



PG AND RESEARCH DEPARTMENT OF MATHEMATICS

POs, PSOs AND COs (2023-2024)

B.Sc. MATHEMATICS

PROGRAM OUTCOMES (PO's)

PO1: Disciplinary Knowledge: Capable of demonstrating comprehensive knowledge and understanding of one or more disciplines that form a part of an undergraduate programme of study.

PO2: Critical Thinking: Capability to apply analytic thought to a body of knowledge; analyse and evaluate evidence, arguments, claims, beliefs on the basis of empirical evidence; identify relevant assumptions or implications; formulate coherent arguments; critically evaluate practices, policies and theories by following scientific approach to knowledge development.

PO3: Problem Solving: Capacity to extrapolate from what one has learned and apply their competencies to solve different kinds of non-familiar problems, rather than replicate curriculum content knowledge; and apply one's learning to real life situations.

PO4: Analytical Reasoning: Ability to evaluate the reliability and relevance of evidence; identify logical flaws and holes in the arguments of others; analyze and synthesize data from a variety of sources; draw valid conclusions and support them with evidence and examples and addressing opposing viewpoints.

PO5: Scientific Reasoning: Ability to analyse, interpret and draw conclusions from quantitative/ qualitative data; and critically evaluate ideas, evidence, and experiences from an open minded and reasoned perspective.

PO6: Self-directed & Lifelong Learning: Ability to work independently, identify and manage a project. Ability to acquire knowledge and skills, including "learning how to learn", through self-placed and self-directed learning aimed at personal development, meeting economic, social and cultural objectives.

PROGRAMME SPECIFIC OUTCOMES

PSO1: Acquire good knowledge and understanding, to solve specific theoretical & applied problems in different area of mathematics & statistics.

PSO2: Understand, formulate, develop mathematical arguments, logically and use quantitative models to address issues arising in social sciences, business and other context /fields.

PSO3: To prepare the students who will demonstrate respectful engagement with other's ideas, behaviors, beliefs and apply diverse frames of references to decisions and actions. To create effective entrepreneurs by enhancing their critical thinking, problem solving, decision making and leadership skill that will facilitate startups and high potential organizations

COURSE OUTCOMES

SEMESTER I

COURSE: ALGEBRA AND TRIGONOMETRY (CORE PAPER)

CREDIT:5

CLO 1: Classify and Solve reciprocal equations

CLO 2: Find the sum of binomial, exponential and logarithmic series

CLO 3: Find Eigen values, eigen vectors, verify Cayley – Hamilton theorem and diagonalize a given matrix

CLO 4: Expand the powers and multiples of trigonometric functions in terms of sine and cosine

CLO 5: Determine relationship between circular and hyperbolic functions and the summation of trigonometric series

COURSE: DIFFERENTIAL CALCULUS (CORE PAPER)

CREDIT:5

CLO 1: Find the nth derivative, form equations involving derivatives and apply Leibnitz formula

CLO 2: Find the partial derivative and total derivative coefficient

CLO 3: Determine maxima and minima of functions of two variables and to use the Lagrange's method of undetermined multipliers

CLO 4: Find the envelope of a given family of curves

CLO 5: Find the evolutes and involutes and to find the radius of curvature using polar coordinate

COURSE: NUMERICAL METHODS WITH APPLICATIONS I (ELECTIVE) CREDIT:3

CLO1: After studied unit -1, the student will be able to solve Iteration method- Regula- falsi method- Newton-Raphson method.

CLO2: After studied unit -2, the student will be able to calculate interpolation values by applying Gauss-Elimination method, Gauss-Jordan method.

CLO3: After studied unit -3, the student will be able to calculate Differences of a Polynomial-Factorial polynomials- inverse operator Δ^{-1} -Summation Series.

CLO4: After studied unit -4, the student will be able to estimate one or more missing terms of the given set of data.

CLO5: After studied unit -5, the student will be able to estimate the interpolation value for unequal intervals based on Lagrange's formula of inverse interpolation

COURSE: MATHEMATICS FOR COMPETITIVE EXAMINATIONS-I(ELECTIVE)

CREDIT:2

CLO1: Solve Mathematical Problems using Mathematical formulae

CLO2: Understand the knowledge of application of Mathematics

CLO3: Understand the concepts of simplification.

CLO4: Calculate the square root and cube root.

CLO5: Solve the problems on age.

