc/ BCom II Year: Foundation Course

Course Learning Outcomes :-

To study this course, a student should have the basic knowledge of the English language.
This course is designed for all the students of UG Second Year under the Foundation Course category.

Through this course the students will be able to:

- Strengthen their grammer and vocabulary.
- Acquire and develop LSRW (Listening, Speaking, Reading and Writing)
- A Learn to think creatively and critically.

After the completion of the course, students are expected to gain competency and proficiency in English language to perform at professional and personal level as well as to face competitive examinations at state and National level.

BA /BSc/ BCom III Year: Foundation Course

Course Outcomes:

After the completion of this course, students will be able to-

- Transform the sentences from direct to indirect.
- Describe nature and types of poetry.
- Write about short Story and its basic elements.
- Know about the concept of essays and its types.
- Have knowledge about report writing and narrative skills.
- Learn about precis writing and drafting the CV.

BA I Year English Literature

Programme Specific Outcomes

PSO1- To develop basic knowledge of literary devices, forms and techniques in order to appreciate and interpret the text.
PSO2- To develop language and communication skills and creativity.
PSO3- To develop analytical skills and develop critical thinking skills.
PSO4- To familiarize with different cultures and social structures.
PSO5- Inculcate feelings of togetherness, empathy and harmony.
PSO6- To cultivate wisdom and world-view within themselves.

Course Title: (Major)Paper I- Study of Poetry
Course Outcomes:

The study of poetry will not only instruct and delight the students, but also inspire them to have positivity, creativity and a new way of thinking. After completion of this paper the students will be able to –

- Identify, interpret, analyze and appreciate the various elements of poetry.
- Appreciate the lyrical and sonorous quality of poetry and its various forms.
- Analyse Metaphysical poetry and its important elements.
- Develop a taste for poetry reading and writing; learn about poetic devices in English Literature.
- Enhance their knowledge about English my theology and culture
- Describe Neo-classical Age and major and minor writers and their works
- Learn about Romantic Age, Nature Poets and their writings and its elements.

Course Title: (Minor)Paper II–Study of Prose

Course Outcomes:

After the completion of this course, the students will come to know about:

- Prose and its other forms.
- Definition of essay, essayists of different ages and their styles.

- Periodicals famous in different ages and their different approaches.
- Literary techniques to write non-fictional works.
- Literary taste and approaches of different essayists.

BA II Year (English Literature)

Course Learning Outcomes
(Generic Elective)
Course Title – Translation Studies

The Course is based on the needs and merits required in translation. The study of this paper will enable the students to –

- Understand the concept of translation studies in the theoretical field.
- Familiarze with approaches to translation, there by contextualizing the discipline in general terms.
- Understand the process of translation, demonstrate and apply enhanced Knowledge of English as related to translation practices.
- Achiece effective communication with people from different corners of the world.
- Protect culrural heritage and benefit from transmission of knowledge.
- Understand structural difference between the two languages, and
- Expand the knowledge of the vocabulary and collocational aspects of the target language.

Major– I (Studies of Prose)

After completion of this course, the students will be able to:

- Analyze literary devices, forms and techniques in order to appreciate and interpret the text,
- Broaden analytical skills and develop critical thinking skills.
- Cultivate wisdom and world view within themselves, and
- Develop language and communication skills and creativity.

Major– II/Minor/Optional (Studies of Fiction)

On the completion of this course the students will be able to engage with different narrative forms and views in ficton dealing with simple and complex issues. The course will motivate the students to:

- Understand various aspects and forms of fiction.
- Trace the origin and development of English novel.
- Appreciate morality and humanity.
- Improve the understanding of the world and the complexities of human mind; and
- Expand creativity and imagination and enrich the vocabulary in a delightful manner.

BA III Year (English Literature)

Course Title : Paper I -Contemporary Literature

Course Outcomes

Contemporary Literature allows students to explore the most recent literature being written. The goals of this course include the following:

- To become familiar with the very best fiction, nonfiction, drama and poetry of the last twenty years.
- To develop the necessary interest to read the works of contemporary literature.
- To gain a better understanding of the techniques and ethics involved in using secondary sources.
- To develop the ability to write critical exposition.
- To develop vocabulary through the use of literary terms and the author's diction.

Course Title Paper II– Indian Writing in English

Course Outcomes

After completing this course, the students would gain insight into 'Indianness' through representative works. Students will able to –

- Appreciate the historical trajectory of various genres of Indian Writing in English from colonial times till the present.
- Analyse Indian literary texts written in English in colonial, post-colonial period and recognize regional and national approaches of writers.
- Understand the role of English as a medium for political awakening and the use of English in India for creative writing.
- Evaluate critically the contributions of major Indian English poets, novelists and dramatists.
- Develop a literary sensibility and display an emotional response to the literary texts and cultivate a sense of appreciation for them
- Apply the ideas encapsulated in Indian Aesthetics to literary texts.

MA English Literature

Programme Specific Outcomes (PSOs):

- **Reading:** Postgraduate students will become accomplished, active readers who can articulate their own interpretations & perspectives.
- **Writing Skills:** Students will be able to write effectively for a variety of professional & social settings.

- **Sense of Genre:** Students will develop an appreciation for the elements of language, diction, syntax, rhetorical statements for a variety of genres as poetry, prose, fiction & drama etc.
- **Critical approaches:** Students will develop the ability to read works of literary, rhetorical and cultural criticismand deploy ideas from these texts in their own writing.
- **Culture & History:** Students will gain knowledge of the major traditions of literatures written in English and wouldbe able to appreciate the diversity of literary & social voices within those traditions.
- **Research Skills:** Students will be able to identify topics & formulate questions for productive inquiry; they will identify appropriate methods & sources for research & evaluate critically literary texts.
- **Communication Skills:** Students will demonstrate the skills needed to participate in conversation; articulate their own ideas clearly in creative writing.

Programme: MA - I and II Semester

Course Title Paper I- Poetry

Course Outcomes

After the completion of this course the students will be able to-

- Become familiar with different kinds of British poetry such as narrative poetry, sonnet, elegy, satire, ode, epic, mock-epic and metaphysical poetry.
- Study the development of different poetic genres as a means of articulating personal, cultural and political concerns. Identify various elements of poetry such as figures of speech, symbolism, theme etc.
- Develop the understanding of rhyme, rhythms, metre, and prosody through various themes.
- Develop creative writing skills and experiment with new trends.
- Acquire natural rhythm of speech and become better communicators.
- Understand the aesthetic and political shifts in poetry and philosophy towards modernity.

Course Title : Paper II - Drama

Course Outcomes

After completion of this course the students will know about origin of Western drama, Greek drama, Roman drama, Indian drama and the whole journey of drama; types of drama and basic elements of drama. The students will be able to-

- Demonstrate the understanding of the social and artistic movements that have shaped theater and dance as we know it today.
- Analyze and interpret texts and performance both in writing and orally.
- Develop collaborative skills in various theatrical contexts.
- Demonstrate problem solving skills in the creation of artistic reflection.
- Explore different aspects of theatrical drama.

Course Title : Paper III - Fiction

Course Outcomes

After the completion of the course students will be able to-

- Take up the special studies in language and literature.
- Introduce them to different cultures and social structures.
- Develop a sense of humanity and good conduct with the learnings of fiction.
- Build their confidence in handling of English language, inculcates feelings of togetherness, empathy and harmony.
- Develop their intellectual flexibility, creativity and cultural literacy.
- Build interest to write short stories and script writing.
- Work as journalist, freelance writer, commentator, translator, educator.

Course Title : Paper IV - Prose

Course Outcomes

After the completion of the course, students will be able to:

- Understand a passage and grasp its meaning.
- Read essays of eminent writers like Bacon, Addison, Lamb, Gardiner etc. comprehend and explain the themes of the essays.
- Improve creative and critical skills which will lead them to various career options in print media.
- Become competent.
- Develop report writing skills which would accommodate them as editors, reporters, and content writer in newspapers.

Programme: MA – III and IV Semester

Course Title : Paper I - Critical Theory

Course Outcomes

After the completion of the course, the students will be able to**:**

- Familiar with critical writing through the study of canonical texts from representative ages.
- Understand critical perspective and terminology.
- Develop a better understanding of the function of criticism.
- Apply ancient critical theories to contemporary texts.
- Develop their critical, sensible and logical thinking.

- Identify the literary devices used in unseen passages.
- Learn about practical criticismon the basis of the theories prescribed in the course.

Course Title: Paper II - English Language

Course Outcomes: After the completion of this course, students will become familiar with:

- The growth and development of English Language and contribution of different theorists.
- The theories of language learning.
- The difference between language and linguistics.
- Various approaches and methods to linguistics.
- Tools to measure language proficiency of learners.
- Speech organism, mechanism and articulation of speech sound.

Course Title: Paper III- Indian Writing in English

Course Outcomes

After the completion of the course the students will be able to-

- Be introduced to a wide range of Indian Writing in English.
- Know about the trends and techniques in Indian Writing in English
- Critically appreciate the representation of culture, identity, history, national and gender politics, in the prescribed text.
- Familiarize themselves with the emergence & growth of Indian Writing in English.
- Be aware of social, political &cultural issues reflected in Indian Writing in English
- To develop sensibility and emotions with the purpose to enable them to relish literature.

Course Title: Paper IV- American Literatur**e**

Course Outcomes

After completion of the course the students will acquire the knowledge of different genre of American drama, comedy, tragedy, epic theatre. The students will be able to-

- Understand the distinctive features of American Literature.
- Identify the relationship between various movements in American history, colonialism and culture.
- Interpret literature as it relates to its historical, cultural, and political context.
- Interpret literary works using critical perspectives.
- Develop their creative thinking and ability.

DEPARTMENT OF SANSKRIT

B.A. Sanskrit

कार्यक्रम के परिणाम Program outcome 2021-2022

PO1-संस्कृत सर्वप्राचीन एवं व्याकरण के नियमों से बंधी हुई व्यवस्थित भाषा है।

PO2-संस्कृत को देवभाषा की पदवी प्राप्त है क्योंकि देवों के एवं सभ्य समाज के विचार विनमय की प्रथम भाषा संस्कृत थी।

PO3-सर्वप्राचीन साहित्य भी संस्कृत में {ऋग्वेद} आदि में प्राप्त है । संस्कृत भाषा चारों युगों में अपरिवर्तनीय है।

PO4-और संस्कृत का विशाल शब्द भण्डार भी संस्कृत भाषा को सर्वजन सुलभ बना देता है।

PO5-संस्कृत में वर्तमान समय तक लिखा जा रहा साहित्य संस्कृत को पाठकों में रुचि बढ़ाने का कार्य करता है।

PO6-संस्कृत स्नातक कक्षाओं का पाठ्यक्रम भी प्रतियोगी परिक्षाओं को पूर्ण रूप से ध्यान देकर बनाया गया है।

PO7-परिणामत: प्रतियोगी परिक्षा में विद्यार्थी अन्य प्रयास के विना भी सफल हो जाते हैं।

PO8-प्रकृति और पर्यावरण संरक्षण की प्रेरणा मिलेगी.

PO9- प्राचीन देवताओं और यज्ञ विधाओं से छात्र परिचित होंगे।

PO10 विश्व धरोहरों ऋग्वेद के ज्ञान से छात्र लाभान्वित हों

कार्यक्रम विशिष्ट परिणाम (Program Specific outcome)

B.A. Sanskrit

PSO1-स्नातक पाठ्यक्रम के अध्ययन से छात्र अपने प्राचीन इतिहास एवं सर्वजनग्राह्य मूल्यों से अवगत हो जाते हैं।

PSO2-संस्कृत भाषा में लिखे ग्रन्थों के अध्ययन एवं उनके गूढ़ अर्थों को समझने की क्षमता का विकास हो जाता है।

PSO3-स्नातक कक्षाओं में संस्कृत अध्ययन से स्नातकोत्तर कक्षाओं में प्रवेश मिलना आसान रहता है।

PSO4-विद्यार्थी स्नातक कक्षा में संस्कृत अध्ययन से UPSC की परीक्षा के लिए संस्कृत विषय एक उत्तम विकल्प होता है।

बी. ए. 1 Year

प्रश्नपत्र -1 Mejor-1**वेद व्याकरण एवं भाषा नैपुण्य**।

Course Outcomes

CO1-वैदिक संस्कृत एवं लौकिक संस्कृत का छात्र ज्ञान प्राप्त करेंगे।

CO2-वैदिक साहित्य (वेद ब्राह्मणग्रन्थादि) एवं लौकिक साहित्य रामायण महाभारत आदि का कथा प्रसंग छात्रों में नैतिक मूल्यों का विकास करते हैं।

CO3-वैदिक सूक्तों से छात्रों में मन की इच्छा शक्ति का संदेश अपने कार्य पर विजय प्राप्ति का संदेश एवं अग्नि के महत्व
को समझेंगे।

CO4-संस्कृत संभाषण में छात्र प्रवीणता प्राप्त करेंगे । फलत: धातुरूप एवं शब्द रूप को स्मरण करके अपने शब्द भण्डार
को विकसित करेंगे ।

CO5-संस्कृत अनुवाद को सीखने के लिए छात्रों को विभक्ति एवं कारकों का ज्ञान कराया जायेगा

CO6-भाषा को सरल रुचिकर एवं साहित्यक बनाने के लिए छात्र संधिओं का ज्ञान प्राप्त करेंगे ।

बी. ए. 1 Year Major-2, Minor, elec.

प्रश्नपत्र का शीर्षक - आर्षकाव्य एवं लौकिक काव्य

CO1- रामायण की संपूर्ण कथावस्तु को पढ़कर छात्रों में मर्यादा, भक्ति, प्रीत, नीति, रीति, एवं एक आदर्श पत्नी एवं आदर्श भाई के कर्तव्यों से छात्र परिचित होंगे ।

CO2- शान्तिपर्व में धर्म पर्व शान्ति है। गया किया निरूपण विशद का ज्ञान अध्यात्म और राजानीति ,दर्शन , में युद्ध की समाप्ति
पर भीष्म के द्वारा श्रीकृष्ण की स्तुति भीष्म द्वारा युधिष्ठिर के प्रश्नों का उत्तर तथा उन्हें राजधर्म , मोक्षधर्म और आपद्धर्म
का बोध का ज्ञान प्राप्त करेंगे ।

CO3-रघुवंश की कथावस्तु का ज्ञान प्राप्त करेंगे।साथ ही दिलीप एवं सुदक्षिणा से गौभक्ति से फल सिद्धि को भी छात्र समझेंगे ।

CO4-मेघदूत काव्य से प्रेम की महत्ता एवं कवि कालिदास के सूक्ष्म चिंतन से छात्र परिचित होंगे ।साथ ही लघुत्रयी एवं बृहत्त्रयी
का ज्ञान प्राप्त करेंगे ।

CO5- रामायण की सार्वकालिक एवं सार्वजनीन विशेषता से छात्र परिचित होंगे ।

CO6- भारतीय संस्कृति का अववोध एवं महापुरुषों के जीवन से छात्र प्रेरणा लेंगे ।

CO7- रंगमंचीय कौशल का ज्ञान प्राप्त करेंगे ।

बी. ए. 2 Year

fo"k; & laLd`r ¼estj½

x| n'kZu ,oa O;kdj.k ¼iz'ui= 1½

¼dkslZ yfuZax vkmVde½

1- Nk=ksa ds pkfjf=d fodkl esa vR;ar mi;ksxh

2- lkoZHkkSfed n`f"V ls vk/;kfRed mUu;u esa lgk;dA

3- Hkkjrh; nk'kZfud fpUru dh oSKkfudrk dk vocks/kA

4- Hkkjrh; laLd`fr ,oa dykvksa ls ifjfpr djkukA

5- Nk=ksa ds ckSf)d ,oa ekufld fodkl ds lkFk Hkk"kk vocks/k gsrqA

6- Nk=ksa dks dkO; fo|k ys[ku dh dyk esa n{k cukukA

7- laLd`r esa okD; fuekZ.k vkSj iz;ksx dk Kku djkukA

8- laLd`r esa vuqokn ,oa laHkk"k.k dkS'ky dk fodklA

egkdkO; ,oa ukVd ¼iz'ui= 2½

oSdfYid

ikB~;Øe v/;;u dh ifjyfC/k;kW &

1- Nk=ksa dks dkO; fo/kkvksa ls ifjfpr djkukA

2- Nk=ksa dks vkJe ds fu;eksa rFkk xkS lsok dh efgek dk cks/k djkukA

3- ukV~;'kkL=h; rRoksa dk KkuA

4- jaxeaph; iz;ksx rFkk ukV~; ys[ku dh fo|k dk ifjp;A

5- Nk=ksa esa vfHku; dyk dk fodkl rFkk vfHk:fp laoa/kZuA

6- Nk=ksa dks izkphu ukV~;dkjksa ,oa mudh d`fr;ksa ls ifjfpr djkukA

7- Nk=ksa dks thou eqY;ksa ,oa uSfrd nkf;Ro dh f'k{kk iznku djkukA

बी. ए. 3 Year ,

प्रश्नपत्र -1

प्रश्नपत्र का शीर्षक - काव्य व्याकरण और भाषा विज्ञान

CO1-भगवद्गीता के अध्ययन से कर्म के प्रति आस्था एवं आलस्य का त्याग द्वितीय अध्याय के अध्ययन से अपने धर्म के प्रति पूर्ण निष्ठा एवं संबंधों के प्रति उचित आचरण कैसे करें यह सिखाया जायेगा।

CO2-पंचतंत्र की नीति कथाओं से छात्र राजनीति युद्ध नीति कूटनीति मित्रता आदि गुणों को सीखेंगे एवं अवगुणों से दूरी कैसे बनाई जाये इसको भी जानेंगे।

CO3-उपनिषद् के माध्यम से छात्र ईश्वर के स्वरूप को समझेंगे। साथ ही कर्म करने के लिए तत्पर रहेंगे। विद्या और अविद्या के स्वरूप को भी जानेंगे।

CO4-शब्दों में धातु और प्रत्यय दो अवयव होते हैं।छात्र धातु एवं प्रत्ययों का ज्ञान प्राप्त करेंगे।

CO5-विचार विनमय की साधिका भाषा के स्वरूप के साथ साथ भाषाविज्ञान की अनेकों शाखाओं से परिचित होंगे। ध्वनि विज्ञान अर्थ विज्ञान एवं वाक्य विज्ञान को जानेंगे।

बी. ए. 3 Year , प्रश्नपत्र -2 काव्य रस ,छन्द ,एवं अलंकार

CO1- महाभारत में वर्णित किरात वेशधारी शिव के साथ अर्जुन के युद्ध की लघुकथा को आधार बनाकर राजनीति, धर्मनीति, कूटनीति, समाजनीति, युद्धनीति, जनजीवन आदि के बारे में जानेंगे।

CO2- पाण्डवों के द्वारा युद्ध रोकने के लिए पांच गांव मांगना एवं कौरवों द्वारा शूई के नोक बराबर जगह न देना इससे हम कौरवों के हठधर्मिता से परिचित होंगे कृष्ण के नीतियों से छात्रों विशिष्ट रूप से अवगत होंगे.

