BSc Mathematics

Programme Outcomes

1. PO 1 – Critical thinking
2. PO 2 – Problem Solving
3. PO 3 – Computational thinking

Programme Specific Outcomes

1. PSO 1 – Students will be able to attain the ability to identify, formulate and Solve challenging problems in Mathematics.
2. PSO 2 – Students will be able to work individually or as team member or Leader.
3. PSO 3 – Students will develop a confidence in Mathematics.
4. PSO 4 – Students will get an in – depth knowledge in theoretical Mathematics.
5. PSO 5 – Students will be able to analyse complex problems in Mathematics and propose solutions using research-based knowledge.

Course Outcomes

SEMESTER – 1

CORE - MATHEMATICS

MTS1B01 Basic Logic & Number Theory

- ➤ CO 1: - Students will be able to understand the theory and method of solutions of LDE.
- ➤ CO 2: - Students will be able to understand the theory of congruence and a few applications.
- ➤ CO 3: - Students will be able to solve linear congruent equations.

COMPLEMENTARY – MATHEMATICS

MT1C01 – Mathematics – 1

- ➤ CO 1: - Students will be able to understand the concepts limits and continuity
- ➤ CO 2: - Students will be able to aware application of derivatives
- ➤ CO 3: - Students will be able to know about application of integrals

COMPLEMENTARY – STATISTICS

ST1C01 Basic statistics and probability

- ➢ CO 1: - Students will be able to do basic analysis of data and represent it in a graphical way
- ➢ CO 2: - Students will be to solve the correlation and regression problems
- ➢ CO 3: - Students will be able to understand various approaches to probability and computer probabilities

SEMESTER – 2

CORE – MATHEMATICS

1. MTS2B02 Calculus of Single Variable – 1

- ➢ CO 1: -Students will be able to understand the fundamental ideas of limit, continuity and differentiability
- ➢ CO 2: -Students will be able to understand some basic theorems of differential calculus

COMPLEMENTARY – MATHEMATICS

MT2C02 – Mathematics – II

- ➢ CO 1: - Students will be able to know about vector space
- ➢ CO 2: - Students will be able to do convergent and divergent
- ➢ CO 3: - Students will be able to understand the concept of hyperbolic function

COMPLEMENTARY – STATISTICS

ST2C02 – Probability distributions

- ➢ CO 1: - Students will be able to understand the applications of theoretical distributions
- ➢ CO 2: - Students will be able to understand the concept of mathematical expectation

SEMESTER – 3

<u>CORE - MATHEMATICS</u>

2. MTS3B03 Calculus of Single Variable – 2

- ➢ CO 1: - Students will be able to understand the idea of improper integrals, their convergence and evaluation.
- ➢ CO 2: - Students will be able to understand to the idea of power series
- ➢ CO 3: - Students will be able to understand the idea of parameterization of curves

<u>SEMESTER – 4</u>

CORE - MATHEMATICS

3. MTS4B04 Linear Algebra
   - ➢ CO 1: - Students will be able to understand some basic matrix transformations in the R2 and R3, having interest in the field of computer graphics, engineering and physics are studied by specially pinpointing to their geometric effect

COMPLEMENTARY – MATHEMATICS

MTS4C04 Mathematics IV

- ➢ CO 1: - Students will be able to know ordinary differential equations
- ➢ CO 2: - Students will be able to understand Laplace Transforms
- ➢ CO 3: - Students will be able to understand the Fourier Series

COMPLEMENTARY – STATISTICS

ST4C04 Applied Statistics

- ➢ CO 1: - Students will be able to construct one way and two way ANOVA tables

- CO 2: - Students will be able to find trend values and to draw trend line
- CO 3: - Students will be able to understand the concept of quality control

SEMESTER – 5

CORE - MATHEMATICS

4. MTS5B05 Theory of Equations and Abstract Algebra
   - CO 1: -Students will be able to understand the formula to solve the third- and fourth-degree polynomial equations by Carden and Ferrari respectively.
   - CO 2: - Students will be able to understand the theory known as Galois theory to solve the famous problem of insolvability of quintic.
   - CO 3: - Students will be able to understand the abstract notion of a group