COURSE: BRIDGE MATHEMATICS (FOUNDATION 1)

CREDIT:2

CLO 1: Prove the binomial theorem and apply it to find the expansions of any $(x + y)^n$ and also, solve the related problems

CLO 2: Find the various sequences and series and solve the problems related to them. Explain the principle of counting.

CLO 3: Find the number of permutations and combinations in different cases. Apply the principle of counting to solve the problems on permutations and combinations

CLO 4: Explain various trigonometric ratios and find them for different angles, including sum of the angles, multiple and submultiple angles, etc. Also, they can solve the problems using the transformations.

CLO 5: Find the limit and derivative of a function at a point, the definite and indefinite integral of a function. Find the points of min/max of a function.

SEMESTER II

COURSE: ANALYTICAL GEOMETRY (CORE PAPER)

CREDIT:5

CLO1: Understand and apply the concept of homogeneous equations of second degree to represent straight lines in different forms.

CLO2: Derive polar equations for straight lines, circles, and conic sections, and analyze their geometric properties.

CLO3: Formulate general equations of planes, calculate angles between two planes, and determine perpendicular distances.

CLO4: Calculate the angle between a line and a plane, determine the length of perpendiculars, and analyze coplanar and skew lines.

CLO5: Formulate equations of spheres, determine lengths of tangents, and analyze sections of spheres.

COURSE: INTEGRAL CALCULUS(CORE PAPER)

CREDIT:5

CLO 1: Determine the integrals of algebraic, trigonometric and logarithmic functions and to find the reduction formulae

CLO 2: Evaluate double and triple integrals and problems using change of order of integration

CLO 3: Solve multiple integrals and to find the areas of curved surfaces and volumes of solids of revolution

CLO 4: Explain beta and gamma functions and to use them in solving problems of integration

CLO 5: Explain Geometric and Physical applications of integral calculus.

COURSE: NUMERICAL METHODS WITH APPLICATIONS II (ELECTIVE) CREDIT:3

- CLO1:** After studied unit -1, the student will be able to evaluate derivatives by applying Newton's forward and backward differences formulae.
- CLO2:** After studied unit -2, the student will be able to evaluate integrations by applying the trapezoidal rule, Simpson's rules, and Weddle's rule.
- CLO3:** After studied unit -3, the student will be able to find a complete solution to linear difference equations.
- CLO4:** After studied unit -4, the student will be able to estimate approximate numerical solutions of ordinary differential equations by Euler, Picard and Taylor.
- CLO5:** After studied unit -5, the student will be able to estimate approximate numerical solutions of ordinary differential equations by Runge-Kutta methods.

SEMESTER III

COURSE: VECTOR CALCULUS (CORE PAPER) CREDIT:5

- CLO1:** Find the derivative of vector and sum of vectors, product of scalar and vector point function and to determine derivatives of scalar and vector products
- CLO 2:** Applications of the operator 'del' and to Explain solenoidal and irrotational vectors
- CLO 3:** Solve simple line integrals
- CLO 4:** Solve surface integrals and volume integrals
- CLO 5:** Verify the theorems of Gauss, Stoke's and Green's (Two Dimension)

COURSE: DIFFERENTIAL EQUATIONS (CORE PAPER) CREDIT:5

- CLO 1:** Determine solutions of homogeneous equations, non-homogeneous equations of degree one in two variables, solve Bernoulli's equations and exact differential equations
- CLO 2:** Find the solutions of equations of first order but not of higher degree and to Determine particular integrals of algebraic, exponential, trigonometric functions and their products
- CLO 3:** Find solutions of simultaneous linear differential equations, linear equations of second order and to find solutions using the method of variations of parameters
- CLO 4:** Form a PDE by eliminating arbitrary constants and arbitrary functions, find complete, singular and general integrals, to solve Lagrange's equations
- CLO 5:** Explain standard forms and Solve Differential equations using Charpit's method.

COURSE: MATHEMATICAL STATISTICS I (ELECTIVE) CREDIT:3

- CLO1:** Acquire the knowledge of basic concepts in statistics
- CLO2:** Be able to understand various types of random variables and the distributions
- CLO3:** Calculate moments, cumulants, moment generating function and various constants of probability distributions
- CLO4:** Illustrate the theory of random variables, distribution functions and probability distributions with suitable
- CLO5:** Be able to evaluate solution of real-life problems under the concept Of probability and probability distributions.