CO3- उत्तरराम चरितम् कथानक में राम को लोकपुरुष मर्यादा पुरुषोत्तम राम बताया है , राम को प्रजा प्रेम सर्वोपरि है , राजधर्म से परिचित होंगे।

CO4- नीति शतक में एक ओर तो उसने अज्ञता, लोभ, धन, दुर्जनता, अहंकार आदि की निन्दा की है तो दूसरी ओर विद्या, सज्जनता, उदारता, स्वाभिमान, सहनशीलता, सत्य आदि गुणों की प्रशंसा भी की है। छात्रों इससे लाभान्वित होंगे।

CO5- नीतिशतक में 10 पद्धतियों में मूर्ख पद्धति , विद्वत् पद्धति आदि से भी तत् तत् विषय से परिचित होंगे।

CO6- महाकाव्य ,गीतिकाव्य ,एवं चम्पू काव्य के स्वरूप को जानेंगे।

M.A. Sanskrit

कार्यक्रम के परिणाम (Program outcome)

PO1-संस्कृत भाषा के महत्व को देखते हुए। संस्कृत को भारतीय संविधान की 8 वीं अनुसूची में स्थान दिया गया है

PO2-M.A. संस्कृत के पाठ्यक्रम के अध्ययन से ही छात्रों M Fill PH.D. में प्रवेश लेना आसान हो जाता है।

PO3-पाठ्यक्रम के अध्ययन से संभाषण कौशल एवं संस्कृत साहित्य ,वेद दर्शन एवं नाटक आदि ग्रंथों की समझ विकसित होती है।

PO4-साथ ही मानवीय मूल्यों का संरक्षण एवं वर्धन होता है।

कार्यक्रम विशिष्ट परिणाम (Program Specific outcome)

PSO1-स्नातकोत्तर पाठ्यक्रम से विद्यार्थी अपने प्राचीन संस्कृत साहित्य के इतिहास से परिचित होते हैं।

PSO2-संस्कृति एवं संस्कृत एवं मानवीय मूल्यों की भावना से युक्त होते हैं।

PSO3-पाठ्यक्रम के अध्ययन से M Phill PH.D. में प्रवेश आसानी से मिल जाता है।

PSO4-पाठ्यक्रम के अध्ययन से शिक्षक परीक्षा प्राध्यापक परीक्षा NET आदि परीक्षाओं में छात्र सफल होते हैं

PSO5-छात्र संस्कृत के अध्ययन से धर्मगुरु, समाचार पत्र वाचक एवं कम्प्यूटर की प्रोग्रामिंग के लिए भी नौकरियों के अवसर प्राप्त होंगे।

एम. ए. 1 Sem

प्रश्नपत्र -1

प्रश्नपत्र का शीर्षक - वेद

CO1-अग्नि सूक्त , इन्द्र सूक्त , पर्जन्य सूक्त , वाक् सूक्त आदि के माध्यम से छात्र जल की उपयोगिता अग्नि की उपयोगिता वाणी

की उपयोगिता आदि का ज्ञान प्राप्त करेगे।

CO2-साथ संवाद सूक्तों के माध्यम से नदी उपयोगिता को जनेंगे।

CO3-नासदीय सूक्त के माध्यम से सृष्टि उत्पत्ति को जानेंगे। पुरुष सूक्त के माध्यम से ईश्वर के विराट स्वरूप को जानेंगे।

CO4-शिवसंकल्प सूक्त के माध्यम से काल्याण कारी भावनाओं से परिचित होंगे।उत्तम मन की कामना करेंगे।

CO5-राष्ट्र अभिवर्धन सूक्त के माध्यम से राष्ट्र की रक्षा के प्रति समर्पण भाव विकसित होगा।

CO6-पञ्च यज्ञों की उपयोगिता को जानेंगे। अतिथि सेवा पितृसेवा वनस्पति रक्षण की भावना का विकास होगा।

एम. ए. 1 Sem प्रश्नपत्र -2

प्रश्नपत्र का शीर्षक - वेदांग

CO1-निरुक्त के अध्ययन से क्रिया के स्वरूप को जानेंगे। वेदों के स्वरूप को जानेंगे।

CO2-आचार्य , अग्नि , आदि महत्वपूर्ण शब्दों के निर्वचन के माध्यम से निर्वचन करने की क्षमता विकास होगा।

CO3-ऋक्प्रातिशाख्य के माध्यम से वर्ण (अक्षर) व्यवस्था स्वर व्यवस्था वर्णों का उच्चारण स्थान आदि को जानेंगे।

CO4-पाणिनीय शिक्षा के माध्यम से स्वर व्यवस्था एवं पाठकों के उत्तम एवं अधम पाठकों से परिचित होंगे

CO5-वैदिक वाङ्मय के वारे में जानेंगे। वेद , ब्राह्मणग्रन्थ , आरण्यक , एवं वेदांगों का सामान्य परिचय प्राप्त करेंगे।

एम. ए. 1 Sem प्रश्नपत्र -3

प्रश्नपत्र का शीर्षक - पालि प्राकृत एवं भाषाविज्ञान

CO1-पालि एवं प्राकृत भाषा की विशेषताओं को जानेंगे। जातक कथाओं के माध्यम से जीवन के उद्देश्य एवं जीवन के लक्ष्यों का ज्ञान प्राप्त करेंगे।

CO2-अभिलेखों के अध्ययन से ऐतिहासिक समझ का विकास होगा एवं अभिलेखों में प्रदत्त विषयवस्तु के साथ विद्यार्थी में स्वत: विश्वास की भावना जागृत होती है।

CO3-भारतीय भाषाशास्त्रियों का अध्ययन करेंगे

CO4-भारोपीय भाषा परिवार का अध्ययन करेंगे। भाषाओं के समय को जानेंगे।

CO5-ध्वनि सिद्धांत , संकेतग्रह अभिहितान्वयवाद , अन्विताभिधानवाद के स्वरूप को जानेंगे।

एम. ए. 1 Sem प्रश्नपत्र -4

प्रश्नपत्र का शीर्षक - काव्य

CO1-मेघदूत का अध्ययन करेंगे। मेघदूत में वर्णित यक्ष यक्षिणी के दैविक प्रेम को जानेंगे प्रकृति सौंदर्य को जानेंगे।

CO2-अलकापुरी के लिए वर्णित प्रकृति चित्रण को जानेंगे। संदेश वाहक मेघ के मार्ग के लिए वर्णित पर्वतों एवं

नदियों को जानेंगे।

CO3-कुमार संभव में वर्णित पार्वती मां के अतिथि सत्कार से अतिथि सेवा की भावना का विकास होगा।

एम. ए. 2 Sem

प्रश्नपत्र - 1

प्रश्नपत्र का शीर्षक - भारतीय दर्शन

CO1-दर्शन शास्त्र के अध्ययन से सम्यक दर्शन (चिंतन)की शक्ति का विकास होगा।

CO2-दर्शनों के माध्यम जन्म मरण के सिद्धांत को समझेंगे।

CO3-दर्शनों के अध्ययन से कैवल्य प्राप्ति के रहस्य को जानेंगे।

CO4-दर्शन के अध्ययन से षोडश पदार्थों (प्रामण प्रमेय संशय)आदि को जानेंगे।

CO5-वेदान्तसार के अध्ययन से "अहं ब्रह्मास्मि "महावाक्य को आत्मसात करेंगे।

CO6-वेदान्तसार के अध्ययन से षड् प्रकार के कर्मों को जानेंगे।

CO7-नास्तिक दर्शन अर्थात् जो वेद को प्रमाण नहीं मानते उनके अध्ययन से कर्म के सिद्धान्त को विशेष रूप से महत्व देंगे।

एम. ए. 2 Sem प्रश्नपत्र - 2

प्रश्नपत्र का शीर्षक - सांख्य एवं मीमांसा।

CO1-सांख्य कारिका के अध्ययन से तीन प्रकार के दुखों से कैसे बचे उसके रहस्य को समझेंगे।

CO2-पच्चीस प्रकार के तत्व को जानकर ही दुःख निवृत्ति सम्भव है इसको जानेंगे।

CO3-सांख्य दर्शन के प्रमुख सिद्धांत सत्कार्यवाद से छात्र अवगत होंगे।

CO4-मीमांसा दर्शन में वर्णित वेदों के अपौरुषेयत्व को जानेंगे। शाब्दी भावना एवं अर्थी भावना से अवगत होंगे।

वेद प्रतिपादित धर्म को जानेंगे।

CO5-योगदर्शन के अध्ययन से चित्तवृत्ति निरोध , मोक्ष प्राप्ति एवं दुःख निवृत्ति को जानेंगे।

एम. ए. 2 Sem प्रश्नपत्र - 3

प्रश्नपत्र का शीर्षक – काव्यशास्त्र

CO1-प्रमुख काव्यशास्त्रीय सिद्धांत से छात्र लाभान्वित होंगे।

1. अलंकार सिद्धांत 2. रीति सिद्धांत 3.ध्वनि सिद्धांत
4.रस सिद्धांत 5.औचित्य सिद्धांत 6.वक्रोक्ति सिद्धांत।

CO2-काव्य प्रकाश के अनुसार काव्य का स्वरूप एवं काव्य के भेदों के बारे में बताया जायेगा और काव्य शक्तियों

के बारे में बताया जायेगा।

CO3-काव्य के स्वरूप एवं काव्य की महत्ता को बताया जायेगा।

CO4-साहित्य दर्पण के अनुसार रूपकों के भेद महाकाव्य का स्वरूप संधिया ,अर्थोपक्षेपक ,अर्थप्रकृतियां आदि का बोध कराया जायेगा।

CO5-ध्वन्यालोक के अनुसार काव्य स्वरूप को बताया जायेगा।

CO6-ध्वनि सिद्धान्त के विरोधी सिद्धांतों का खण्डन करके ध्वनिसिद्धांत- को ध्वन्यालोक के अनुसार बताया जायेगा।

एम. ए. 2 Sem प्रश्नपत्र - 4

प्रश्नपत्र का शीर्षक - भारतीय संस्कृति तथा पर्यावर

CO1-संस्कृत वाङ्मय के अनुसार धर्म को समझाया जायेगा। मुख्यरूप से धर्म के 10 लक्षणों को बताया जायेगा

CO2-भारतीय संस्कृति के बारे में जानेंगे।

CO3-संस्कृत साहित्य में वर्णित जीवन मूल्यों को जानेंगे।

CO4-पर्यावरण की महत्व को जानेंगे। जिससे पर्यावरण के प्रति जागरूक हो सकेंगे।

CO5-संस्कृत साहित्य के इतिहास से छात्र परिचित होते हैं। संस्कृत में हुये विभिन्न विषयो वाले साहित्य से छात्र जुड़ेंगे

एम. ए. 3 Sem

प्रश्नपत्र - 1

प्रश्नपत्र का शीर्षक - साहित्य शास्त्र

CO1-अलंकार प्रधान काव्यालंकार में वर्णित काव्य स्वरूप एवं काव्य के गुण एवं दोषों से छात्र अवगत होंगे साथ ही काव्य के भेदों को जानेंगे।

CO2-शास्त्रकाव्य एवं वाङ्मय काव्य के बारे में जानेंगे। छात्र के भेदों को जानेंगे।

1.बुद्धिमान 2. आहार्यबुद्धि 3.दुर्बुद्धि काव्य में प्राप्त होने वाले रस दोषों के बारे में छात्र जानेंगे।

CO4-काव्य गुणों को छात्र जानेंगे।

CO5-शब्दालंकार एवं अर्थालंकारों के ज्ञान से अवगत होंगे।

एम. ए. 3 Sem प्रश्नपत्र - 2

प्रश्नपत्र का शीर्षक - संस्कृत वाङ्मय एवं आधुनिक विश्व

CO1-विनयाधिकरण के प्रथम अधिकरण में विनयाधिकरण के समस्त प्रकणों से छात्र अवगत होंगे।

CO2-मानवीय मूल्यों को छात्र जानकर समाज के अनुसार अपने व्यक्तित्व को उत्कृष्ट करेंगे। साथ ही भारतीय संस्कृति के अनुसार जीवन जीने की कला सीखेंगे।

CO3-मनुस्मृति में वर्णित धर्म का स्वरूप। एवं आठ प्रकार के ब्राह्म ,आर्ष ,दैव गन्धर्व आदि विवाहों के महत्व को जानेंगे।

CO4-पुराणों में वर्णित कथानकों से शिक्षा प्राप्त करेंगे। शिव ,नारद , विष्णु आदि के चरित्र से अवगत होंगे।

एम. ए. 3 Sem प्रश्नपत्र - 3

प्रश्नपत्र का शीर्षक – महाकाव्य

CO1-नारद द्वारा वर्णित कृष्ण के चरित्र से छात्र शिक्षा प्राप्त करेंगे।

CO2-शिशुपाल के दुष्ट चरित्र से छात्र अपनी बुराई का दमन करेंगे।

CO3-रघुवंश में वर्णित महाराज रघु की दानशीलता को जानकर दान की भावना का विकास करेंगे।

CO4-महाकाव्यों के उद्भव एवं उसकी विकास प्रक्रिया से छात्र परिचित होंगे।

एम. ए. 3 Sem प्रश्नपत्र - 4

प्रश्नपत्र का शीर्षक - नाट्यशास्त्र

CO1नाट्यशांस्त्रीय चिंतकों से परिचित होंगे। वामन दण्डी भामह कालिदास , भवभूति आदि।

CO2-तीन प्रकार के प्रेक्षागृहों को जानेंगे।

(1)विकृष्ट (आयताकार लंबा) (2) चतुरस्त्र (वर्गाकार) और(3) त्र्यस्त्र (तिकोना)।

CO3-दशरूपक में वर्णित नायक एवं नायिका के भेदों को जानेंगे।

CO4-साथ ही शृंगार रस को जानेंगे।

CO5-दृश्य काव्य के अंतर्गत आने वाले 10 रूपकों को जानेंगे।

एम. ए. 4 Sem

प्रश्नपत्र - 1

प्रश्नपत्र का शीर्षक –

CO1-छात्र व्याकरण शास्त्र में उपयोगी संज्ञा सूत्रों से अवगत होंगे।

CO2-छात्र भाषा बोध एवं शास्त्र अध्ययन के लिए अति उपयोगी विभक्ति एवं करकों के बारे में ज्ञान प्राप्त करेंगे।

CO3-संस्कृत भाषा में निबंध लेखन सीखेंगे।

CO4-संस्कृत से हिन्दी एवं हिन्दी से संस्कृत में अनुवाद करना सीखेंगे।

एम. ए. 4 Sem प्रश्नपत्र - 2

प्रश्नपत्र का शीर्षक - रूपक

CO1-मृच्छकटिकम् की कथावस्तु का छात्र अध्ययन करेंगे।

CO2-कथावस्तु शासन वह साथ-ही -साथ है। डालता प्रकाश प्रचुर भी पर स्थिति-राज्य एवं व्यवस्था- भी का जीवन-नागरिक यथावत् चित्र अंकित करता है।

CO3-इसमें नगर की साज(क्रीड़ा-द्यूत) जुआ,प्रथा दास,व्यवहार का (वारांगनाओं) वेश्या ,सजावट-

CO4-विट की धूर्तताचौरक) चोरी,र्म ,(न्यायालय में न्यायनिर्णय की व्यवस्था प्रजा प्रति के राजा अवांछित, जनमत एवं द्रोह के के प्रभुत्त्व का सामाजिक स्वरूप भलीहै। गया किया चित्रित भाँति-

CO5-भट्टनारायण द्वारा रचित नाटक से छात्र अवगत होते हैं। द्रौपदी के अपने गलत का बदला तब पूर्ण होगा

CO6-जब दु:शासन के रक्त से चोटी के बाल नहीं रंगे जायेगें। इसी कथानक से ग्रन्थ नाम वेणीसंहार पड़ा। रत्नावली के अध्ययन से छात्र राजा हर्ष एवं रत्नावली के चरित्र से लाभान्वित होंगे।

एम. ए. 4 Sem प्रश्नपत्र - 3

प्रश्नपत्र का शीर्षक - गद्य पद्य चम्पू।

CO1-कादम्बरी में वर्णित पाञ्चाली रीति से युक्त महकवि बाणभट्ट के विशिष्ट

CO2-कथावस्तु प्रबंध को छात्र जानेंगे एवं समस्त पदों के बड़े बड़े प्रयोगों को सीखेंगे। साथ ही पुण्डरीक एवं महाश्वेता के अलौकिक प्रेम प्रसंग से अवगत होंगे।