5. MTS5B06 Basic Analysis
   - CO 1: - Students will be able to know about sequences, their limits, several basic and important theorems involving sequences and their applications
   - CO 2: -Students will be able to understand some basic topological properties of real number system such as the concept of open and closed sets, their properties, their characterization and so on.
   - CO 3: - Students will be able to get a rigorous introduction to algebraic, geometric and topological structures of complex number system, functions of complex variable, their limit and continuity and so on

6. MTS5B07 Numerical Analysis

- CO 1: - Students will be able to understand the concept of interpolation and also learn some well known interpolation techniques.
- CO 2: -Students will be able to understand a few techniques for numerical differentiation and integration and also realize their merits and demerits.
- CO 3: -Students will be able to find out numerical approximations to solutions of initial value problems and also to understand the efficiency of various methods.

7. MTS5B08 Linear Programming
- CO 1: -Students will be able to solve linear programming problems geometrically
- CO 2: - Students will be able to understand the drawbacks of geometric methods
- CO 3: - Students will be able to understand duality theory, a theory that establishes relationships between linear programming problems of maximization and minimization

8. MTS5 B09 Introduction to Geometry
- CO 1: -Students will be able to recognise and classify conics.
- CO 2: - Students will be able to understand Kleinian view of Euclidean geometry
- CO 3: -Students will be able to understand affine transformations, the inherent group structure, the idea of parallel projections and the basic properties of parallel projections

9. MTS5D03 Linear Mathematical Models
- CO 1: - Students will be able to solve systems of Linear equations
- CO 2: - Students will be able to understand the concept matrices and its properties
- CO 3: - Students will be able to understand the simplex method.

SEMESTER - 6

10.   MTS6B10 Real Analysis

- ➢ CO 1: -Realise the difference between continuity and uniform continuity and equivalence of these ideas for functions on closed and bounded interval
- ➢ CO 2: -Understand the difference between pointwise and uniform convergence of sequences and series of functions
- ➢ CO 3: -Learn and find out examples/counter examples to prove or disprove the validity of several mathematical statements that arise naturally in the process/context of learning

11.   MTS6B11 Complex Analysis

- ➢ CO 1: -To understand the difference between differentiability and analyticity of a complex function and construct examples
- ➢ CO 2: -To understand necessary and sufficient condition for checking analyticity
- ➢ CO 3: -To know a few fundamental results on contour integration theory such a Cauchy's theorem, Cauchy – Goursat theorem and their applications
- ➢ CO 4: -To understand and apply Cauchy's integral formula and a few consequences of it such as Liouville's theorem, Morera's theorem and so forth in various situations

12.   MTS6B12 Calculus of Multivariable

- ➢ CO 1: -Understand several contexts of appearance of multivariable functions and their representation using graph and contour diagrams
- ➢ CO 2: -Understand the notion of partial derivative, their computation and interpretation
- ➢ CO 3: -Understand the idea of line integral and surface integral and their evaluations
- ➢ CO 4:-Learn three major results viz. Green's theorem, Gauss's theorem and Stokes' theorem of multivariable calculus and their use in several areas and directions

13.   MTS6B13 Differential Equations

- ➢ CO 1: -They will learn an ODE is, what it means by its solution, how to classify DEs, what it means by an IVP and so on
- ➢ CO 2: -They will realise the basic differences between linear and nonlinear DEs and also basic results that guarantees a solution in each case
- ➢ CO 3: -They will learn a method to approximate the solution successively of a first order IVP
- ➢ CO 4: -Students learn the technique of solving partial differential equations using the method of separation of variables

14.   MTS6B14(E01) Graph Theory (Elective)

- ➢ CO 1: - Students will be able to understand the Basic concepts in the graph theory
- ➢ CO 2: - Students will be able to understand the concept of Spanning trees
- ➢ CO 3: - Students will be able to understand the concept of planner graph