SEMESTER IV

COURSE: OPTIMIZATION TECHNIQUES (CORE PAPER)

CREDIT:5

- CLO1:** Describe the concepts involved in solving linear programming problems which are widely used in business operations.
- CLO2:** Apply mathematical techniques used in optimizing transportation and assignment problems.
- CLO3:** Solve job sequencing problems.
- CLO4:** Breakdown different inventory models
- CLO5:** Evaluate PERT, CPM problems and develop applications

COURSE : ELEMENTS OF MATHEMATICAL ANALYSIS

CREDIT:5

- CLO 1:** Explain in detail about sets and functions, equivalence and countability and the LUB axiom
- CLO 2:** Explain Sequence and Subsequence of real numbers and to find the limit of sequence to test for convergent, divergent, bounded and monotone sequences
- CLO 3:** Explain the operations on convergent and divergent sequences and to Explain the concepts of limit superior and limit inferior and the notion of Cauchy sequences
- CLO 4:** Classify the series of real numbers and the alternating series and their convergence and divergence, the conditional convergence and absolute convergence and solve problems on convergence of the sequences
- CLO 5:** Explain about the metric spaces and functions continuous on a Metric space

COURSE: MATHEMATICAL STATISTICS II (ELECTIVE)

CREDIT:3

- CLO 1:** Recognize the parameters and statistics to test the significance of sampling
- CLO 2:** Finding the Goodness of Fit
- CLO 3:** Derive the various measures of Chi-square, t and F distributions
- CLO 4:** Correlation coefficients between Observed and Estimated values
- CLO 5:** Analyse the Regression lines

SEMESTER V

COURSE : ABSTRACT ALGEBRA (CORE PAPER)

CREDIT:4

- CLO 1:** Explain groups, subgroups and cyclic groups
- CLO 2:** Explain about Normal subgroup, Quotient groups, Homomorphisms and Automorphisms and verify the functions for homomorphism and automorphism properties
- CLO 3:** Explain Permutation groups and apply Cayley's theorem to problems
- CLO 4:** Explain Rings, Ideals and Quotient Rings and examine their structure
- CLO 5:** Discuss about the field of quotient of an integral domain and to Explain in detail about Euclidean Rings

COURSE: REAL ANALYSIS (CORE PAPER)

CREDIT:4

- CLO 1:** Explain the concepts of Continuous and Discontinuous functions, open and close sets, Connectedness, Completeness and Compactness
- CLO 2:** Explain the concepts of bounded and totally bounded sets, continuity of inverse functions and Uniform continuity

CLO 3: Define the sets of measure zero, to Explain about the existence and properties of Riemann integral

CLO 4: Explain the concept of differentiability and to Explain Rolle's theorem, Law of mean, and Fundamental theorem of calculus

CLO 5: Explain the point wise and uniform convergence of sequence of function and to derive the Taylor's theorem

COURSE: MATHEMATICAL MODELLING (COREPAPER)

CREDIT:4

CLO 1: Explain simple situations requiring Mathematical Modelling and to Determine the characteristics of such models

CLO 2: Model using differential equations in-terms of linear growth and Decay models

CLO 3: Model using systems of ordinary differential equations of first order, to discuss about various models under the categories 'Epidemics' and 'Medicine'

CLO 4: Explain in detail about difference equations

CLO 5: Model using difference equations

COURSE: TRANSFORM TECHNIQUES (ELECTIVE) CREDIT:3

CLO1: Find the Laplace Transform and evaluation of integrals using Laplace Transform

CLO2: Find the Inverse Laplace Transforms

CLO3: Expansion of Periodic Functions of Period 2π , Expansion of Odd and Even Functions

CLO4: Find the Fourier Transforms, Infinite Fourier Transforms and their properties

CLO 5: Evaluate Fourier sine and cosine transform.

SEMESTER-VI

COURSE: LINEAR ALGEBRA (CORE PAPER)

CREDIT:4

CLO 1: Acquire a detailed knowledge about vector spaces and subspaces

CLO 2: Explain the concepts of Linear Dependence, Linear Independence, Bases and Dimension of basis

CLO 3: Explain the concept of Linear Transformations, their Matrix representation and the notion of dual spaces

CLO 4: Find the Eigen values and Eigen vectors, to apply the concepts for diagonalisation

CLO5: Explain about Inner product and norms and to apply Gram Schmidt

Orthogonalization Process to problems on inner product spaces

COURSE: COMPLEXANALYSIS (CORE PAPER)

CREDIT:4

CLO 1: Explain about analytic functions, their differentiation and continuity and to verify the Harmonic functions using analyticity conditions

CLO 2: Explain the concept of Conformal mappings and mappings by linear transformations and linear fractional transformations