CO3-रघुवंश के अध्ययन से राम एवं लघु दिल्ली दशरथ जैसे आदर्श बनने की प्रेरणा मिलती है।

CO4-जिसकी कथा अमृत को भी तिरस्कृत करने वाली श्री राजा नल के प्रतापी चरित्र का जानेंगे।

CO5-त्रिविक्रमभट्ट द्वारा वर्णित नल एवं दमयंती की प्रणयकथा का चमत्कारी वर्णन को जानेंगे।

एम. ए. 4 Sem प्रश्न पत्र - 4

प्रश्नपत्र का शीर्षक - विशेष कवि।

CO1-छात्र विशिष्ट कवियों (कालिदास , भवभूति)आदि के जीवन से एवं उनकी कृतियों में दिए संदेशों से प्रेरणा लेंगे।

CO2-दुष्यंत शकुन्तला ऋषि कण्व के जीवन से छात्र प्रेरणा लेंगे।एवं अपने जीवन को दुष्यंत एवं शकुन्तला जैसा तपस्वी बनाएंगे

CO3-मालविका एवं अग्निमित्र के प्रेम एवं विवाह को जानेंगे। साथ ही राजमहलों में होने वाले षड्यंत्रों से भी परिचित होंगे।

CO4-विक्रम एवं उर्वशी के प्रेम कथानक से परिचित होंगे। साथ ही नाटक कौशल में प्रवीण होंगे

DEPARTMENT OF HISTORY

Programme Outcomes, Programme Specific Outcomes and Course Outcomes

BA (History)

Programme Outcomes

Programme Outcomes may be listed as follows:

- **Sound Knowledge of different Historical Periods:** Under the BA papers in each year are devoted to the study of particular Historical phase in the historical in the events along with the study of a few major works by some master Historians of that period. These not only help the students to understand a historical period better, but also reduce the load of study in the concerned area.
- **Knowledge of the Development of Historical Perspective:** While pursing BA Programme of studies in History it is mandatory that a student develops proper knowledge of the historical events. In this sphere also the present syllabus appears to be illuminating, as it's provides the students with standard and up to date knowledge of historical events, impact, war and history, result. The students may acquire knowledge of the historical events of the Ancient, Medieval, Modern and European history in new aspects.
- **Development of the Historical Perspectives**: The current syllabus is well chosen to represent different events from different angles. They are not only meant to make the students familiar with the dominant events of different ages, but also to open out new perspectives, the student may acquire a knowledge of the changing nature of politics or kingdoms of the changing times

Programme Specific Outcomes

On completion of BA with History, students will be able to-

- Understand the basic themes, concepts, chronology and the Scope of Indian History.
- Acquaint with range of issues related to Indian History that span distinct eras.
- Understand the history of countries other than India with comparative approach.
- Think and argue historically and critically in writing and discussion.
- Prepare for various types of Competitive Examinations 6. Critically recognize the Social, Political, Economic and Cultural aspects of History

Outcomes

B.A. First Year (History, Major)

Course Title : -(Paper I) "Idea of Bharat"

Course Outcomes: Students would be able to

- Learn about concept of BHARAT VARSH.
- Know about Indian concept of time and space.
- Understand concept of history.
- Understand Indian historical views, scope of history
- Know about Archiological sources of history.
- Understand Indian education system .

Course Title : - (Paper II) History of India (From Earliest time to 1205 A.D)

Course Outcomes: Students would be able to:

- Perceive various sources to study of Ancient India.
- Know about the development and the achievements of man in the Stone Age.
- Understand physical and geographical structure of India.
- Identify Palaeolithic and Neolithic settlements.
- Understand the glory of Indian history in the age of Harappan civilization.
- Understand the philosophy of Jainism and Buddhism.
- Know about the Mauryan and Gupta Empire.
- Understand the history of Satvahanas, Shungas, Kushans, and Hunas.

B.A. Second Year

History : Major
First Paper : (History of medieval India from 1206 – 1739 AD)

After studying this paper, student will be able to present clear cut Ideas about Delhi sultante and contemporary Indian rulers. They will be able to give on analytical view of various dynasties.

History – Minor/Elective
Second Paper : (History of modern India from 1740 – 1947 A.D)

In this paper, student learn about colonial administration with all its salient features need the relations between the British and the Indian states. They will also learn about all the treaties that the kings of India were forced to make with the British. They also able to conduct adiscutssion the role women in India During the British time.

B.A. Third Year (History)

Course Title: (Paper I) Modern History of India (1740 to 1857 A.D.)

Course Outcomes: On the completion of course, students will able to...

- Identify the importance and the legacy of freedom movement.
- Distinguish the detail account of British Raj as well as its overall impacts on the Indian Society.
- Evaluate the renaissance and social reform movement in India.
- Understand some of the early resistance to British Raj.

Course Title: (Paper II) Modern History of India (1858 to 1950 A.D.)

Course Outcomes: On the completion of course, students will able to...

- Understand the early political awakening in India Freedom Struggle.
- Identify the social institution of late 19^{th} century.
- Understand various phases of the national movement and the difference between moderates, extremists and the revolutionaries.
- Comprehend the socio-religious scenario and the social reformation.
- Grasp the detail of freedom movement under the Mahatma Gandhiji leadership.
- Understand the evolutionary processes of constitutional development.

Master of Arts (MA) in History

Programme Outcomes:

- The students acquire in depth knowledge in the field of social sciences, literature and humanities which make them sensitive and sensible enough to solve the issues related with mankind.
- The postgraduates will be acquainted with the social, economical, historical, geographical, political, ideological and philosophical tradition and thinking of their respective subjects.
- The program also empowers the post-graduates to appear for various competitive examinations or choose the any post graduate or research programme of their choice.
- The M. A. program enables the students to acquire the knowledge with human values framing the base to deal with various problems in life with courage and humanity.
- The students will be ignited enough through the knowledge of the special PG programme to think and act over for the solution of various issues prevailed in the human life to make this world better than ever.

- Through the PG programme the students will come know about research in their respective subject. It may also provide the information to the students for collection of Data, enquiry, primary and secondary methods of collection of data, classification and tabulation of data. Students get knowledge of various research methods and can realize the importance of research to find solutions of a specific issue.

Programme Specific Outcomes:

- We can say that History has surrounded us and waits for the right time to explode.
- It never lets one to forget past easily.
- Present has its own need and facilities. Some try to forget History where as some we History as per their necessity.
- All the sage and saints through their saying portray history is very good. It means that everyone is utilizing history according to their perspective only thing is we don't realize it as it is past and parcel of our life.
- When it becomes violent and aggressive, then we realize that past is still alive and exists. None of the countries can history of its own and make a new beginning. In this way, History always is alive giving a direction to presents hence history cannot be considered as only a syllabus to study.
- Countries may be ruled or became independent anytime but the feeling of patriotism remains in the hearts of the people.
- History provors people about going independence whenever they are ruled by.
- One historical truth is past condition creating present and it can giving new birth to future and so it is important to remind it.
- Students can avail good opportunities to work in the field of archeology, education and research.

DEPARTMENT OF POLITICAL SCIENCE

NEP 2020

Bachelor of Arts [BA] (Sociology)

B.A. (SOCIOLOGY) OUTCOME /PSO/CO

Program Outcomes Program Outcome for Undergraduate Programs (B.A) Sociology

Learning outcomes for the Sociology Under-graduate Program**.**

 Student will demonstrate knowledge of core sociology concepts.

 Student will demonstrate knowledge of how to use theory to conceptualize a sociological problem.

 Student will demonstrate the ability to communicate sociological knowledge to others.

 Student will develop an ability to use social scientific research methods to address sociological questions.

 Student will develop the knowledge, skill and attitude necessary to be engaged member of the community.

 Student will possess analytical skills in areas such as policy analysis, administration analysis and problem solving

Programme Specific Outcome ***(PSO):-***

The major in sociology is intended to serve as preparation for careers in teaching, delivery and administration of social and health services, urban and environmental studies, law, government service at local, state and federal levels and related occupations.

The major also provides training for advanced graduate work in sociology, social work and other social sciences.

Sociology is also recommended as a second major or minor for students of all other social sciences; for business; for the humanities; especially literature and theatre arts; for ethnic and area studies; for journalism and other various applied arts and sciences.

Course Outcome (*CO):-*

Students would be able to gain knowledge about the emergence and development of Sociology and the pioneers of the subject like Auguste Compte, Karl Marx, Emile Durkheim, Max Weber, Vilfredo Pareto etc. and some of their important classical theories along with the development of sociological thoughts in India.

BA Sociology is one such course that will pave your path for entering the world of business, industry, and organizations. You may also seek a job in various government departments.

Also, most of the BA Sociology students go on to pursue an BA Sociology. Some students also go for a course in Mass Communication.

You will also get multiple other career options to choose from. You may apply for the post of Counsellor, Lecturer, Community Service officer, Teacher, Social Researcher, Welfare Rights Adviser, and many more. Some of the most popular work areas have been mentioned below:

The following learning goals and objectives apply to these areas of study. Corporate research, Human resources & Management etc.

B.A. Ist YEAR (SOCIOLOGY) major

TITLE- Indian Society and culture (PAPER-1)

Sociology students are required to take two "core" courses in the areas of Social Inequality and Social Change and Global Perspectives in the major.

 The mandate of the course is to introduce the society and culture of India.

 This paper is expected to bring familiarity in a student about Indian Society

 It will present a comprehensive, integrated and empirically – based profile of Indian society.

 This paper focuses on the culture, personality, joint family, Varna system, Vaste system & Panchayti Raj.

B.A. Ist YEAR (SOCIOLOGY) Major II/ Minor

TITLE-Basic Concept in Sociology (Major II/ Minor) (PAPER-2)

The course is intended to introduce the student to a sociological way of thinking. It provides an understanding of the discipline of sociology and sociology perspective student will be able to –

 Define sociology and demonstrate nature, scope and subject – matter, relationship with other social science.

 Acquaint themselves with the basic concept of sociology like society, community, association, institution, social structure, culture, status & role, Norms & values.

 Explain social groups.

 Know the basic social institution like family, Economy, Polity kinship and religion.

B.A. Ist YEAR (SOCIOLOGY)

TITLE - Introduction of Sociology (CC-01) (PAPER-3)

Optional Paper, Elective* Paper (GE) *Learning Outcomes-

 Student will be able to explain social facts and society relates concepts.

 Student will be able to define and explain social concepts, social facts and student will be able to express empirical observations with sociology concepts.

 Student will be able to define and explain main characteristics of social institutions.

 Student will be able to convey the historical development of sociology**.**

 It also provides a foundation for the other more derailed and specialized course in sociology.

B.A. IInd YEAR (SOCIOLOGY)

B.A. IInd YEAR (SOCIOLOGY) (PAPER-1) Course/Paper Code-A2SOCI 1T

***TITLE - Basic Concepts of Social Research* (Major- I)**

Programme Specific Outcome ***(PSO):-***

Apply social scientific principles to understand the social world. Articulate the effective use of evidence; generate research questions and/or hypothesis based on social research. Identify the limits of the scientific method in understanding social behavior and processes.

 To understand the nature of social phenomena and the issues involved in Social research.

 Study of research methods as a means of understanding social reality

 Exposure to the fundamental of various research techniques and report writing

Learn the methods of data collection, analysis and report writing

 Acquaintance with the Quantitative and Qualitativestrategies of research

 Evaluate the quality of social scientific data. Identify the characteristics of high quality data in sociological research, and evaluate multiple representations of data in public discourse.

 Rigorously analyze social scientific data. Demonstrate the ability to understand, interpret, and analyze qualitative and quantitative data.

 Communicate in a clear and coherent manner in both written and oral communication. Convey sociological concepts and understandings to a broader audience.

Use sociological knowledge to inform public understanding and policy debates. Use sociological knowledge, skills, and theories to engage with the world around them, and to promote social just.

• Students will practice writing informed consents, and they will analyze research designs that violate and those that adhere to the standards of ethical research.

• Students will understand the logic of content analysis and case study.

• Students can define the processes of social scientific research. and limitations of the various methodologies used in the social sciences.

• Students can identify various modes of design for data collection. Students can determine the difference between primary and secondary sources, distinguish between reliable and unreliable information, and can interpret data tables, figures and graphs accurately.

• Students will be able to describe and apply the steps of the scientific method develop research hypotheses, gather data, analyze data, and provide an answer to the research question.

• Students will understand the logic of probability sampling and they will be able to do the application of data generated through Sampling.

• Students will be able to design a research project using the best mode of observation to answer a specific research question.

• Students will be able to analyze qualitative and quantitative data.

B.A. IInd YEAR (SOCIOLOGY) (PAPER-2)

Course/Paper Code-A2SOCI 2T

***TITLE* - Social Change and Development (Major- II / Minor)**

Programme Specific Outcome *(PSO):-*

Social change is inevitable, hence learning about human society is incomplete without comprehension of change. This paper is designed to give the student an extensive knowledge about social change and it's overall impact on society.

- This paper will introduce the students with the concept, various factors, process and theories of social change.
- It will also give them knowledge about the concept of development and its consequence.
- The critical contribution would enable students to come out with understanding of policies and initiatives taken by the government, there impleyementation and resulting problems.
- Students will versed with this course are most likely to get job opportunities in various departments of Planning and development, in NGOs which work as agencies of change and development and Research Institutes which deal with project and planning.

 The mandate of the course is to introduce the society and culture of Social processes.

 This paper is expected to bring familiarity in a student about Social processes

 It will present a comprehensive, integrated and empirically – based profile of Social processes.

 This paper focuses on the culture, personality, joint family, Varna system, Vaste system & Panchayti Raj**.**

 Explain the meaning and types of social change.

 Describe the forms of social changes.

 Explain linear, Cyclical, Demographic theories.

 Understand the process of social change.

 Explain human development, social development sustainable development.

 Describe capitalist, mixed economy, NGO.

• Students will demonstrate an understanding of sociological concept and theories of social change.

• Students will demonstrate an understanding of the role of modernization, westernization, secularization and globalization in social change.

• Students will know socio economic policies and Indian experiences of development

B.A. IInd YEAR (SOCIOLOGY)

Course/ Paper Code-A2SOCI 1G

TITLE - Sociology of Tourism, Optional Paper, Elective **Paper (GE)**

Programme Specific Outcome ***(PSO):-***

After studying this course, students will be aware of the concepts of sociology of tourism:

 Able to analyze the national and Global Impact of tourism.

 Students will be able to understand the imprortance of tourism culture of the country.

 Students will get a change to understand the social and cultural image of India.

 This course will give an opportunity to the students to understand the intercultural values.

 Students will learn about Indian heritage and will also realize the need of conservation.

 Students will have the opportunity to understand the different types and functions of tourism organization at the international, National, Regional and local levels.
 Students will get employment opportunities in different development dealing with various aspect of Tourism.

1: Context of Tourism:-
Contextualize tourism within broader cultural, environmental, political and economic dimensions of society.
Critique tourism practices for their implications locally and globally.

2: Knowledge of Tourism:-
Interpret and evaluate tourism as a phenomenon and as a business system.
Explain the diverse nature of tourism, including culture and place, global/local perspectives, and experience design and provision.

Identify and assess relationships and networks relative to building tourism capacity.

3: Professional Skills:-
Apply relevant technology for the production and management of tourism experiences.
Plan, lead, organize and control resources for effective and efficient tourism operations.
Create, apply, and evaluate marketing strategies for tourism destinations and organizations.
Develop and evaluate tourism policy and planning initiatives.

4: Ethics and Values:-
Demonstrate commitment to ethical practices of tourism.
Actively engage in the world as global citizens.
Practice empathy and respect for diversity and multicultural perspectives.
Apply principles of sustainability to the practice of tourism in the local and global context.

5: Research:-
Acknowledge one or more philosophical perspectives to knowledge creation.
Evaluate and apply various research methods commonly used in the context of tourism.
Propose and conduct a research project to inform tourism practice.

6: Communication:-

Select and deploy task-appropriate forms of oral, written, digital, and graphic communication.
Value and practice active listening, critical thinking, and critical reading.
Distinguish and produce forms of communication relevant to academia, business, government, and industry.
Assess, evaluate, and employ appropriate communication tools for discussions within and between teams and members, various audiences, decision-making teams, and corporate communication tasks.

7: Critical Thinking & Problem Solving:-
Apply problem solving and critical analysis within diverse contexts.

8: Leadership & Teamwork:-
Work collaboratively in groups, both as a leader and a team member, in diverse environments, learning from and contributing to the learning of others.

OLD

B.A. IIIrd YEAR (SOCIOLOGY)

TITLE - Sociological Thinkers (PAPER-1)

Programme Specific Outcome *(PSO):-*

 Define sociological theory, understand its features and describe and illustrate the role of theory in building sociological knowledge.

 Introduce themselves to the classical theories of Sociology and contributions of different thinkers in this regard.

 Know the contributions of founding fathers of Sociology in developing sociology as an academic discipline.

B.A. IIIrd YEAR (SOCIOLOGY)

TITLE – Method of Social Research (PAPER-2)

Apply social scientific principles to understand the social world. Articulate the effective use of evidence; generate research questions and/or hypothesis based on social research. Identify the limits of the scientific method in understanding social behavior and processes.

 Evaluate the quality of social scientific data. Identify the characteristics of high quality data in sociological research, and evaluate multiple representations of data in public discourse.

 Rigorously analyze social scientific data. Demonstrate the ability to understand, interpret, and analyze qualitative and quantitative data.

