COURSE OUTCOMES OF MATHEMATICS

I-YEAR SEMESTER- I PAPER- I

Code	Course Title	HPW
BS104	Differential calculus	4T+2P

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.

****

I-YEAR SEMESTER-II PAPER-II

Code	Course Title	HPW
BS204	Differential Equations	4T+2P

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.

****

II-YEAR SEMESTER-III PAPER-III

Code	Course Title	HPW
BS304	Real Analysis	4T+2P

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.

****

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.

****