CLO 3: Explain about the integrations of functions over simply and multiply connected domains and to derive the Cauchy integral formula, Liouville's theorem, Fundamental theorem of Algebra and Maximum Module Principle

CLO 4: Find the convergence the sequences and series, to derive Taylor's and Laurent's series
CLO 5: Find the nature of singularities, to find the residue of a given function at a given singular point, to Explain about zeros and poles and to evaluate real improper integrals (Excluding poles on the real axis)

COURSE:MECHANICS (CORE PAPER)

CREDIT:4

CREDIT:4 CLO 1: Define Resultant, Component of a Force, Coplanar forces, like and unlike parallel forces, Equilibrium of a Particle, Limiting equilibrium of a particle on an inclined plane.

CLO 2: Define Moment of a force and Couple with examples. Define Parallel Forces and Forces acting along a Triangle, Solve problems on frictional forces

CLO 3: Define work, energy, power, rectilinear motions under varying forces. Define Simple Harmonic Motion and find its Geometrical representation.

CLO 4: Define Projectile, impulse, impact and laws of impact. Prove that the path of a projectile is a parabola. Find the direct and oblique impact of smooth elastic spheres

CLO 5: Define central orbits, explain conic as centered orbits and solve problems related to central orbits

COURSE: PROGRAMMING CONCEPTS USING C++ CREDIT:3

CO1: Remember the program structure of C with its syntax and semantics

CO2: Understand the programming principles in C (data types, operators, branching and looping, arrays, functions, structures, pointers and files)

CO3: Apply the programming principles learnt in real-time problems

CO4: Analyze the various methods of solving a problem and choose the best method

CO5: Code, debug and test the programs with appropriate test cases

COURSE:DISCRETE MATHEMATICS (ELECTIVE PAPER)

CREDIT:3

CO1 Analyse and perceive various graph theoretic concepts and familiarize with their applications.

CO2 Describe about partially ordered sets, Boolean algebra, lattices and their types.

CO3 Apply Karnaugh map for simplifying the Boolean expression

CO4 Demonstrate the skill to construct simple mathematical proofs and to validate.

CO5 Achieve greater accuracy, clarity of thought and language.



PG AND RESEARCH DEPARTMENT OF MATHEMATICS

POs, PSOs AND COs (2023-2024)

M.Sc., MATHEMATICS

PROGRAM OUTCOMES

PO1: Problem Solving Skill

Apply knowledge of Management theories and Human Resource practices to solve business problems through research in Global context.

PO2: Decision Making Skill

Foster analytical and critical thinking abilities for data-based decision-making.

PO3: Ethical Value

Ability to incorporate quality, ethical and legal value-based perspectives to all organizational activities.

PO4: Communication Skill

Ability to develop communication, managerial and interpersonal skills.

PO5: Individual and Team Leadership Skill

Capability to lead themselves and the team to achieve organizational goals.

PO6: Employability Skill

Inculcate contemporary business practices to enhance employability skills in the competitive environment.

PO7: Entrepreneurial Skill

Equip with skills and competencies to become an entrepreneur.

PO8: Contribution to Society

Succeed in career endeavors and contribute significantly to society.

PO 9: Multicultural competence

Possess knowledge of the values and beliefs of multiple cultures and a global perspective.

PO 10: Moral and ethical awareness/reasoning

Ability to embrace moral/ethical values in conducting one's life

PROGRAMME SPECIFIC OUTCOMES

PSO1: Acquire good knowledge and understanding, to solve specific theoretical & applied problems in different area of mathematics & statistics.

PSO2: Understand, formulate, develop mathematical arguments, logically and use quantitative models to address issues arising in social sciences, business and other context /fields.

PSO3: To prepare the students who will demonstrate respectful engagement with other's ideas, behaviors, beliefs and apply diverse frames of references to decisions and actions.

COURSE OUTCOMES

COURSE: ALGEBRAIC STRUCTURES (CORE PAPER)

CREDIT:5

CLO 1: Recall basic counting principle, define class equations to solve problems, explain Sylow's theorems and apply the theorem to find number of Sylow subgroups

CLO 2: Define Solvable groups, define direct products, examine the properties of finite abelian groups, define modules

CLO 3: Define similar Transformations, define invariant subspace, explore the properties of triangular matrix, to find the index of nilpotence to decompose a space into invariant subspaces, to find invariants of linear transformation, to explore the properties of nilpotent transformation relating nilpotence with invariants.