 Communicate in a clear and coherent manner in both written and oral communication. Convey sociological concepts and understandings to a broader audience.

 Use sociological knowledge to inform public understanding and policy debates. Use sociological knowledge, skills, and theories to engage with the world around them, and to promote social just.

M.A. Semester I

Course Title: Paper I-Modern Indian Political Thought

Course Outcomes:

- The purpose of this paper is to develop an understanding about the specificities of Indian political thought.
- Students have learnt about the thought processes developed during the interaction with and struggle against the colonial regime.
- This period spans from mid 18th century to mid 20th century.
- The main thinkers abourt which students have lesrnt are Raja ram Mohan roy, Bal Gangadhar Tilak, Swami Vivekanand, Mahatma Gandhi, Sayyid Ahmad Khan, Jay Prakash Narayan, J.L.Nehru, Ram Manohar Lohia and others.

Course Title: Paper II- Comparative Politics

Course Outcomes:

- This paper aims at the development of an understanding of the theoretical aspect of comparative politics.
- Students have learnt to compare between various political and social formations .This paper has also developed an understanding of the parameters of comparison.
- The main approaches which a students have learnt are, institutional approach, political system approach, structural functional approach, political economy approach and neo-institutional approach. The theoretical bases of analysis taught are state, class, Caste, elites, gender and race.
- A theory of development, political culture, political communication, political recruitment and political participation has also been taught.

Course Title: Paper III- International Political Theory

Course Outcomes:

- This papers aims at the development of understanding of the theoretical aspect of international politics. Concepts which are taught are, balance of power, and collective Security; Imperialism, Colonialism, New Colonialism and War' National interest and International Ideology, morality etc.
- The concept of non-alignment, disarmament CTBT and cold war has also been developed. Other concepts such as North-South dialogue, South-South dialogue, NAFTA and globalization has also been developed.

Course Title: Paper IV- Public Administratio

Course Outcomes:

- This paper aims at the development of an understanding of the concepts and issues of public administration, Students have learnt about the various phases of the development of meaning, nature and scope of public administration.
- They have also learnt about the various approaches such as liberal democratic, welfarist and Marxist approaches of Public administration.
- The course has also developed an understanding about financial administration and the nature of civil service and bureaucracy.

M.A. Semester II (Political Science)

Course Title: Paper I- **Political Thinkers Part I**

Course Outcomes:

- This papers aims at developing an understanding of the history of political thought among the students.
- Students have learnt the political thinkers ranging from Plato and Aristotle from Greek Political thought, Kautilya and Confucius from Asia in ancient period.
- They have also developed understanding about medieval Christian political thinkers such as Thomas Augustine, Thomas Aquinas and the modern political thinkers such as Machiavelli, Thomas Hobbes and John Locke.
- They have also learnt as to how they can have a critical understanding of the political thinkers.
- Addition to it they have an idea about the methodologies used by classical political thinkers**.**

Course Title: Paper II- Politics of South Asian Countries (Pakistan, Bangaladeso Srilanka, Nepal)

Course Outcomes: This paper aims at providing an understanding of the politics of neighbouring countries, Pakistan, Sri Lanka, Bangla Desh and Nepal.

- Over the years they have developed ideas about the socio-economic conditions and the political development in post 1970s.
- They have also learnt the constitutional framework of these countries. In additions to it they have learnt about the main issues which influence the politics of these countries.

Course Title: Paper III- International Organisation

Course Outcomes:

- This paper develops an idea about the understanding the structure and functioning of international organizations.
- This includes world level organization United Nations Organisation, and regional organizations such as European Union, SAARC, ASEAN, APAC, OAS, and BRICS.
- Students have also learnt about economic organization like WTO and World Bank.

Course Title: Paper III- Research methodology

Course Outcomes:

- This paper aims at the development of understanding of methodological aspect of research in political science.
- Students studying this paper have learnt about the nature of research methods used in social science.
- This includes the study of research method and hypothesis. They also study about the survey techniques and methods of data collection. In addition to it they have also learnt about the methods of report writings

M.A. Semester III (Political Science)

Course Title: Paper I- Modern Political Thinkers

Course Outcomes:

- The purpose of this paper is to develop the understanding about the thought processes starting from the period of French Enlightenment.
- Students will learn about the political thoughts of J.J. Rousseau, Montesquieu of Enlightement period, utilitatians such as Bentham and J.S. Mill, idealists such as Hegel and Green, and the thought of Karl Marx.
- They will also develop understanding about Twentieth century thinkers such as Berlin, Hannah Arendt, Eric Voegelin and John Dewey.

Course Title: Paper II- **Indian Government & Politics**

Course Outcomes:

- This paper aims at developing an understanding about the political processes in India.

- In course of learning these processes students learn about the functioning of government based on Indian constitution.
- This includes the study of preamble of Indian constitution and the fundamental rights and directive principles for state policies.
- They also learn about the values enshrined in Indian constitution such as secularism, socialism and pluralism.
- In addition it this paper has also made them acquainted about the important debates and court cases related to them.

Course Title: Paper III- International Law and Human Rights

Course Outcomes

- This paper is a discussion about the international law and the protection of human rights. Students have learnt about evolution and development of international law in the human history.
- They have learnt about law of neutrality.
- Rights and duties, violation of international law of air and Geneva Convention. They also get informed about the international covenants.

Course Title: Paper IV Indian Foreign Policy

Course Outcomes

- This paper is a discussion about the developments in Indian foreign policy.
- Students have learnt about the external and internal determinants of Indian foreign policy.
- They also have an idea about the foreign policy with reference to India's relations with super powers United States of America and Russia, with neighbours, Bangla Desh, Sri Lanka and Pakistan. In addition to it they have an idea about the India and United nations.

M.A. Semester IV (Political Science)

Course Title: Paper I: Advance Political Theory

Course Outcomes

- This paper is aimed at developing an understanding about the recent trends in advanced political theory.
- Students learn about the nature and scope of political theory.
- In so doing they know about the debates of political theory such as decline and resurgence of political theory and end of history debate.
- They also know about the various theories of democracy such as Athenian democracy, republican democracy elitist theory of democracy and deliberative democracy.

- They also get acquainted with various ideologies such as Marxism, liberalism, socialism, feminism, anarchism, multiculturalism and environmentalism.

Course Title: Paper II- Indian Political Processes

Course Outcomes

- This paper aims at providing the knowledge of actual functioning of Indian state and constitution on the one hand and the social and non –political processes on the other.
- Students have learnt about the various interpretations and theorizations of Indian state.
- It has also provided the political analysis of the Indian planning process. They also have an idea of the challenges to Indian political system such as castiesm, regionalism under gender differences.
- In addition to it they have idea about the Indian system of democratic decentralization i.e. panchayats and nagarpalikas

Course Title: Paper III State Politics in India

Course Outcomes

- This paper develops an understanding of the state politics in India with special focus on Madhya Pradesh.
- Students have learnt about the re-organisation of Indian state after independence.
- An understanding of determinants of politics is also developed. They have developed an idea about the executive and legislative processes of the state.
- In addition to it they also learn about the challenges faced by the Indian state by the specific forms of politics in the state such as interstate water distribution disputes and state autonomy.
- They also learn about the interstate council state planning commission.

Course Title: Paper IV- Diplomacy- Theory and practice

Course Outcomes

- This paper aims at providing an idea of diplomatic behavior of states. Students learn about the historical development of theory and practice of diplomacy.
- They learn the various types of diplomacy. Further they have developed understanding about the functioning of diplomats in different countries.

An idea about the foreign policy and its relationships with diplomacy is also developed.

DEPARTMENT OF ECONOMICS

Program Outcomes

Bachelor of Arts (B.A.)

NEP 2020

B.A. 1st Year Economics Paper I Course / Paper Code A1-ECON1T

Title : Micro Economics Paper 1

Course learning outcomes :- After completing this course,

1 students will be able to understand rational behaviour and fundamentals of microeconomics.

2 They will be able to explain consumer's and producer's behaviour and their optimum decisions.Students will be able to know about the firms and industry, markets and their decisions about optimum production.

3 They will be also able to explain the theory of distribution and concept of economic welfare.

4 Learning microeconomics iS an excellent way to gain an understanding of many factors that affect us in the real-world, such as methods of buying goods, product pricing and input pricing.

5 Ultimately, learning microeconomics is key in learning about the principles of economics.

NEP 2020

B.A. I Year

B.A. 1st Year Economics Paper II Course / Paper Code A1-ECON2T
Title : Indian Economy Paper 2
Course learning outcomes :- After completing this course,

1 students will be able to sharpen the analytical skills by highlighting on broad overview of the Indian economy.

2 They will be familiar with the issues related to Agriculture, Industry, Foreign Trade, Economic Planning and various Economic Problems of India.

3 Students will be acquainted with broad overview of Madhya Pradesh Economy.

4 They will be able to develop, analyse and interpret events and issues related to Indian Economy.

NEP 2020

B.A 1 YEAR ECONOMICS Course Type Elective

B.A. 1st Year Economics Paper I Course / Paper Code A1-ECON2G

Title : Indian Economy – An Introduction

Course learning outcomes :- After completing this course,

1 students will be able to understand the basic concepts of the Indian economy.

2 They will be familiar with the issues related to Agriculture, Industry, Foreign Trade, Economic Planning and Various Economic Problems of India.

3 They will also be able to understand the various issues of Madhya Pradesh Economy.

NEP 2020

B.A. II Year

B.A. 2nd Year Economics Paper I Cource / Paper Code A2-ECONIT

Title : MACRO ECONOMICS Major 1

Course learning outcomes :- after completing this course -

1. Students will be able to explain the difference between macro economics and micro economics ,common macro economic variables, national income and determination of output and employment in classical and Keynesian. approaches.
2. They will be able to understand the consumption and investment functions of an economy and to drive IS-LM curves and use the framework to explain the working of an economy.
3. Student will also be able to explain the concept,measurements and effects of inflation, deflation and the various theories of trade cycle.

B.A. II Year

B.A. 2nd Year Economics Paper I Cource / Paper Code A2-ECONIT

Title : MACRO ECONOMICS Major 1

Course learning outcomes :- after completing this course -

1. Students will be able to explain the difference between macro economics and micro economics ,common macro economic variables, national income and determination of output and employment in classical and Keynesian. approaches.
2. They will be able to understand the consumption and investment functions of an economy and to drive IS-LM curves and use the framework to explain the working of an economy.
3. Student will also be able to explain the concept,measurements and effects of inflation, deflation and the various theories of trade cycle.

B.A. III Year

Course Title: (Paper I) Development and Environmental Economics

Course Outcomes: On the completion of course, students will able to...

- Explain the concept of economic growth and can explain inequalities between rich and poor countries, how the differences have evolved over time and how other measurements of quality of life correlates with per capita income.
- Understand the role of economic theory in solving various problems related to economic development.
- Get the knowledge and skills to critically evaluate economic problems of developing countries.
- Understand the various economic theories in the context of India development perspectives.
- Understand the concept of inclusive growth and sustainable development with reference to the environmental resource problems,

Course Title: (Paper II) Statistic

Course Outcomes: On the completion of course, students will able to...

- Understand the statistics and different techniques of data collection and its presentation through Tabulation and Graphic Representation.
- Understand the various methods of measuring central tendency, Dispersion, Coefficient of Variation, and Quartile Deviation.
- Understand the procedure of solving the correlation and regression and its application.
- Understand the preparation of time series and index numbers. It will enhance the computational skill of Estimating the time series and trend analysis. Enabling them to computes the cost of living index and Solves the Paasche'S, Laspeyre'S, Fisher'S Index numbers
- Understand the concept and rules of Probability. They will be able to understand and apply the concepts of research methodology and research report writing.

M.A. Economics (2 Years Programme)

Programme Specific Outcomes:

- To impart in depth knowledge to students about economic theory regarding utilization and allocation of resources including labour, natural resources and capital.
- To develop students understanding about how market for goods and services function and how income is generated and distributed.
- To give students in depth knowledge into special fields of choice like agricultural economics, industrial economics, financial market, development economics, international trade, urban economics econometrics, mathematical economics etc.
- To make students familiar with economic theories and their relevance, econometrics, quantitative techniques and applied research in a wide variety of fields within economics.

- Students would know how the economy is influenced by economic policy, technological advances and demographic conditions

M.A. I-Semester (Economic)

Course Title: (Paper I) Micro Economic Analysis-I

Course Outcomes: On the completion of course, students will be able to...

- Familiar students on creating an understanding among students on the basic reasoning of Economics.
- Understand various economic issues and applied part of the economics.
- Do marginal analysis an approach to price and output determination in various market.
- Demonstrate knowledge of laws of supply and demand and equilibrium.
- Get a comprehensive knowledge of Micro Economics will empower students to explain the social reality with better arguments and optimum solutions.

Course Title: (Paper II) Macro Economic Analysis-I

Course Outcomes: On the completion of course, students will able to...

- Explain the concept of opportunity costs, trade –off and benefits of economics.
- Explain the concept of circular flow of income in economy.
- Learn the concept of fiscal and monetary policies and their effect on economy.
- Be familiar about a clear picture of circular flow model.
- Be familiar about classical approach to demand for money.

Course Title: (Paper III) Quantitative Techniques

Course Outcomes: On the completion of course, students will able to...

- Learn the importance and scope of statistics.
- Calculate the equilibrium prices, impact of tax and subsidy on demand and supply.
- Gain knowledge to simple differentiation and its applications in economics.
- Gain knowledge to Interpolation, extrapolation and index numbers.
- Learn the measurement of central tendency, analysis of variance and multiple regression and correlation analysis.

Course Title: (Paper IV) Economics of Growth and Development -I

Course Outcomes: On the completion of course, students will able to...

- Acquaint with the various perspectives of economic growth and its relevance.
- Become familiar with factors affecting economic growth and development.
- Understand the conceptual bases of income measurement, physical quality of life index, poverty, inequality and development gap and role of various institutions in economic growth and development.

- Get knowledge about the nature and classical theories of development. Students would be able to apply economic theories and concepts to contemporary social issues, as well as formulation and analysis of policy and recognize the role of ethical values in economic decisions.

M.A. II-Semester (Economic)

Course Title: (Paper I) Micro Economic Analysis-II

Course Outcomes: On the completion of course, students will able to...

- Understand Distribution new classical theory.
- Do marginal analysis an approach to price and output determination in various market.
- Demonstrate knowledge of laws of supply and demand and equilibrium.
- Behave individually towards risk, expected utility etc.

Course Title: (Paper II) Macro Economic Analysis-I

Course Outcomes: On the completion of this course, students will able to...

- Explain the concept of opportunity costs, trade –off and benefits of economics.
- Explain the concept of circular flow of income in economy.
- Learn the concept of fiscal and monetary policies and their effect on economy.
- Be familiar about a clear picture of circular flow model.
- Be familiar about classical approach to demand for money.

Course Title: (Paper III) Quantitative Techniques

Course Outcomes: On the completion of this course:

- Students would learn the importance and scope of statistics.
- Students would be able to calculation of equilibrium prices, impact of tax and subsidy on demand and supply.
- Students would gain knowledge to simple differentiation and its applications in economics.
- Students would gain knowledge to Interpolation, extrapolation and index numbers.
- Students would learn the measurement of central tendency, analysis of variance and multiple regression and correlation analysis.

Course Title: (Paper IV) Economics of Growth and Development -I

Course Outcomes: On the completion of course, students will able to...

- Acquaint with the various perspectives of economic growth and its relevance.
- Become familiar with factors affecting economic growth and development.

- Understand the conceptual bases of income measurement, physical quality of life index, poverty, inequality and development gap and role of various institutions in economic growth and development.
- Get knowledge about the nature and classical theories of development. Students would be able to apply economic theories and concepts to contemporary social issues, as well as formulation and analysis of policy and recognize the role of ethical values in economic decisions.

M.A III semester Economics

Course Title: (Paper I) Public Economic

Course Outcomes:

- The students would learn of the feature the federal structure and financial relationship among them.
- The course would develop the analytical ability of students to distinguish between beneficial and detrimental effects of a government policy and their effect on macroeconomics framework of an economy.
- It will help students to critically analyse the fiscal reforms and policy choices of the government in developed and developing countries.

Course Title: (Paper II) International Economics

Course Outcomes:

- Students would know about Interregional and international trade, different theory of international tread.
- Students would know the country's position regarding international trade, payments and foreign exchange.
- The students would learn the methods regarding improvement in terms of trade, international debt and balance of payments positions.
- Students would know about the policies regarding increase in exports and to deal with international institution.

Course Title: (Paper III) Labor economics

Course Outcomes:

- Student would Know About nature and characteristics of labour market in developing countries.
- Students would become familiar labor market policy, rationalization, methods of recruitment and placement and employment service organization in India.

- Students would know how wages are determined within different models for wage bargaining and models for efficiency wages.
- Students would understand employment and development relationship in developing countries.

Course Title: (Paper IV) Agricultural Economics

Course Outcomes:

- Course provides knowledge agricultural background, rural economy, farm and agro business activities.
- Course provides knowledge livestock economics, rural infrastructure development and Agricultural Production.
- It introduces learner applied part of economics instead theoretical, which deals with allocation of land under various crops, specialization, diversification and other policy amplifications.
- Course offer relevant production and various techniques to understand agri production, cost benefit analysis and enhance learner to make frontier-production function at least cost.

M.A. IV-Semester (Economic)

Course Title: (Paper I) Indian Economic Policy and issues

Course Outcomes:

- To have knowledge about the issues in Indian Economy like planning, poverty, unemployment agricultural production etc.
- To know about relationship between monetary policy, fiscal policy and economic development.
- To know about framework of policy making for the development of Indian economy
- To know about foreign trade and balance of payment, international institutions, multinational corporation and foreign capital.

