COURSE OUTCOMES OF MATHEMATICS

I-YEAR SEMESTER- I PAPER- I

Course Title:Differential calculus

On Completion of this course the students will be able to:

- ✓ Explain the relationship between the derivative of a function as a function and the notion of the derivative as the slope of the tangent line to a function at a point.
- ✓ Compare and contrast the ideas of continuity and differentiability.
- ✓ To inculcate to solve algebraic equations and inequalities involving the sequence root and modulus function
- ✓ To able to calculate limits in inderminate forms by a repeated use of L' Hospital rule.
- ✓ To know the claim rule and use it to find derivatives of composite functions.
- ✓ To find maxima and minima, critical points and inflection points of functions and to determine the concarity of curves.
- ✓ To able to evaluate integrals of rational functions by partial fractions.

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I-YEAR SEMESTER-II PAPER-II

Course Title:Differential Equations

On successful completion of the course, Students will be able to:

- ✓ The main aim of the course is to introduce the students to the technique of solving various problems of engineering and science
- ✓ Distinguish between linear, nonlinear, partial and ordinary differential equations.
- ✓ Solve basic application problems described by second order linear differential equations with constant coefficients.
- ✓ Find power series solutions about ordinary points and singular points.
- ✓ Find the transforms of derivatives and integrals.
- ✓ Obtain an approximate set of solution function values to a second order boundary value problem using a finite difference equation.
- ✓ Solve a homogeneous linear system by the eigenvalue method.
- ✓ Obtain an approximate set of solution function values to a second order boundary value problem using a finite difference equation.

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II-YEAR SEMESTER-III PAPER-III

Course Title:Real Analysis

After completing the course students are expected to be able to:

- ✓ Describe the basic difference between the rational and real numbers.
- ✓ Give the difination of concepts related to metric spaces such as continuity , compactness, convergent etc.
- ✓ Give the essence of the proof of bolzanoweistrass theorem the contraction theorem as well as existence of convergent subsequence using equicontinuity.
- ✓ Evaluate the limits of wide class of real sequences.
- ✓ Determine whether or not real series are convergent by comparision with standard series or using the ratio test.
- ✓ Understand and perform simple proofs.
- ✓ Students will be able to demonstrate basic knowledge of key topics in classical real analysis.
- ✓ The course pervious the basic for further studies with in function analysis, topology & function Theory.

II-YEAR SEMESTER-IV PAPER-IV

Course Title:Abstract Algebra

After completing the course students are expected to be able to:

- ✓ Learn about the fundamentals concept of Groups, Sub groups, normal
- ✓ subgroups, isomorphism theorems, Cyclic and permutations groups
- ✓ To classify numbers into number sets
- ✓ To combine Polynomial by Addition or Subtraction
- ✓ To Solve problems of simple inequalities
- ✓ Interpret basic absolute value Expression
- ✓ To simplify algebraic expression using the commutative, Associative and distributive Properties

III-YEAR SEMESTER-V PAPER-V

COURSE TITLE:LINEAR ALGEBRA

After completing the course students are expected to be able to:

- ✓ Define vector space and subspace
- ✓ Understand the concept of base and dimension of the vectorspace
- ✓ Understand algebraic and geometric representations of vectors
- ✓ Describes coordinates of a vector relative to a given basis
- ✓ Discuss spanning sets s for vectors
- ✓ Use characteristic polynomial to compute eigenvalues and eigen vectors
- ✓ Explain the relationship between the row space and column space of a matrix
- ✓ Recognize and use basic properties of subspaces and vector space

COURSE TITLE:SOLID GEOMETRY PAPER:VI(A)

After completing the course students are expected to be able to:

- ✓ To understand geometrical terminology for sphere,cones,concoid and cylinder.
- ✓ Able to recognize line and rotational symmetries.
- ✓ Use geometric results to determine unknown angles.
- ✓ Get basic knowledge about circle, cone ,sphere , concoid and cylinder.
- ✓ Understand the concepts and advance topics related to two and three dimensional geometry.
- ✓ Find the area of triangles, quadrilaterals and circles and shapes based on these.

SEMESTER:VI **PAPER:VII**

COURSE TITLE:NUMERICAL ANALYSIS

After completing the course students are expected to be able to:

- ✓ The theoretical and practical aspects of the use of numerical analysis.
- ✓ Proficient in implementing numerical methods for a variety of multidisciplinary applications.
- ✓ To establish the limitations, advantages,and disadvantages of numerical analysis.
- ✓ To derive numerical methods for various mathematical operations and tasks, such 5.As interpolation, differentiation,integration, the solution of linear and non linear equations, and the solution of differential equations.
- ✓ To understand of common numerical analysis and how they are used to obtain approximate solution to otherwise intractable mathematical problems.
- ✓ To understand appropriate numerical methods to solve probability based problems.

SEMESTER:VI **PAPER:VIII(A)**

COURSE TITLE:VECTOR CALCULUS

After completing the course students are expected to be able to:

- ✓ Define vector equations for lines and planes
- ✓ Compute limits or derivatives of functions of two and three variables
- ✓ Analyze vector functions to find limits,derivatives and integrals
- ✓ Determine gradient vector fields and find potential function
- ✓ Apply fundamental theorem of line integrals,green,s and divergence theorem to evaluate integrals
- ✓ Compute partial derivatives,derivatives of vector valued function and gradient functions
- ✓ Calculate directional derivatives and gradient
- ✓ Explain the concept of conservative vector field and describes applications to physics

Course Title	HPW
Linear Algebra and Vector Calculus	3T+3P

III- YEAR PAPER III [ANNUAL]

On successful completion of the course, students will be able to:

- ✓ Understand the combination of two important aspects of modern mathematics via **Linear Algebra** and **Vector Calculus.**
- ✓ Linear Algebra emphasizes the concept of vector spaces and linear transformations which are essential in simplifying various scientific problems.
- ✓ It aims at inculcating problem solving skills within students to enable them compute large linear systems.
- ✓ The practical applications of "Linear Algebra" are in demography, archaeology, electrical engineering, fractal geometry and traffic analysis.
- ✓ Vector calculus motivates the study of vector differentiation and integration in two and three dimensional spaces.
- ✓ It is widely accepted as a prerequisite in various fields of science and engineering.
- ✓ It offers important tools for understanding functions (both real & complex) non-Euclidean geometry and topology.
- ✓ These tools are employed successfully in different branches of engineering and physics (such as electromagnetic fields, fluid flow and gravitational fields).

Course Title	HPW
Numerical Analysis	3T+3P

III- YEAR PAPER IV [ANNUAL]

On successful completion of the course, students will be able to:

- ✓ Solve an algebraic or transcendental equation using an appropriate numerical method
- ✓ Approximate a function using an appropriate numerical method.
- ✓ 3.Solve a differential equation using an approximate numerical method
- ✓ Evaluate a derivative at a value using an appropriate numerical method
- ✓ Solve a linear system of equations using an appropriate numerical method
- ✓ Perform an error analysis for a given numerical method
- ✓ Prove results for numerical root finding methods
- ✓ Calculate a definite integral using an appropriate numerical method
- ✓ Code a numerical method in a modern computer language.

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