CLO 4: Define Jordan, canonical form, Jordan blocks, define rational canonical form, define companion matrix of polynomial, find the elementary devices of transformation, apply the concepts to find characteristic polynomial of linear transformation.

CLO 5: Define trace, define transpose of a matrix, explain the properties of trace and transpose, to find trace, to find transpose of matrix, to prove Jacobson lemma using the triangular form, define symmetric matrix, skew symmetric matrix, adjoint, to define Hermitian, unitary, normal transformations and to verify whether the transformation in Hermitian, unitary and normal

COURSE: REAL ANALYSIS I (CORE PAPER)

CREDIT:5

CLO1: Analyze and evaluate functions of bounded variation and Rectifiable Curves.

CLO2: Describe the concept of Riemann-Stieltjes integral and its properties.

CLO3: Demonstrate the concept of step function, upper function, Lebesgue function and their integrals.

- CLO4:** Construct various mathematical proofs using the properties of Lebesgue integrals and establish the Levi monotone convergence theorem.
- CLO5:** Formulate the concept and properties of inner products, norms and measurable functions.

COURSE: ORDINARY DIFFERENTIAL EQUATIONS (CORE PAPER)

CREDIT:4

- CLO1:** Establish the qualitative behavior of solutions of systems of differential equations .
- CLO2:** Recognize the physical phenomena modeled by differential equations and dynamical systems.
- CLO3:** Analyze solutions using appropriate methods and give examples.
- CLO4:** Formulate Green's function for boundary value problems.
- CLO5:** Understand and use various theoretical ideas and results that underlie the mathematics in this course.

COURSE: DISCRETE MATHEMATICS (CORE PAPER) CREDIT:3

- CLO1:** Know the algebraic structures of lattices and Boolean algebra, and sketch the minimization of Boolean polynomials.
- CLO2:** Model the switching circuits with applications.
- CLO3:** Understand the finite fields and its mathematics properties.
- CLO4:** Acquire the notions of the polynomials over finite fields, Irreducibility and factorization of polynomials.
- CLO5:** Apply the coding theory with the linear and cyclic codes in cryptography.

COURSE: GRAPH THEORY AND APPLICATIONS CREDIT:3

- CLO1:** Grasp features and properties of various types of graphs.
- CLO2:** Demonstrate capacity of illustration for mathematical reasoning through analyzing, providing and explaining concepts of Eulerian circuits and Hamiltonicity in graphs.
- CLO3:** Understand the definitions and properties of matching and independent sets.
- CLO4:** Apply the concepts of graphs to model them in real life situations.
- CLO5:** Explicate the applications of planarity and colorability..

SEMESTER II

COURSE: ADVANCED ALGEBRA (CORE PAPER) CREDIT:5

- CLO1:** Prove theorems applying algebraic ways of thinking.
- CLO2:** Connect groups with graphs and understanding about Hamiltonian graphs.
- CLO3:** Compose clear and accurate proofs using the concepts of Galois Theory.
- CLO4:** Bring out insight into Abstract Algebra with focus on axiomatic theories.
- CLO5:** Demonstrate knowledge and understanding of fundamental concepts including extension fields, Algebraic extensions, Finite fields, Class equations and Sylow's theorem.

COURSE: REAL ANALYSIS II(CORE PAPER)

CREDIT:5

CLO1: Understand and describe the basic concepts of Fourier series and Fourier integrals with respect to orthogonal system.

CLO2: Analyze the representation and convergence problems of Fourier series.

CLO3: Analyze and evaluate the difference between transforms of various functions.

CLO4: Formulate and evaluate complex contour integrals directly and by the fundamental theorem.

CLO5: Apply the Cauchy integral theorem in its various versions to compute contour integration.

COURSE: PARTIAL DIFFERENTIAL EQUATIONS (CORE PAPER)

CREDIT:4

CLO1: To understand and classify second order equations and find general solutions

CLO2: To analyse and solve wave equations in different polar coordinates

CLO3: To solve Vibrating string problem, Heat conduction problem, to identify and solve Laplace and beam equations

CLO4: To apply maximum and minimum principle's and solve Dirichlet, Neumann problems for various boundary conditions

CLO5: To apply Green's function and solve Dirichlet, Laplace problems, to apply Helmholtz operation and to solve Higher dimensional problem.

COURSE: TENSOR ANALYSIS AND RELATIVITY (ELECTIVE)

CREDIT:3

CLO1: Understand the system of different orders in Tensor Algebra.

CLO2: Explain about Tensor Calculus in Riemann spaces.