Course Title: (Paper II) Demography

Course Outcomes:

- Gain a sound command over the basic tenets of demography as well as key demographic issues and illustrations in the context of a large and diverse country like India.
- Grasp a clear understanding of the inter-relationship between demography and the process of economic development
- Comprehend the basic components of population (fertility, mortality, migration)
- To study established theories of population To explore various aspects of the population policy and to study its impact on socio economic issues

DEPARTMENT OF GEOGRAPHY

Programme Outcomes, Programme Specific Outcomes and Course Outcomes

BA (GEOGRAPHY)

Programme Outcomes:

- Student will gain the knowledge of physical geography. Student will have a general
- Understanding about the geomorphological and geotechnical process and formation.
- They will be able to correlate the knowledge of physical geography with the human geography.

Course Outcomes

BA First Year

Course Title : - Major (Paper I) Physical Geography

Course Outcomes:

Students would be able:

- To explore the fundamental concepts of the atmosphere, oceans and the Earth surface.
- To familiarize the students with the basic map making and reading techniques.
- To make them understand various aspects of human geography especially races religion, cultural regions and population.
- To make the students aware of the theoretical aspects of regional development and planning.
- To give the students general view and importance of man and environment Relationship.
- To equip the students with basic understanding of the satellite science and are alphotogrammetry.
- To make the students aware about the physiographic divisions and economic Resources of India.
- To refrain the theoretical knowledge of students of “what, where and why” in Geography through field survey.
- To make them understand various problems and overcome them through proper management, planning and sustainability.
- To motivate students to understand the disaster risk and to take actions appropriately against such risk with their own will.

Course Title: Minor (Paper II) Human Geography

Course Outcomes:

Students would be able:

- To make them understand various aspects of human geography especially races, religion, cultural regions and population.

- To give the students general view and importance of man and environment relationship,
- To further the understanding of the students so as to achieve the conceptual clarity of various aspects related to humans.
- Students will demonstrate a proficiency in knowledge of essential concepts of physical and human geography including nature-society interactions as well as global human and environmental issues.

Course Title: - Practical

Course Outcomes:

Students would be able to:

- Develop an idea about scale and draw different types of scale like linear, diagonal and vernier.
- Gain knowledge about topographical maps and apply this knowledge in ground surface.

B. A. Second Year

Course title : - Major(Paper I) Economic Geography

Course Outcome:

Students would be able to:

CO 1. Explain the role of historical, enviromental, cultural and other factors responsible for the location and distribution of economic activities.
CO 2. Establish and analyze spatial pattern of economic development.
CO 3. Examine man's economic activities in light of his environment.
CO 4. Learn about the selected industries of Madhya Pradesh.

Course title : - Minor(Paper II) Physical Geography (Atmosphere & Climatology)

Course Outcome:

Students would be able to:

CO 1. Appreciate the elements of Weather and Climate and its impact at different scales.
CO 2. Learn about the knowledge of Weather and Climate Available in Ancient Indian Literature.
CO 3. Learn about the climatic regions of the world and their basis.
CO 4. Comprehend the climatic aspects and its bearing on the planet earth.

Course title : - Practical (I)
Themtic Mapping

Course Outcome:

Students would be able to:

CO1. prepare Thenatic maps by using Cartographic Techniques.
CO2. Comprehend the utility and construction of projection essential for map making.
CO3. Gain in-depth knowledge of Prismatic Compass Survey.

Course title : - Practical (II)
Weather Maps and Symbols

Course Outcome:

Students would be able to:

COP 1. Correlate theoretical knowledge about Weather and Climate with its practical aspects.
COP 2. Analyze the Indian weather maps and learn about weather forecast.
COP 3. Respresent the climatic data through maps, graphs and diagrams.

B.A. Third Year

Course Title: (Paper I) Geography of India

Course Outcomes: Students would be able to:

- Introduce the students to the physiographic divisions of India, drainage system, climate, food and mineral resources.
- Get familiarized with the geographic dimensions of India in terms of its regional vitality and formation of regions.
- Get in-depth knowledge of climate, natural vegetation, agriculture and energy resources and industries of India.

Course Title : - (Paper II) Environment & Resource

Course Outcomes: Students would be able to:

- Make the students understand the key concepts of cause and effect and how they relate to influence the human activities and climate in shaping the Earth surface.
- Assess the nature, impact and management of major natural and man-made hazards affecting the Indian subcontinent.
- Gain knowledge about concept, scope of environmental geography and components of environment.
- Develop an idea about human-environment relationships.
- Build an idea about ecosystem.

- Know about environmental programmes and policies.

M.A. GEOGRAPHY I SEM

PROGRAMME NAME: TWO YEARS M. A. IN GEOGRAPHY & APPLIED GEOGRAPHY

PROGRAMME OUTCOMES

- Instill confidence and develop a sense of identity in facing the real world.
- Foster cooperation among students enabling them to connect and contribute towards teamwork activities.
- Develop effective communications skills that promote leadership qualities individually as well as within a group.
- Develop critical thinking and skills that train students to analyze problems and validate real life solutions.
- Prepare objective scientific approach so that students can address research problems in Applied Geography and allied fields.
- Strive towards making enlightened citizens with commitment and empathy to social concerns.
- Inculcate a sense of environmental ethics that focus research and concerns on sustainability.
- Inculcate strong moral and ethical values and a sense of discipline among the students.
- Ensure that the lessons are self-directed and lead to lifelong learning.

PROGRAMME SPECIFIC OUTCOMES

- Establish the position of Geography as a subject and its importance and interrelationships that reiterate and validate the Man and Environment relationship.
- In the course of field surveys, students acquire a greater understanding of the socio-economic and cultural dimensions of the populations with greater focus on marginalized section of society. Physical field surveys enable the students to understand the landforms, geomorphic process and associated hazards.
- Provide training to students in handling modern instruments and methods like Aerial Photographs, Satellite Imagery, Total Station and Meteorological instruments.
- Computer-based techniques are incorporated in the syllabus which prepares the students for further analytical studies.
- The students are directed towards problem analysis so that they can design and conduct independent research.

- The comprehensive syllabus promotes and develops a thorough knowledge of concepts, methods and theory.
- The Ability Enhancement Course strives to develop communication powers in the student, both written and oral.
- The Dissertations written by the students prepare them to examine social and environmental issues along with the causes, consequences and remedial measures emerging at local and national levels.
- The syllabus is oriented towards emerging job opportunities and future prospects for the students.
- Assistance is given to students in preparing for various competitive exams like NET, SET, SSC etc.

Course title : - (Paper I) Geomorphology (212009)

Programme outcomes:

After completing M.A. Geography programme students will :

Course Outcome:

Students would be able to:

CO1.Understand the effect of rotation of revolution the Earth

CO2. Understand interior structure of the earth

CO3. know the importance of longitudes & latitudes

CO4. International Date line and Standard time

CO5. Understand Theory regarding of Origin of Continents and oceans

CO6. Study the formation of Rocks .

CO7. Understand the work of internal and external forces and their associated Landforms.

CO8. Study the erosional and depositional land forms of Rivers and Sea Waves.

CO9. Understand the concept of mass Wasting Understand the Application of Geomorphology.

Course title : - (Paper II) Economics Geography (212010)

Course Outcome

Students would be able to

CO1. Acquire knowledge of the fundamental and modern issues in Economic Geography

CO2. To gain in-depth knowledge of the concepts and approaches; classification of Economic activities and their changing trend; theories of economic development; agricultural geography based on Von Thunen’s model and concepts of crop concentration, diversification,

combination; agricultural productivity and efficiency; industrial geography theories; industrial regions and spatial variation in production and transport costs and gain knowledge on transport and marketing geography .

CO3. Develop knowledge on geographical aspects of economy; types of economic activities conceptualize, demarcate and analyze the geographical determinates of agriculture and manufacturing activities.

CO4. Inculcate the knowledge of changing dynamics in the industrial and agricultural sector that will help them in their research studies.

Course title : - (Paper III) Geography of India (Physical and Resources) (212011)

Course Outcome

Students would be able to:

CO1. Know about their own countries land formation, climate and natural vegetation.

CO2. Understand the economic resources of India.

CO3. Understand the social distribution of population of their country.

CO4. Develop an idea about regionalisation of India.

Course title : - (Paper IV) HISTORY OF GEOGRAPHICAL THOUGHTS (212012)

Course Outcomes:

Students would be able to:

CO1. Acquire basic concepts in geographical thoughts through ancient.

CO2. Know medieval and modern periods; recent trends and explanations in geography

CO3. Develop philosophical and historical aptitude among students in the context of evolution
and development of geographical ideas, theme, approaches and knowledge Acquaint .

CO4. Study the philosophers of different schools of thought that have contributed in the development of geography as a branch of knowledge.

M.A. GEOGRAPHY II SEM.

Course title : - (Paper I) Climatology (220109)

Course Outcomes:
Students would be able to:

CO1. Understand the importance of Atmosphere

CO2. Understand heat balance.

CO3. Understand the types of winds

CO4. Understand the structure, composition of Atmosphere.

CO5. Understand weather phenomena winds, humidity and precipitation.

Course title : - (Paper II) Resource Management (220110)

Course Outcomes:

Students would be able to:

CO1. Have a comprehensive understanding of the various theories and concepts of geography and resource management.

CO2. Have specialized knowledge of a specific area of concentration in the field of geography and resource management and developed a capacity to theorize and generalize knowledge in their area of concentration.

CO3. Develop a life-long ability to analyze, explain and reflect on real-world spatial development and resource management issues covered in the curriculum.

CO4. Develop a capacity to apply various theories and methods of geography and resource management in their further studies and career development.

CO5. Apply various quantitative and qualitative geographical analysis and investigation techniques to find solutions for practical problems.

CO6. Develop essential generic skills such as critical thinking, problem solving and self-managed learning etc.

CO7. Possess communication, interpersonal and leadership skills that they can apply in real-world contexts.

CO 8. Embrace the perspective of sustainable development and become sensitive to their responsibilities with reference to spatial development and resource management issues.

Course Title : - (Paper III) Geography of India (220111)
Course Outcomes:
Students would be able to:

CO1: Acquire in-depth knowledge of climate, natural vegetation, agriculture and energy resources and industries of India.
CO2: Conceptualize the regional approaches and to examine regional differentiation in the study of India.
CO3. Recognize regional identities and environmental dimension of regionalization to address the issues and concern needed for regional planning.
CO4.. Acquire knowledge of the fundamental and modern issues in Economic

CO5. Gain in-depth knowledge of the concepts and approaches; classification of economic activities and their changing trend; theories of economic development;

CO6. Learn agricultural geography based on Von Thunen's model and concepts of crop concentration, diversification, combination; agricultural productivity and efficiency;

CO7. Industrial geography theories; industrial regions and spatial variation in production and transport costs and gain knowledge on transport and marketing geography

Course Title : - (Paper IV) Geography of Enviromment (220112)

Course Outcomes:

Students would be able to:

CO1. Gain knowledge about concept, scope of environmental geography and components of environment.

CO2. Develop an idea about human-environment relationships.

CO3. Build an idea about ecosystem.

CO4. Know about environmental programmes and policies.

Course Title : - (Paper IV) Geography Of Enviromment (220112)

M.A. GEOGRAPHY III SEM.

Course title : - (Paper I) Oceanography (320125)

Course Outcomes:

Students would be able to:

CO1. Understand the meaning, nature and scope, modern trends in Oceanography.

CO2. Understand the ocean floor and relief of the ocean bottom.

CO3. Understand the properties like temperature, density, salinity of ocean water.

CO4. Understand the characteristics and properties of factors affecting on formation of sea waves.

CO5. Understand the tides, tide generating forces, types of tides and tidal effects in coastal areas.

CO6. Get knowledge about distribution of lithogenous, biogenous, and hydrogenous sediments on ocean floor

Course Title : - (Paper II) Urban Geography (320126)

Course Outcomes:

Students would be able to:

CO1. Develop deeper understanding of urban geography.

CO2. Focus on establishing in-depth knowledge on spatial and temporal basis of urban studies; physical, social, cultural and economic setup of urban centers with special reference to India 18 Helps to understand, analyse and interpret the morphology of urban centres

CO3. Learn the significance of human activities, physical-biological and cultural Phenomena, across temporal and spatial variations, that influence the urban landscape

CO4. Acquire competency to address a variety of contemporary issues in the light.

CO 4. Learn rapid expansion of the dynamic disciplines Understand and appreciates the value of different perspectives to examine.

CO5. Learn complexities of urban life and the consequences inherent in the built-up envirment.

Course title : - (Paper III) Geography of Tourism (320127)

Course Outcomes:

Students would be able to:

CO1. To Students Understand about the tourism influencing factors: historical, natural, social cultural and economic study the tourism motivating factors for pilgrimages, leisure, recreation, elements.

CO3. Understand the Tourism types: eco-ethonocoastal and adventure tourism, national and International tourism, globalization and tourism.

CO4. To Study tourism attraction, evolution of tourism, promotion of tourism, case studies from in India.

CO5. Study and understand the environmental laws and tourism-current trends, spatial and recent

Changes, Tourism circuits-short and longer, accommodation and supplementary accommodation, other facility, Indian hotel industry.

Course Title : - (Paper IV) Agricultural Geography (320128)

Course Outcomes:

Students would be able to:

CO1. To introduce students Agricultural activities and its relation with Geography.

CO2. To familiarize the students with new modern technical methods and their applications in Agricultural activities.

CO3. To enable students to apply previously knowledge in Problems and Prospects in agricultur

M.A. GEOGRAPHY IV SEM.

Course Title : - (Paper I) Research Methodology (401227)

Course Outcomes:

Students would be able to:

CO1. Examine the introduction of research, motivation in research, types of research, significance of Research, research process and criteria of good research.

CO2. Understand the research problems, selecting research problems, literature review and to study the hypothesis, its types, sources, formation of hypothesis and utility of hypothesis in scientific research.

CO3. Understand the research design, need, features, basic principal and developing of research plan, and sampling design and its basic types, steps, characteristics of sampling design.

CO4. Study about type‟s data and methods of data collection and study the processing and analysis of data using different statistical methods.

CO5. Understand the interpretation and report writing, techniques, precaution of interpretation, layout of research report, types of reports and oral presentation mechanics of writing a research report

Course title : - (Paper II) Remote Sensing (401228)

Course Outcomes:

After completing this course, students would be able to:

Co 1. Understand the concepts of Photogrametry and compute the heights of objects
CO2. Understand the principles of aerial and satellite remote sensing, Able to comprehend the energy interactions with earth surface features, spectral properties of water bodies.
Co3. Understand the basic concept of GIS and its applications; know different types of data representation in
CO4. Understand and Develop models for GIS spatial Analysis and will be able to know what the questions that GIS can answer are
CO5. Apply knowledge of GIS software and able to work with GIS software in various application fields
CO6. Illustrate spatial and non spatial data features in GIS and understand the map projections and cordinates systems
CO7. Apply knowledge of GIS and understand the integration of Remote Sensing and GIS

Course Title : - (Paper III) Population Geography (401229)

Course Outcomes:

Students would be able to:

CO1. Develop the practical concepts of population geography and demographic studies related to
trends, patterns and measures of population dynamics
CO2. Acquire knowledge and training to collect and analyze data from the primary and secondary sources.
CO3. Apply requisite analytical and technical skills in diverse fields of population geography

CO4. Acquire competency in handling data from Census, NFHS, NSSO and related

CO5. Sources for further research work URBAN GEOGRPHY

Course Title : - (Paper IV) Biogeography (401230)

Course Outcomes:

Students would be able to
CO1. Learn the distribution patterns of the plants and animals and the processes involved focusing on its development and content,
CO2. Learn the concept of habitat, plant-animal association, zoogeography as well as phytogeography with the objectives of understanding the geography of living organism in the earth in a more analytical perspective.
Co3. See the animate world from geographical perspective

DEPARTMENT OF COMMERCE

Bachelor of Commerce (B.Com Plain)

Programme Specific Outcomes

After the completion of this particular course the student will be able :

- To work as audit assistant, tax consultant and other financial supporting services.
- To perform role as entrepreneur, businessman, manager, consultant.
- To pursue professional courses like C.A., M.B.A., M.Com, C.S.
- Contribute to the education field as teacher/Professor.
- To appear in various competitive exams and different certificate courses like Charted and Financial Analyst (CFA), Business Accounting and Taxation (BAT), Certificate Management Accountant (CMA), Certified Management Accountant (CMA), US Certified Public Accounting (CPA), Financial Risk Manager (FRM), Association of Chartered Certified Accountant (ACCA), Certified Financial Planner, Certificate in Investment Banking (CIB), B.Ed. digital marketing etc.

B.Com (Plain) I Year

Financial Accounting (Major 1)
Maximum Marks : 30+70
Minimum passing Marks : 33
Credit : 6

Course Outcomes	The students taking up this course of BCom with Financial Accounting (major) as a special subject of study receive the following outcomes:
CO-1	Gain conceptual clarity about theoretical framework of accounting.
CO-2	Understand the process of double entry accounting system.
CO-3	Acquire the basic understanding of final accounts of small / non corporate firms.
CO-4	Calculate amount of depreciation and value the investment price of different types of marketable investment.
CO-5	Acquire the basic ability of preparing Branch and Departmental Accounts.

Business Regulatory Framework (Major 2)
Maximum Marks : 30+70
Minimum passing Marks : 33
Credit : 6

Course Outcomes	The students taking up this course of BCom with Business Regulatory Framework (Minor) as a special subject of study receive the following outcomes:
CO-1	Understand basic aspect of contracts for making agreements, contracts and subsequently valid business proposition.
CO-2	Equip the students about the legitimate rights and obligation under sale of Goods Act
CO-3	Understand the fundamental of intemet based on activities under the information and Technology Act
CO-4	Enable the students with skills to initiate entrepreneurial ventures as LLP
CO-5	Learn how to pursue the consumer right under the Consumer Protection Act

Business Organisation and Communication (Minor)
Maximum Marks : 30+70
Minimum passing Marks : 33
Credit : 6

Course Outcomes	The students taking up this course BCom with Business Organisation and Communication (minor) as a special subject of study receive the following outcomes:
CO-1	Understand the basics of business
CO-2	Understand the basics of communication
CO-3	Imbibe how any business can be organised successfully
CO-4	Assess and analyse the various forms of organisational structure
CO-5	Elucidate how communication plays an important role in modern

	business scenario

Banking and Insurance (General Elective)
Maximum Marks : 30+70
Minimum passing Marks : 33
Credit : 4

Course Outcomes	The students taking up this course of BCom/BA/BSc with Banking and insurance (General Elective) as a special subject of study receive the following outcomes:
CO-1	Understand banking and insurance services for the economic growth of the country
CO-2	Understand the banking system, insurance procedure, practical banking etc.
CO-3	Understand the insurance system, insurance procedure, regulation of banking and lnsurance
CO-4	Make student capable to earn employment in the field of banking
CO-5	Make student capable to earn employment in the field of insurance

B.Com (Plain) II Year

Corporate Accounting (Major 1)
Maximum Marks : 30+70
Minimum passing Marks : 33
Credit : 6

Course Outcomes	The students taking up this course of BCom with Financial Accounting (major) as a special subject of study receive the following outcomes:
CO-1	An understanding of the regulatory environment in which the companies are formed and operate
CO-2	A solid foundation in accounting and reporting requirements of the Corporations Act and Accounting Standards
CO-3	Describe the rationale, merits, and demerits of issuing bonus shares for a company.
CO-4	Prepare financial statements (Profit &Loss Account, Balance Sheet, etc.) using online software.
CO-5	Prepare balance sheet after Internal Reconstruction of company;
CO-6	Analyse the case study of major amalgamations of companies in India.
CO-7	Describe the process of e-filing of annual reports of companies.

Cost Accounting (Major 2)
Maximum Marks : 30+70
Minimum passing Marks : 33
Credit : 6

Course Outcomes	The students taking up this course of BCom with Financial Accounting (major) as a special subject of study receive the following outcomes:
CO-1	know the principles, concepts, benefits, utility of cost accounting
CO-2	In the event of setting up your own industry, being self-sufficient in cost accounting, you will be able to acquire knowledge of the methods of material issue, control and laborpayment.
CO-3	Will be expert in finding out unit cost, finding tender price, finding contract cost and finding profit.
CO-4	Develop decision making ability through marginal cost analysis, standard cost analysis.
CO-5	Will be able to get employment as a cost analyst in small, big business.

Business Statistics (Minor 1)
Maximum Marks : 30+70
Minimum passing Marks : 33
Credit : 6

Course Outcomes	The students taking up this course of BCom with Financial Accounting (major) as a special subject of study receive the following outcomes:
CO-1	Apply a basic knowledge of statistics to business disciplines;
CO-2	Develop the ability to analyze and interpret data to provide meaningful information to assist in management decision making activities;
CO-3	Apply appropriate graphical and numerical descriptive statistics for different types of data;
CO-4	Apply probability rules and concepts relating to discrete and continuous random variables to answer questions within a business context;
CO-5	Explain and interpret a variety of hypothesis tests to aid decision making in a business context;
CO-6	Use simple/multiple regression models to analyze the underlying relationships between the variables.

Principles of Management (Elective)
Maximum Marks : 30+70
Minimum passing Marks : 33
Credit : 4

Course Outcomes	The students taking up this course of BCom with Financial Accounting (major) as a special subject of study receive the following outcomes:
CO-1	Demonstrate understanding of the role **of** managers in an organization

CO-2	Summarize the elementary concepts, principles and theories of management
CO-3	Examine the managerial functions having an impact on the organization Effectiveness.
CO-4	Identify the contemporary issues and challenges in management
CO-5	Develop ethical workplace practices
CO-6	Appraise the sources of influence to inspire the actions of other organizational members and evaluate the best control methods.

B.Com Plain Third Year

Course Title: (Paper I) Income Tax Law & Practice

Course Outcomes: Students would be able to:

- Update the current finance tax planning and to understand Indian Taxation system.
- Study salary head of income and its related provisions.
- Analyze the profit and gain from business or profession.
- Study various provision related to set off and carry forward of income
- Gain knowledge about the process of filling up of returns.

Course Title: (Paper II) Goods & services Tax & Custom Duty

Course Outcomes: Students would be able to:

- Know the basic methods and legal provisions of indirect taxes
- Familiarize with GST.
- Know the GST LAW 2017
- Acquire knowledge with respect to custom laws.

Course Title: (Paper III) Principles of Marketing

Course Outcomes: Students would be able to:

- Understand the Modern marketing concepts
- Provide knowledge about marketing mix, segmentation, targeting and positioning and Consumer behaviour
- Get clear idea of product planning, Diversification, Elimination and pricing strategies.
- Summarize marketing of consumer goods, channels of distribution and understand the pricing policing.
- Practice and act of sales promotion.

Course Title: (Paper IV) International Marketing

Course Outcomes: Students would be able to:

- Familiarize studier in International Marketing

- Get knowledge about product planning for in the International market.
- Get knowledge about International pricing policies for a product.
- Have insight into the International distribution channels.
- Gain knowledge about the EXIM policy.

Course Title: (Paper V) Management Accounting

Course Outcomes: Students would be able to:

- Know the basics of management accounting
- Study the financial statement analysis
- Familiarize fund flow cash flow statement
- Analyze various budget
- Familiarize with marginal costing

Course Title: (Paper VI) Auditing

Course Outcomes: Students would be able to:

- Gain knowledge about auditing, audit programmes, working papers and preliminaries before audit.
- Analyze about implementing internal check and internal control in concerns.
- Understand the various aspects of vouching.
- Learn how to verify and value various assets and liabilities
- Evaluate the traits of Company Auditor and how to draft Auditors Report.

Master of Commerce (MCom)

Program Outcomes:

- Impart the students with practical knowledge and understanding of contemporary trends in commerce and business finance.
- Ready the students to assess and understand environmental factors that influence business operation with the abstract ideas and ability to evaluate financial statements.
- Ready the students with proper knowledge on the proficient use of tools of statistics to analyze business data.
- Help the students to apply capital budgeting techniques for investment decisions and to appraise the structure and operations of banking system.
- Develop competency in the students about the laws and regulations, and roles of commercial, government and central banks in controlling money market and inflation
- Provide guidance to students to plan and undertake independent research in a chosen discipline.
- Train the students to become an asset to society through teamwork, lifelong learning and continuous professional development.

Program Specific Outcomes:

- Students will be well prepared to integrate theory and practices of subjects learned and translate them into their professional behavior.
- Students will be fully employable with essential skills like, analytical thinking, clear communication, effective teamwork and ethical business practices.
- Students will have clear understanding to interrelationship of concept learned with business and its environment.
- Students will exhibit inclination towards starting their own entrepreneurial ventures.
- Students will demonstrate the understanding and ability to undertake independent research projects and application of statistical methods and tools for modeling and analysis of business data.

M.Com First Semester

Course Title: (Paper I) Management Concepts

Course Outcomes:

- To explain Strategic Management in business operations defining Management identifying relevant Management skills and issues along with the various aspects of Management concepts Nature and scope of Management with special reference to approaches to Management, human relations, behavioural and Systems approach.
- To teach the students about Global situations including opportunities and threats that will impact Management of an organization forecasting and decision-making aspects.
- To explain various Management principles and Management practices teaching, Organizing, Staffing and various aspects of selection training and evaluation of performance appraisal and delegation of authority.
- To orient students about leadership styles and to anticipate the consequences of each leadership styles with various aspects of motivation and to teach theories of motivation.
- Students will be able to discuss and communicate the Management concepts and how it will affect future Managers and also to observe and evaluate the influence of Managerial knowledge and current practices of Management.
- Knowledge to identify and evaluate social responsibilities and ethical issues involved in business situations, Managerial situations and logically articulate on position on such issues along with explaining how organizations attached to an uncertain environment and identify techniques managers used to influence and control the internal environment of business organizations.
- Ability to practice the process of Management’s 4 functions Planning, Organizing, Leading and Controlling, also to identify and properly use vocabulary within the field of Management to articulate one's own positions on a specific management issue and communicate effectively with varied departmental heads and different posts of Management.
- Ability to evaluate leadership styles to anticipate the consequences of each leadership style and analyse both qualitative and quantitative information to isolate issues and

formula best control methods along with delegation of authority Departmentation, Centralization and Decentralization.

Course Title: (Paper II) Business Environment

Course Outcomes:

- To understand the concept, significance and changing dimension of Business Environment
- To understand Political Economical Socio-cultural and Technological environment of a business
- To understand the importance of Multinational corporations, foreign collaborations and International Economic Institutions
- Foreign trade policies, Patent laws, Policy on Research and Development and Technology transfer
- Identify different types of Business Environment
- Recognize tools for examining the Environment
- Explain the role of economic systems, economic planning, government policies, public sector and development banks, economic reforms, liberalization, patent laws and its impact on business.
- Realize the importance and impact of changing laws and regulations on a business firm.
- Find out emerging dimensions in socio-cultural environment and its relevance for a business firm

Course Title: (Paper III) Advanced Accounting

Course Outcomes:

- To assign the practical approach to the students regarding the preparation of final accounts with advanced adjustments.
- To communicate the presentation of the Investments A/c along with ex and cum interest calculations.
- To provide basic knowledge to the students regarding dissolution of partnership firm. 4.To clear the concepts of the students regarding the accounts of the nonprofit to organizations, and the preparation of the bank reconciliation statement
- To illustrate the procedure and accounting treatment of the Insolvency A/c and rectification journal entries.
- Understand the method of presentation of the financial statement.
- Develop the understanding and skill to prepare the Bank reconciliation statement.
- Prepare and present the financial statement of Non-Profit Organization.
- State accounting entries regarding the investment, insolvency and rectification.
- Solve advance problems related with dissolution of the firms.

Course Title: (Paper IV) Cost Analysis and Control

Course Outcomes:

- Learn Costing methods for Manufacturing and Non-manufacturing concerns
- Learn Cost allocation and its impact
- Learn Identify profitable products and services
- Learn Use data for decision making and performance evaluation
- Learn Cost analysis for cost control
- Learn the operational analysis- Determination of cost, BEP
- Learn improvement techniques for business cost control- Material
- Learn how the efficiency of business is evaluated-Parameters
- Learn the impact of cost allocation and issue pricing- Right technique
- Learn to make critical but rational decisions based on analysis

MCom Second Semester

Course Title: (Paper I) Corporate Legal Framework

Course Outcomes:

- To make students aware about the existing provisions on companies, negotiable instruments and Competition act.
- To let students know the various cases over companies and organisations which were adversely affecting the competition in the market and the action taken by CCI.
- To teach students the Consumer Protection Act and to make them aware about the series of authorities which can be approached if being a consumer they are cheated upon in the market.
- Students can work in organizations like CCI office, Company Secretary's office, etc as they are well versed with the needed laws and provisions.
- Students can approach the authorities to demand action under Consumer Protection Act.
- They will be more cautious while handling cheques and other negotiable instruments because they know the impact now.

Course Title: (Paper II) Organizational Behaviour

Course Outcomes:

- This course is designed to equip the students with the tools necessary to understanding the dynamics of individual and group behavior for efficient and effective utilization of human resources in the organizations.
- Broadly, the course intends to help the students to understand and analyze the individual needs, feelings, aspirations.
- Develop skills needed to plan for the implementation of change in an organization. Identify and develop effective motivational and leadership skills.

- Demonstrate an understanding of theories, principles and concepts applicable to the study of organisations and management.
- Evaluate and analyze how the study of organizational behaviour can aid us in improving managerial processes and practices.
- Understand how models, theories and concepts about organizational behaviour can be used in practice in different workplaces across difference regions of the world. Critically evaluate models and theories explored throughout the module.

Course Title: (Paper III) Advanced Statistical Analysis

Course Outcomes: Students will be able to**:**

- Distinguish between discrete and continuous random variables
- Explain the assumptions of binomial distribution and apply it to calculate probabilities.
- Explain why populations are sampled and describe methods to sample a population.
- Elaborate central limit theorem
- Use a t statistic to test a hypothesis, methods of interpolation and extrapolation, perform a chi square test for independence on a contingency table and a goodness fit test and ANOVA to test a hypothesis that three or more population means are equal
- Apply regression analysis to estimate the linear relationship between two variables and Classify data and apply yule's coefficient

Course Title: (Paper IV) Functional Management

Course Outcomes:

- To explain and provide opportunities to apply foundation business knowledge and skills to develop competent decisions in the areas of Financial Management and Financial Planning.
- Explain theories of capitalisation and various important concepts and terminology of Financial Management. To explain concept of Marketing Management, Marketing Mix and Advertising Management.
- To explain various concepts of Personnel Management with special reference to Special Recruitment Policies, Training and Development. To explain various aspects of Production Management, concepts of Production Planning, New Product Development and Concepts of Product Diversification.
- Students will learn and will get detailed knowledge about Financial Management, Functions of Financial Management, Financial Planning and Financial Plan.
- Students will get detailed knowledge about Capitalisation, Theories of Capitalisation, over and Under Capitalisation, Capital Structures, trading on Equity and Leverage.
- Students will obtain knowledge about various concepts of Marketing Management, Marketing Mix, Advertising Management, Sales Promotions and Modern Marketing Concepts.
- Students will learn and will develop their skills and knowledge about various aspects of personnel Management, Manpower Planning, sources of Recruitment, Selection,

Training and Development and also rules and methods of forming effective Personnel Management

- Students will learn various concepts, importance, scope and functions of Production Management. They will also be taught about the concepts of Production Planning, Production Control, New Product Development, Concept of Product Diversification, Standardisations, Simplification and Specialisations.

M.Com Third Semester

Course Title: (Paper I) Managerial Economics

Course Outcomes: Students will be able to understand the importance of managerial economic concepts and its relevance:

- To make the students aware about the basic concept of managerial economics and its applicability. To demonstrate the knowledge of demand, Elasticity and their application and explain the concept of utility, indifference analysis and consumer surplus.
- To help students to understand concept of demand and the theory of consumer choice, indifference analysis, consumer surplus and their applicability. Students will be able to classify the production laws and theories.
- To know the basic theories of production, relation between cost and revenue. To familiarize the student with the concept of business cycles and various theories. They will be able to examine various theories of business cycles.
- To develop an understanding on Profit and uncertainty. Students will be able to explain and comprehend the economic meaning of profit maximization.

Course Title: (Paper II) Tax Planning and Management

Course Outcomes:

- To make the students aware of the corporate tax laws of India. Students will be able to identify the difference between tax evasion, tax avoidance and tax planning and tax management and how the provisions in the corporate tax laws can be used for tax planning.
- Understanding the corporate tax laws and uses it for tax planning. Students of the course will be able to explain different types of incomes and their taxability and provisions in respect of Free Trade Zone, Infrastructure Sector, Backward areas.
- To make the students aware of what business income is and when it gets taxed. Students will be able to outline the corporate tax laws and their provisions related to financial and managerial decisions.
- The course also provides students with knowledge the difference between tax avoidance and tax planning. Students will able to plan tax in relation to setting up new business.

- To enable the students about Return of Income and Assessment, Penalties and Prosecutions and Appeals and Revisions. Students will be able to file the returns and assessment independently.

Course Title: (Paper III) Entrepreneurship Skill Development

Course Outcomes: After the successful completion of the course the students should be able to:

- Expose the students to the fundamentals of Entrepreneurship. Understand different methods to assess the attractiveness of business opportunities
- Develop the understanding towards different methods for assessing the attractiveness of business opportunities. Understand different innovation and entrepreneurship theories and their implications.
- Make them understand the process of business idea generation and converting the idea into a business model. Detect weaknesses and strengths within a business opportunity and give suggestions for improvement.
- Make them understand the role of government and the machinery that renders support in terms of policies, assistances etc. for creation, sustenance and growth of the enterprises by the individuals. Design, organize, and lead a team with the goal of bringing new products and services to market.

Course Title: (Paper IV) Accounting for Managerial Decisions

Course Outcomes: After completing the course, you shall be able to:

- Make students understand Management Accounting, different methods of financial statement analysis, Fund Flow and Cash Flow Statement and Capital Budgeting Techniques.
- Understand Management Accounting, Financial Accounting & Cost Accounting conceptually and take an overview of the Accountant's role, meaning of Responsibility centers and Transfer pricing concept.
- Help students to prepare for a job as a Managerial Accountant.
- Understand the utility of Ratio Analysis, Financial Statements and Cash Flow Analysis in any organization.
- Make students understand how to use accounting information to make business decisions, how to interpret accounting numbers, and how to understand internal systems.
- Sharpen their analytical and financial reporting skills. Comprehend different contemporary issues in Management Accounting and Reports & Reporting needs & Reporting Levels in an organization.

MCom Fourth Semester

Group: Marketing Management

Course Title: (Paper I) Advertising & Sales Management

Course Outcomes:

- To learn and understand the basic concepts and terminology in advertising with an emphasis on integrated marketing communication. Articulate the role of advertising and explore how it differs from other types of marketing communication.
- To understand and effectively utilize creative elements in advertising campaigns. Identify some of the positive and negative effects that advertising has on contemporary society.
- To understand the meaning of advertising agencies and their selection. Analyze the expanding environment of media and communication techniques.
- Identify the roles of advertising, sales promotion, public relations, personal selling, and direct marketing in the promotion mix. Examine the importance of market segmentation, position and action objectives to the development of an advertising and promotion program.
- To know the objectives of sales force management, its recruitment and selection. Develop creative strategies for advertising. Plan media strategy, scheduling, and vehicle selection. Assess strategic uses of sales promotions.