CLO3: Understand the concept of Covariant of differentiation and intrinsic differentiation

CLO4: Explain about the theory of relativity and Doppler effect.

CLO5: Analyze about the conservation of mass and energy.

COURSE: DIFFERENCE EQUATIONS (ELECTIVE) CREDIT:3

CLO 1: Solve problems on Linear Difference Equations of Higher order.

CLO 2: Understand the system of Linear Difference Equation

CLO 3: Apply Z- transform techniques in difference equations.

CLO 4: Explain on Oscillation Theory.

CLO 5: Discuss on Asymptotic Behavior of Difference Equation.

SEMESTER III

COURSE: COMPLEX ANALYSIS (CORE PAPER)

CREDIT:5

CLO1: Analyze and evaluate local properties of analytical functions and definite integrals.

CLO2: Describe the concept of definite integral and harmonic functions.

CLO3: Demonstrate the concept of the general form of Cauchy's theorem

CLO4: Develop Taylor and Laurent series .

CLO5 Explain the infinite products, canonical products and Jensen's formula .

COURSE: PROBABILITY THEORY (CORE PAPER)

CREDIT:5

CLO1: To define Random Events, Random Variables, to describe Probability, to apply Bayes, to define Distribution Function, to find Joint Distribution function, to find Marginal Distribution and Conditional Distribution function, to solve functions on random variables.

CLO2: To define Expectation, Moments and Chebyshev Inequality, to solve Regression of the first and second types.

CLO3: To define Characteristic functions, to define distribution function, to find probability generating functions, to solve problems applying characteristic functions

CLO4: To define One point, two-point, Binomial distributions, to solve problems of Hypergeometric and Poisson distributions, to define Uniform, normal, gamma, Beta distributions, to solve problems on Cauchy and Laplace distributions

CLO5: To discuss Stochastic convergence, Bernoulli law of large numbers, to elaborate Convergence of sequence of distribution functions, to prove Levy-Cramer Theorems and de Moivre-Laplace Theorems, to explain Poisson, Chebyshev, Khintchine Weak law of large numbers, to explain and solve problems on Kolmogorov Inequality and Kolmogorov Strong Law of large numbers.

COURSE: TOPOLOGY (CORE PAPER)

CREDIT:5

CLO1: Define and illustrate the concept of topological spaces and the basic definitions of open sets, neighbourhood, interior, exterior, closure and their axioms for defining topological space.

CLO2: Understand continuity, compactness, connectedness, homeomorphism and topological properties.

CLO3: Analyze and apply the topological concepts in Functional Analysis.

CLO4: Ability to determine that a given point in a topological space is either a limit point or not for a given subset of a topological space.

CLO5: Develop qualitative tools to characterize connectedness, compactness, second countable, Hausdorff and develop tools to identify when two are equivalent(homeomorphic).

COURSE: MECHANICS (CORE PAPER)

CREDIT:4

CLO1: Explain the basic concepts of mechanical systems under generalized coordinate systems.

CLO2: Identify the Lagrange's equations and its application. Identify the Lagrange's equations and its application.

CLO3: Derive the Hamilton Equation.

CLO4: Analyze the Hamilton's Principle and Hamilton-Jacobi Equation and separability.

CLO5: Discuss the Lagrange and Poisson brackets.

COURSE: FLUID DYNAMICS (ELECTIVE)

CREDIT:4

CLO1: Understand the concepts of kinematics of fluids in motions.

CLO2: Find the pressure at a point in a moving fluid.

CLO3: Discuss Stokes stream function.

CLO4: Analyse complex velocity potential for two dimensional flows.

CLO5: Derive the Navier – Stokes equations of motion of a Viscous fluid

SEMESTER IV

COURSE: FUNCTIONAL ANALYSIS (CORE PAPER)

CREDIT:5

CLO1: Understand the Banach spaces and Transformations on Banach Spaces.

CLO2: Prove Hahn Banach theorem and open mapping theorem.

CLO3: Describe operators and fundamental theorems.

CLO4: Validate orthogonal and orthonormal sets.

CLO5: Analyze and establish the regular and singular elements.

COURSE: DIFFERENTIAL GEOMETRY (CORE PAPER)

CREDIT:5

CLO1: Explain space curves, Curves between surfaces, metrics on a surface, fundamental form of a surface and Geodesics.

CLO2: Evaluate these concepts with related examples.

CLO3: Compose problems on geodesics.

CLO4: Recognize applicability of developable.

CLO5: Construct and analyze the problems on curvature and minimal surfaces