Course Title: (Paper II) Consumer Behaviour

Course Outcomes: At the end of this syllabus all the students will be able to

- To clear the concepts of consumer behaviour and its determinant to the students. Analyze the buying behavior of Indian consumers and factors influencing their behavior.
- To elaborate the buying process of consumers to the students. They will be able to perform any type of consumer research for any agency engaged in marketing research.
- To discuss organisational buying behaviour with its features and process. They shall also learn how to motivate consumers to buy a product or service with help of different techniques.
- To analyze the consumers need and motivations in detail. This course will enable them to search advance career opportunities directly related with consumer, marketing, selling and market research.
- To give information regarding various class of consumers, its theories s and understanding procedure of consumers diversity

Course Title: (Paper III) Rural and Agricultural Marketing

Course Outcomes:

- To enable students in understanding the basic concepts, importance, challenges, different facets etc. of rural and agricultural marketing. Explore the various facets of rural marketing and develop an insight into rural and agricultural marketing regarding different concepts and basic practices in this area.
- To understand the different market structure and components, types of regulated markets etc. Identify the challenges and opportunities in the field of rural and agricultural marketing.
- To facilitate students about the different process and sales methods in agricultural and rural marketing.
- To acquaint the students with the appropriate concepts and techniques in the area of rural and agricultural marketing –like distribution channels, regulated markets etc.
- Students will get insight into different process and sales methods.

Course Title: (Paper IV) International Marketing

Course Outcomes:

- To develop knowledge and understanding of key issues associated with international marketing. To develop knowledge and understanding of Importance of global and international marketing.
- To develop knowledge and understanding of Motives to internationalization.
- To develop knowledge and understanding of the influence of macro-environment on market selection. To develop knowledge and understanding of Market entry modes.
- To develop knowledge and understanding of Specific international issues affecting the 4Ps. To develop knowledge and understanding of Financial, ethical, and organizational issues involved in international marketing.
- To develop skills in researching and analyzing international marketing opportunities. Developed an understanding of major issues related to international marketing.
- Developed skills in researching and analyzing trends in global markets and in modern marketing practice. Able to assess an organization's ability to enter and compete in international markets.

MCom Forth Semester

Group: Accounting

Course Title: (Paper I) Corporate Accounting

Course Outcomes: On the successful completion of this course the student will be able:

- To provide thorough and complete knowledge related to the subject.
- To help the students understand the techniques of restructuring and liquidating the corporate entities.

- To provide the student with knowledge of recent developments in corporate accounting. To teach them the Various Requirements of Corporate Reporting.
- To gain knowledge and understanding of the concepts and practices of company accounts in accordance with statutory requirements. The ability to prepare financial statements, consolidated accounts for a corporate group.
- A comprehensive understanding of the advanced issues in accounting for assets liabilities and owner's equity. To Analyze the Financial Statement of different companies

Course Title: (Paper II) Cost Administration and Control

Course Outcomes:

- To understand the application of Marginal Costing in decision making. Decision making made possible in the areas of pricing and cost control based on different real-life situations.
- To know the procedural details about Budgets. The policy making learning for budgets.
- To analyze different pricing techniques in varied situations. To learn the process of cost reduction.
- To learn the implementation of various cost control techniques. Awareness towards Total Quality Management in costing.
- Awareness of Value analysis and Inventory control techniques. Learning of Product Life Cycle costing and Feedback control system

Course Title: (Paper III) Accounting Theory

Course Outcomes:

- To provide thorough and complete knowledge related to the subject.
- To help the students understand the role of theory in understanding current accounting standard, accounting practices & the use of accounting information by the myriad stakeholders in reporting entities.
- To provide the student with knowledge of recent developments in accounting Framework.
- To teach them the Various Requirements of Accounting Standard. This course highlights the role of theory in understanding current accounting standard, accounting practices & the use of accounting information by the myriad stakeholders in reporting entities.
- To demonstrate an understanding of contemporary issues in financial accounting. To analyze& interpret professional accounting literature to prepare financial statement according to generally accepted accounting principles.

Course Title: (Paper IV) Institutional Accounting (Accounting)

Course Outcomes:

- Students will be able to identify analyses and evaluate organizations' business functions. They will also be able to recommend Creative Solutions to business problems. They will be able to apply accounting practices to communicate financial and managerial information to stakeholders effectively.
- To prepare students for advanced academic studies as well as for careers in public accounting, private industry, government and nonprofit sectors.
- Students will recognize commonly used financial statements, their concepts and how information from business transactions flows into these statements.
- Students will learn relevant financial accounting career skills, applying both quantitative and qualitative knowledge to their future careers in business.
- Students will be able to demonstrate knowledge of various Advanced Accounting issues related to financial accounting with in a global and ethical framework.

DEPT. OF SELF-FINANCE COMMERCE

B.Com (Tax Procedure and Practices & Computer Application)

Programme outcomes, Programme Specific Outcome and Course Outcomes

Programme Name: BCom (Tax Procedure and Practices & Computer Application**)**

Programme Outcomes:

PO1- Enables learners to get theoretical and practical exposure in the commerce sector which includes Accounts, Commerce, Management, Computer Application, Warehousing Taxation, Environment etc.

PO2- Students will be able to design and implement a web page. Students will be able to perform E-Banking, E-Marketing, E-Learning, and E-Shopping. Students will be able to perform any C++ programming tasks.

PO3- Develops communication skills and build confidence to face the challenges of the corporate world. Enhances the capability of decision making at personal and professional levels. Develops entrepreneurial skills amongst learners.

PO4- Strengthens their capacities in varied areas of commerce and industry aiming towards holistic development of learners.

PO5- Thus, after completing their graduation learners develop a thorough understanding of the fundamentals in Tax Procedure and Practices and Finance.

PO6- A Wide range of opportunities are opened in this field and more people are choosing this subject as their carrier.

PO7- Students have a plethora of choices to pursue professional courses such as CA, MCOM, MBA, CMA, ICWA, CS, CFA, etc.

Skill Outcomes

- To provide the knowledge of Taxation system in India and to enhance employability skills of the Commerce students
- Analyze the scope of the business by adopting modern technology in the business practice
- To motivates the learners towards higher education and The course helps the students to prepare for competitive and professional examination
- The introduction of updated and the need of the hour concepts and contents will make a student employable and at the same time confident in his/her day to day transactions.
- The programmed cultivates the habit of entrepreneur and there by motivates student to start entrepreneurship.
- Students will improve their computer literacy, their basic understanding of operative systems and a working knowledge of software commonly used in academic and professional environments
- Develop proficiency in the management of an organization.
- Attain skills in conducting business transactions online.

Course Outcomes

B.Com (Tax & Comp.App)- I Year

{ Tax Procedure and Practice & Computer Application }

a. **Tax Procedure and Practices (Elective):**
b. To understand the income Tax.
c. To Use income Tax in different heads.
d. Troubleshoot, issue related to working with income Tax.
e. To Know about Exempted income and Deduction from Gross Total income.

OR

a. **Computer Fundamentals (Elective):**
b. To understand the fundamental of computer.
c. To use computer in his daily life as well as can do assigned official work with ease.
d. Troubleshoot, issue related to the working with computer and internet.
e. To communicate through internet as well as can use IT for day to day.

1. Desktop Publishing (Vocational):

a. Understand basics of computer and its related terminology.
b. Write, Edit & print documents using MS-WORD & Excel.
c. Understand various software used for Desktop Publishing and would be able to create and design documents with text and graphics like newspaper ad, wedding cards, visting cards, greeting cards etc.
d. Using Pagemaker, Corel Draw & Photoshop, Understand Color Concept in Printing.

2. Web-Designing (Vocational):

a. Code a handful of useful HTML & CSS examples.

b. Build Semantic, HTML & CSS webpage.
c. Write basic scripts.
d. Use Names, Objects, and Methods
e. Add interactivity to a web Page.

3. Financial Account (Major)-I:

a. To gain knowledge on preparation of accounts in Hire purchase and Installment system.
b. To acquire the skill to prepare different types of branch accounts
c. To transform the accounting knowledge in preparing departmental accounting.

4. Business Regulatery & Framework (Major)-II:

a. To equip with the provisions of Law of Contract, 1872 and enable them to discuss and restate the same.
b. To equip with the provisions of Sale of consumer Act, 1986 and enable them to discuss and outline the same.
c. To equip students with the provisions of Negotiable Instruments Act, 1881 and enable them to describe and recall the same.

5. Business Organization & Communication (Minor):

a. To be familiar with the complete course outline/Course Objectives/Learning Outcomes/ Evaluation Pattern & Assignments.
b. To participate in an online learning environment successfully by developing the implication-based understanding of Paraphrasing, deciphering instructions, interpreting guidelines, discussion boards & Referencing Styles.
c. To distinguish among various levels of organizational communication and communication barriers while developing an understanding of Communication as a process in an organization.

B. Com Second Year

B.Com(Tax & Computer App.) II yr {Tax Procedure and Practice & Computer Application}

1. **GST (Elective)**
   a. Understand the development and different sub-structures under GST.
   b. List and identify what instruments are taxable under GST.
   c. Examine the process of implementation of GST.

OR

1. **Programming in C (Elective)**
   a. Develop a C program.
   b. Control the sequence of the program and give logical outputs.

c. Implement strings in your C program.
d. Store different data types in the same memory.
e. Manage I/O operations in your C program.
f. Repeat the sequence of instructions and points for a memory location.

2. **E-Commerce (Vocational)**

a. Impart the students with higher level knowledge and understanding of contemporary trends in e-commerce and business finance.
b. To provide adequate knowledge and understanding about E-Com practices to the students.•
c. Learners will be able to recognize features and roles of businessmen, entrepreneur, managers,• consultant, which will help learners to possess knowledge and other soft skills and to react aptly when confronted with critical decision making

3**. Corporate Account**--Major **I:**

a. To understand the provisions of Company Act 2013.
b. To familiarize on capital structure and the procedure of share allotment.
c. To attain knowledge on rights and duties of shareholders, members and types of meetings in the companies.

4**. Cost Account**--Major**II:**

a. To familiarity with the estimation and controlling of material cost
b. To understand the estimation and controlling of labor cost
c. To able to prepare cost sheet.

5**. Principle of Statistics**-Minor

a. To use regression analysis to estimate the relationship between two variables and to use frequency distribution to make decision.
b. To understand the techniques and concept of different types of index numbers.

c. To understand the different concept of population and sample and to make students familiar with Calculation of various types of averages and variation.

BCom Third Year

(Tax Procedure and Practice & Computer Application)

Group: Tax Procedure and Practice

Course Title : - (Paper I) Tax planning and Management

Course Outcomes: Students would be able:

CO1- To collect the basic concepts and definitions of Income Tax Act 1961
CO2- To familiar with the computation of income from house property
CO3- To familiar with the computation of income from business and profession

Course Title : - (Paper II) Corporate Tax

Course Outcomes: Students would be able:

CO1- To understand the provisions of Company Act 2013.
CO2- To attain knowledge on rights and duties of shareholders, members and types of meetings in the companies.
CO3- To familiar with rules and regulations relating to appointment of directors
CO4- To acquire the knowledge on modes and procedure of winding up of companies.

Group: Computer Application

Course Title : - (Paper I) Web-Designing

Course Outcomes: Students would be able:

CO1- Become familiar with graphic design principles that relate to web design and learn how to implement theories into practice.
CO2- Develop skills in analyzing the usability of a web site.
CO3- Learn the language of the web: HTML and CSS. Develop basic programming skills using Javascript and jQuery.

Course Title : - (Paper II) Digital Marketing
Course Outcomes: Students would be able:

CO1- The greatest outcomes are that, it allows you to target your ideal buyers.
CO2- Digital marketing helps you connect with mobile customers. It can easily and quickly adapt your strategy and tactics for best results.
CO3- SEO and local SEO helps you to reach and more qualified buyers online.

Group: Account

Course Title : - (Paper I) Income Tax Law and Practice

Course Outcomes: Students would be able:

CO1- To know about the aggregation of income and deduction u/s 80C to 80U
CO2- To know about the assessment of individuals.
CO3- To aware about the income tax authorities and their powers and duties.

Course Title : - (Paper II) Indirect Tax (GST)

Course Outcomes: Students would be able:

CO1- To create employability to the students in the commercial tax practices.
CO2- To understand the procedure for registration, payment and refund of GST
CO3- To know tax related with movement of goods.

Group: Management

Course Title : - (Paper I) Management Accounting

Course Outcomes: Students would be able:

CO1- To understand the basic concepts of management accounting
CO2- To enable the students to understand different ratios used for analyzing financial Statements
CO3- To understand the analysis of financial statements by using various methods

Course Title : - (Paper II) Auditing

Course Outcomes: Students would be able:

CO1- Described about the concept, types & methods of auditing.
CO2- Acquired knowledge about vouching of cash and credit transactions, verification of assets and liabilities Comprehend the knowledge about appointment, rights, duties and responsibility of auditor.
CO3- Acquired knowledge of audit documentation and audit evidence.

DEPARTMENT OF COMPUTER SCIENCE AND APPLICATION

B. Sc. Computer Science

Programme Outcomes, Programme Specific Outcomes and Course Outcomes

Program Outcomes:

PO1- Bachelor in Computer Science is an undergraduate programme that focuses on the knowledge of Computer Science and Application and Information Technology.
PO2- Develop ability to pursue advanced studies and research in computer science.

PO3- The primary goal of this programme is to empower the young generation with the essential knowledge of computers and abilities to peruse satisfying jobs in the ever changing world of Information Technology sector.

PO4- To produce entrepreneurs who can innovate and develop software product. It provides an academic base to students to explore their career opportunities in IT sector and also contribute in the economic development of their country.

Program Specific Outcomes:

PSO1- After completion of Bachelor of Computer Application programme students will be able to work in IT industries, public and private sectors.

PSO2- Students will be able to work in different profiles like software engineer, web developer, UI designers, Testers, coders, SEO, data analyst, hardware engineer, etc.

BSc Computer Science First Year

Course Title: (Paper-I) Computer System Architecture-

Course Outcomes: Students would be able to:

CO1- Understand the basic structure, operation and Characteristics of digital computer.

CO2- Explain the digital computer method.

CO3- Understand concept and advantages of parallelism, threading, multiprocessors and multicore processors..

CO4- Know the contributions of Indians in the field of computer architecture and related technologies.

Course Title: (Paper-II) Computer Architecture lab-

Course Outcomes:

CO1- Realization of the basic logic and universal gates.

CO2- Verify the behavior of logic gates using truth tables.

CO3- Learn how to apply logic for problems.

CO4- Enhance their programming skills.

Course Title: (Paper-III) Programming Methodologies and Data Structures {M inor}

CO1- Develop simple algorithms and flow charts to solve a problems with programming using top down design principles.

CO2- Lean to formulate iterative solution and array processing algorithms/ programs.

CO3 – Implement and know the applications of algorithms for searching and sorting etc.

Course Title: (Paper-IV) Office Tools and Programming Methodology Lab. {M inor}

CO1- Develop simple alogorithms and flow charts to solve a problem with programming usings top down design principles.

CO2- Implementation of algorithms for searching and sorting.

CO3- Possess ability to choose a data structure to suitably model any date used in computer applications.

BSc Computer Science Second Year

Course Title: (Paper-I) Computer Networks & Information Security

1. Define and describe the components of Data Communications system such as Various protocols, OSI Model, Data transmission in analog and digital format.
2. Identify and differentiate among the network devices and drivers.
3. Learn and describe various error detection and correction methods. Define the various terminologies used in Network and Application layers.
4. Compare the various network technologies and can decide the suitable technology installation as per requirement and environment at any workplace.
5. Describe the various protocols and can identify the application areas of each protocol.
6. Know the fundamentals of network and information security issues, laws, and various security technologies which can be applied on work place

Course Title: (Paper-II) Object Oriented Programming with Java

1. Implement object Oriented programming concept using basic syntaxes of control structures, strings and function for developing skills of logic building activity.
2. Identify classes, objects, members of a class and the relationships among them needed for a finding the solution to a specific problem.
3. Demonstrates how to achieve reusability using inheritance, and packages and describes faster application development can be achieved.
4. Demonstrate understanding and use of different exception handling mechanisms and concepts of multithreading for robustfaster and efficient application development.
5. Identify and describe common abstract userinterface components to design GUI in Java using Applet & AWT along with response to events.
6. Identify, Design&Develop complex Graphical user interfaces using principal Java Swing classes based on MVC architecture.
9. Compare various device scheduling algorithms

BSc Computer Science Third Year

Course Title: (Paper-I) Programming with Python

1.To understand why Python is a useful scripting language for developers.
2.To learn how to use lists, tuples, and dictionaries in Python programs.
3. To learn how to identify Python object types.
4. To learn how to use indexing and slicing to access data in Python programs.
5. To define the structure and components of a Python program.
6.To learn how to write loops and decision statements in Python.
7. To learn how to write functions and pass arguments in Python.
8. To learn how to build and package Python modules for reusability.
9. To learn how to read and write files in Python.
10. To learn how to design object-oriented programs with Python classes.

Course Title: (Paper-II) Operating System

Course Outcomes:

1.To understand Complexity of Operating system as a software
2. To understand design issues related to process management and various related algorithms
3.To understand design issues related to memory management and various related algorithms
4.To understand design issues related to File management and various related algorithms
5.Allocate Main Memory based on various memory management techniques
6. Compare Memory allocation using Best fit, Worst fit, and first fit policies
7. Apply page replacement policies for dynamic memory management
8. Schedule CPU time using scheduling algorithm for processors

Bachelor of Computer Application (BCA)

Programme Outcomes, Programme Specific Outcomes & Course Outcomes

Program Outcomes:

PO1- Bachelor in Computer Application is an undergraduate programme that focuses on the knowledge of Computer Science and Application and Information Technology.

PO2- The primary goal of this programme is to empower the young generation with the essential knowledge of computers and abilities to peruse satisfying jobs in the ever changing world of Information Technology sector.

PO3- It provides an academic base to students to explore their career opportunities in IT sector and also contribute in the economic development of their country.

Program Specific Outcomes:

PSO1- After completion of Bachelor of Computer Application programme students will be able to work in IT industries, public and private sectors.

PSO2- Students will be able to work in different profiles like software engineer, web developer, UI designers, Testers, coders, SEO, data analyst, hardware engineer, etc.

BCA First Year

Course Title: (Paper-I) COMPUTER FUNDAMENTALS, ORGANIZATION & ARCHITECTURE

Course Outcomes:

CO1- Demonstrate the use of mathematical software and solve simple mathematical problems.
CO2- Explain the needs of hardware and software required for a computation task.
CO3- State typical provisions of cyber law that govern the proper usage of Internet and computing resources.
CO4- Explain the working of important application software and their use to perform any engineering activity.
CO5- Demonstrate the use of Operating system commands and shell script.
CO6- Understand about concepts of Computer Organization and design.
CO7- Understand and implement Instruction codes and op-codes.
CO8- Understand Registers, Computer Instructions, timing and control.
CO9- Understand CPU basics, Stack Organization, Instruction format, Addressing formats.
CO10- Understand Memory system of a Computer & Understand basics of 8-bit Microprocessor

Course Title: (Paper-II) PROGRAMMING METHODOLOGY & DATA STRUCTURES

Course Outcomes:

CO1- Develop simple algorithm and flow charts to solve a problem with programming using top down design principles.
CO2- Writing efficient and well-structured computer algorithms/programs.
CO3- Learn to formulate iterative solutions and array Pricessing alogoriths for Problesms.
CO4- Use recursive techniques, pointers and searching methos in programming.
CO5- Will be familiar with fundamental data structures, their implementation.

BCA Second Year

Course Title: (Paper-I) PROGRAMMING WITH C++ AND DATA STRUCTURES
Course Outcomes:

CO1- Apply C++ features to program design and implementation.

CO2- Explain object-oriented concepts and describe how they are supported by C++ including identifying the features and peculiarities of the C++ programming language.

CO3- Use C++ to demonstrate practical experience in developing object-oriented solutions.

CO4- Design and implement programs using C++.

CO5- Analyze a problem description, design and build object-oriented software using good coding practices and techniques.

CO6- Implement an achievable practical application and analyze issues related to object-oriented techniques in the C++ programming language.

CO7- Learn and implement Arrays, Stacks and Queues and various operations on array.

CO8- Learn and implement the concept of Linked List.

CO9- Learn and implement the concept of various types of Trees.

CO10- Learn and implement Graph and Graph traversal techniques.

Course Title: (Paper-II) Computer Based Numerical and Statistical Techniques

Course Outcomes:

CO1- Obtain an intuitive and working understanding of numerical methods for the basic problems of numerical analysis.

CO2- Gain experience in the implementation of numerical methods using a computer.

CO3- Trace error in these methods and need to analyze and predict it.

CO4- Provide knowledge of various significant and fundamental concepts to inculcate in the students an adequate understanding of the application of Statistical Methods.

CO5- Demonstrate the concepts of numerical methods used for different applications

Course Title: (Paper-III) OPERATING SYSTEM

Course Outcomes:

CO1- Gain extensive knowledge on principles and modules of operating systems.

CO2- Understand key mechanisms in design of operating systems modules.

CO3- Understand process management, concurrent processes and threads, memory management, virtual memory concepts, deadlocks.

CO4- Compare performance of processor scheduling algorithms - produce algorithmic solutions to process synchronization problems.

Course Title: (Paper-IV) WEB TECHNOLOGY AND APPLICATION

Course Outcomes:

CO1- Analyze a web page and identify its elements and attributes.

CO2- Create web pages using XHTML and Cascading Style Sheets.

CO3- Build dynamic web pages using JavaScript (Client side programming).

CO4- Create XML documents and Schemas.

CO5- The focus in this course is on the World Wide Web as a platform for interactive applications, content publishing and social services. The development of web-

based applications requires knowledge about the underlying technology and the formats and standards the web is based upon.

Course Title: (Paper-V) RDBMS CONCEPTS & ORACLE
Course Outcomes:

CO1- Understand the importance of Database.
CO2- Understand the Architecture & Modeling of Database.
CO3- Understand the concept of RDBMS.
CO4- Learn brief introduction to Structured Query Language.
CO5- Learn and implement Backup and Recovery of databases.
CO6- Learn and implement the Database Security.
CO7- Design Commercial database applications.

Course Title: (Paper-VI) SOFTWARE ENGINEERING
Course Outcomes:

CO1- Understand the process of Software development.
CO2- Understand and plane the Software development.
CO3- Understand and implement the Coding.
CO4- Debug software.
CO5- Test software.

Course Title: (Paper-VII) ORGANIZATIONAL BEHAVIOUR
Course Outcomes: Students would be able to:

CO1- Discuss the development of the field of organizational behaviour and explain the micro and macro approaches
CO2- Analyze and compare different models used to explain individual behaviour related to motivation and rewards
CO3- Identify the processes used in developing communication and resolving conflicts.
CO4- to explain group dynamics and demonstrate skills required for working in groups (team building)
CO5- Identify the various leadership styles and the role of leaders in a decision making process.
CO6- Explain organizational culture and describe its dimensions and to examine various organizational designs
CO7- Discuss the implementation of organizational change.

BCA Third Year

Course Title: (Paper-I) Computer Network, Internet Technology and Security
Course Outcomes:

CO1- Learn basic terminologies of Networking.
CO2- Know about fundamentals of Information Security.
CO3- Know and analyze the security threats and vulnerabilities.

CO4- Learn and implement System & Network Administration and security.
CO5- Learn about tools and technologies used for Network security.
CO6- Understand the various layers of Network architecture.
CO7- Understand and implement the switching techniques.
CO8- Learn the need to create a Network.
CO9- Learn about different layers and protocols present in those layers.
CO10- Learn to configure the network devices.
CO11- Learn about IP -Addressing.
CO12- Learn about Network Security.

Course Title: (Paper-II) CORE JAVA
Course Outcomes:

CO1- Use an integrated development environment to write, compile, run, and test simple object-oriented Java programs.
CO2- Read and make elementary modifications to Java programs that solve real-world problems.
CO3- Validate input in a Java program.
CO4- Identify and fix defects and common security issues in code.
CO5- Document Java program using Java doc.
CO6- Use a version control system to track source code in a project.

Course Title: (Paper-III) MANAGEMENT INFORMATION SYSTEM (MIS)
Course Outcomes:

CO1- Relate the basic concepts and technologies used in the field of management information systems;
CO2- Compare the processes of developing and implementing information systems.
CO3- Outline the role of the ethical, social, and security issues of information systems.
CO4- Translate the role of information systems in organizations, the strategic management processes, with the implications for the management.
CO5- Apply the understanding of how various information systems like DBMS work together to accomplish the information objectives of an organization.

Course Title: (Paper-III) PYTHON PROGRAMMING
Course Outcomes:

CO1- Interpret the fundamental Python syntax and semantics and be fluent in the use of Python control flow statements.
CO2- Express proficiency in the handling of strings and functions.
CO3- Determine the methods to create and manipulate Python programs by utilizing the data structures like lists, dictionaries, tuples and sets.
CO4- Identify the commonly used operations involving file systems and regular expressions.
CO5- Articulate the Object-Oriented Programming concepts such as encapsulation, inheritance and polymorphism as used in Python.

Course Title: (Paper-IV) E-GOVERNANCE

Course Outcomes:

CO1- Enhanced Transparency and Accountability.
CO2- Expanded reach of Governance.
CO3- Improved Public Administration.
CO4- Enables Environment for Promoting Economic development.
CO5- Improved service delivery in the form of better access to information and quality services to citizens.
CO6- Inheritance and polymorphism as used in Python.

Course Title: (Paper-V) PRINCIPLES AND PRACTICES OF MANAGEMENT

Course Outcomes:

CO1- To study the functions and principles of management.
CO2- To learn the application of the principles in an organization.
CO3- To enable the effective and barriers communication in the organization.
CO4- To study the system and process of effective controlling in the organization.

DEPARTMENT OF BBA

Program Outcomes

- An Understanding of Business Functions
- Providing Global Perspectives
- Developing Critical and Analytical Thinking Abilities
- Interpersonal Skill Development
- Creating Social Sensitivity and Understanding CSR, Ethical and Sustainable
- Business Practices Demonstrate sensitivity to social, ethical and sustainability issues
- Developing Entrepreneurship Acumen.

Program Specific Outcomes

- Acquiring Conceptual Clarity of Various Functional Areas
- Ability to analyze various functional issues affecting the organization
- Demonstrating ability to evolve strategies for organizational benefits
- Analysis and interpretation of the data which is used in Decision Making
- Demonstrate the ability to develop models / frameworks to reflect critically on
- specific business contexts Demonstrate Effectively Oral and Written Communication
- Demonstrate Ability to work in Groups
- Demonstrate understanding of social cues and contexts in social interaction
- Develop Ethical Practices and Imbibe Values for Better Corporate Governance.
- Understand ethical challenges and choices in a business setting
- Demonstrate understanding of sustainability related concerns in varied areas

- Analyze Global Environment and its Impact on Business
- Understand the ecosystem of start up in the country
- Demonstrate the ability to create business plans

Course Outcome

BBA I Year

S.No	Class	Course Name	Course Outcomes
1	BBA I YEAR	Business Management (M1BBAA1T)Group 1	Students will get familiar with the basic concepts applied in contemporary management practice and many of the concepts learnt will form the foundation for subsequent courses in strategy.
2		Communication Skills (M1BBAA2T)Group 1	Students will be able to communicate their ideas through different modes and mediums. They will be able to make memorable presentations professionally. Students will understand different strategies to adopt while communicating with different personalities with different goals. Students will be able to handle job opportunities successfully
3		Money and Banking (A1RBAN1G) Elective	Understand several key models and concepts of monetary economics and banking theory. Understand simple articles concerned with monetary economics and banking theory. Apply to current events key models and concepts of monetary economics and banking theory. Appreciate the potential importance of monetary phenomenon in the economy.
4		Business statistics (M1BBAB21T)Group II	Students will be able to summarize and analyze statistical data to solve practical business related problems. Students will be able to interpret the relevance of statistical findings for business problem solving and decision making. Students will be able to apply technology to statistical analysis and problem solving.
5		Retail management (V1-COM-REMT) Vocational	Understand the Organized retail sector and its operations. Understand the various strategies involved with the retail sector. Learn how to deal with customers and understand their needs to sustain in the market. Understanding how to manage retail during crisis.

6		NCC Awareness Elective	Understand the organizational hierarchy of NCC. Understand the feeling of patriotism for motherland is evoked by the NCC song 'Hum sab bharatiya hain….' Assess the different functional bodies and their roles in the organization Appreciate the systematic organizational structure of NCC

BBA II Year

S.No.	Class	Course Name	Course Outcome
1	BBA II YEAR	Marketing Management (M2-BBAB1T) GROUP II MAJOR 1	Student will be able to identify the marketing process and its applicability in business operations. They will be able to communicate marketing information persuasively and accurately in oral, written and graphic formats. Differentiate between categories of consumer criteria for determining value. Recognizes how identify target markets and environments by analyzing demographics and consumer behavior. List best practices for responsible marketing and how to manage marketing efforts synthesize ideas into a business plan for entrepreneurial start-up venture. The student will be able to emphasis on various aspects of service marketing which make it different from goods marketing.
2		Marketing Research (M2-BBAB2T) GROUP II MAJOR II	Discuss the scope and managerial importance of market research and its role in the development marketing strategy. Provide a detailed overview of the stages in the market research process. Develop research question and objectives that can be addressed in a research design. Communicate research results in written report and oral presentation formats.

3		Organizational Behavior (M2-BBAA2T) GROUP I MINOR	Students will be able to know the organizational behavior, its importance and comparison of various theories of organizational behavior .This outcome of organizational behavior will introduce to several theories on management framework, role of managers, skills of managers and managers jobs. Examine the components and theories behind leadership, operand politics .They can analyze real situation where leadership, power and politics are illustrated positively and negatively. Analyze various stress management and coping strategies. Compare different organizational cultures, examine characteristics of culture, explore global implication and examine creating and sustaining a positive culture, and assessing the impact of culture on organizational behavior.
4		Advertising sales promotion and management (M2-ASPM2T) Personal selling and salesmanship Open Elective	The purpose of this course is to familiarize the student with the fundamentals of personal selling and the selling process. Student will be able to understand selling as a career and what it takes to be a successful salesman.
5		Digital marketing (V2-COM-DIGT) Vocational	Describe the challenging need of the society in the field of E-Commerce . Identify various activities and operations in the context of online transaction. Explain the steps in suffering E- Commerce websites. Describe various e-payment systems. Analyze security issues in E- Commerce.
6		NCC Awareness Elective	Understand the organizational hierarchy of NCC. Understand the feeling of patriotism for motherland is evoked by the NCC song 'Hum sab bharatiya hain….' Assess the different functional bodies and their roles in the organization Appreciate the systematic organizational. Structure of NCC.

BBA III Year

S.No.	Class	Course Name	Course Outcome
1	BBA III YEAR	Advertising and sales management (M3-BBAB1D) GROUP -B DSE 1 MAJOR 1	Students will be aware of developing and managing dynamic customers and business relationship. Students will be groomed with customer centric creative thinking and strong communication to be effective in the area of marketing and sales. Open up to the numerous future possibilities of higher education as well as of getting placed with reputed corporate in the country. Students will involve as highly innovative and committed professionals with strategic marketing and communication skills required for effective selling.

2		Consumer behavior (M3-BBAB1D) GROUP -B DSE 1 MAJOR 2	To create understanding about consumers behavior. To impact knowledge regarding process of decision making motivation and cultural influence. To familiarize students influence with opinion leadership and consumer protection.
3		Functional management (M3-BBAA2T) GROUP -A MINOR	Understand the concept of functional management. Understand the concept of Personal management. Understand the concept of Production management. Understand the concept of Marketing management. Understand the concept of Digital marketing. Understand the concept of need of business ethics in management.
4		Vocational	
5		Elective	
6			

VOCATIONAL COURSES

1} Office Procedure and Practices

After studying this course the student will be able to-

CO1- Understand office record keeping, record management and filing.

CO2- Understand about office forms, Register and the Mail Management.

CO3- Understand the Budget and Audit System in the office.

2} Retail Management-

After studying this course the student will be able to-

CO1- Understand the Fundamental Concept of Retail Management.

CO2- Understand E-Retailing System.

CO3- Understand E- Payment System.

3} Organic Farming-

After studying this course the student will be able to-

CO1- Prepare media for protected cultivation.

CO2- Demonstrate irrigation and fustigation, green house operations, irrigation and fustigation, care and maintenance of protected structure.

CO3- Demonstrate special horticultural practices in protected cultivation.

CO4- Identify and Control of insect-pest and diseases, harvest and post-harvest practices.

4} Desktop Publishing

After studying this course the student will be able to-

CO1- Understand basics of computer and its related terminology.

CO2- Understand various software used for desktop publishing and would be able to create and design documents with text and graphics like newspaper ad, wedding cards, visiting cards, greeting cards etc.

CO3- Write, Edit and Print documents using MS-WORD and EXCEL.

5} Nutrition and Dietetics-

After studying this course the student will be able to-

CO1- Understand the relationship between food nutrition and health.

CO2- Understand various function of food and food groups.

CO3- Understand importance of balanced diet to reduce risk of deficiency diseases.

6} Salesmanship-

After studying this course the student will be able to-

CO1- Understand basic selling techniques: Demonstrate effective selling skills

CO2- Provide students with the knowledge and skills necessary to enable them to perform adequately in any single functional area of sale management.

CO3- Help developing effective selling skills as required in the today's competitive industry.

7} Web Designing-

After studying this course the student will be able to-

CO1- Code a handful of useful HTML and CSS examples.

CO2- Build Semantic, HTML and CSS web page.

CO3- Write basic scripts.

8} Personality Development-

After studying this course the student will be able -

CO1- To cultivate skills for successful life and learn to handle failure.

CO2- To develop core skills for employability.

CO3- To develop effective communication skills.

NCC Awareness

01. The Student will develop a sense of responsibility & there by display sense of patriotism secular, values, discipline, improve learning.

02. To develop the quality of immediate & implicit obedience of good things.

03. This paper will enable the students to build & develop leadership through communication.

National Service Scheme

01. Understand the importance to having community problem & their solution. It might help in
job opportunity in some govt. approved NGOs & Ministry of youth affairs & sports.

02. The Student can carry out basic information about community, which in turn and be of great help in distance management fields.

Physical Education

01. Know the physical education system & sports better & may excel in this area in their personal, social & professional life.

02. The students will learn about the role of physical activity & sports for fitness & health etc.

Environmental Education

01. To understand various aspects of life forms, ecological processer & the impacts on them by the human during anthropogenic era.

02. To develop empathy for all life forms, awareness, responsibility toward environmental protection & nature preservation.

Yoga and Meditation

After studying this course, students will be able to:

Take care of their own Physical Mental emotional, social and spiritual health