Department of Mathematics

M.Sc.Mathematics

Programme Outcomes

The M.Sc. Mathematics programme aims to prepare students with a deep understanding of mathematical concepts, research oriented attitude and skill of application of mathematical and computational tools and techniques in formulation and solution of real world problem.

COURSE Outcomes

MM 401: ALGEBRA - I

- Apply the Internal Direct Product Theorem in simple cases

- Decide whether a given group is cyclic, and given a finite cyclic group, find a generator for a subgroup of a given order

- Express a given finite cyclic group as the direct product of cyclic groups of prime power order and, given two direct products of cyclic groups, determine whether or not they are isomorphic

- Express products of elements of a group defined by generators and relations in appropriate standard form

- Recognize the dihedral and dicyclic groups when described using a standard form

MM 402: MATHEMATICAL ANALYSIS

- To get intuitive idea about linear transformations

- Get the idea of measureable set and integration with geometric interpretation

- To write the function in implicit form using implicit function theorem

- Deep study of convergence of integrals

MM 403: TOPOLOGY I

- To get the idea of countability and uncountability of sets

- Study of topological spaces and their various properties

- Recognize metric spaces geometrically

- Study the compactness and connected properties of topological space

MM 404: Differential Geometry

- To get introduced to the concept of a regular parameterized curve

- To Understand the concept of curvature of a space curve and signed curvature

- To be able to understand the fundamental theorem for plane curves.

- To get introduced to the notion of Serret-Frenet frame for space curves

- To study involutes and evolutes of space curves with the help of examples.

- To be able to understand the fundamental theorem for space curves

CS-405 A: Introduction to Computer Programming using C

- To learn the fundamental programming concepts and methodologies which are essential to building good C/C++ programs.

- To practice the fundamental programming methodologies in the C/C++ programming language via laboratory experiences. Microsoft Visual Studio is the programming environment that will be used.

- To code, document, test, and implement a well-structured, robust computer program using the C/C++ programming language.

- To write reusable modules (collections of functions)

MM 501: ALGEBRA-II (RINGS AND MODULES)

- To know the definitions of and understand the key concepts introduced in this module.
- To understand and be able to use the main results and proofs of this course.
- To be able to investigate the properties of a ring or module.
- To relate the concept of an ideal to homomorphisms and factor rings.
- To distinguish between the concepts of primeness and irreducibility.

MM 502: TOPOLOGY II

- To get to introduct to higher separation axioms
- To analyse products of different types of topological spaces
- To learn about filters and filterbase, convergence and clustering
- To get the idea about categories and functors

MM 503: DIFFERENTIAL EQUATIONS-I

- Solve first-order ordinary differential equations
- Find solution of higer-order linear differential equations
- Solve systems of linear differential equations
- Solve the linear systems in normal form

MM 504: COMPLEX ANALYSIS

- Define the concept of analytical function
- Study Cauchy's integral formula and about entire functions
- Study the poles and other singularities of the function
- To calculate the residue of rational functions

CS 505(A): Object Oriented Programming Using C++

- To describe the advantages of a high level language like C/C++, the programming process, and the compilation process
- To describe and use software tools in the programming process
- To design, implement, debug and test programs using the fundamental elements of C/C++

MM601: DIFFERENTIAL MANIFOLDS

- To study differential manifolds
- To introduce the concept of Riemann Manifolds having wide applications in various fields of Mathematics
- To understand torsion tensors and curvature

MM 602: FIELD THEORY

- To study field extensions
- To understand about normal and separable extensions
- To understand about insolvability of polynomials of higher degree

MM 603: DIFFERENTIAL EQUATIONS II

- To study differential equations started in previous semester
- To introduce more advanced techniques like Green's function and symmetry methods

MM606: COMPLEX ANALYSIS II

- To introduce more advanced techniques like Green's function and symmetry methods
- To study MittagLefflers expansion
- To analyse Monodromy theorem and Harmonic methods

MM609: OPTIMIZATION TECHNIQUES I

- To various types of programmings to obtain optimal solution
- To solve transportation and assignment problems
- To understand the strategy applied in game theory

MM 702: THEORY OF LINEAR OPERATORS

- To introduce the spectral techniques
- To study bounded linear operators
- To study operators in Hilbert space

MM 709: ALGEBRAIC CODING THEORY

- To understand the concept of error detection and error correction codes
- To introduce the application of finite field methods to the problem of coding theory
- To study simplex codes and related bounds

MM 710: COMMUTATIVE ALGEBRA

- To introduce the techniques of commutative algebra
- To discuss the behavior of prime ideals under localization

MM 716: MATHEMATICAL METHODS

- To solve integral equations
- To study variation methods

MM 717: ANALYTICAL NUMBER THEORY

- To develop the understanding of arithmetical functions
- To study the use of generating functions as an essential tool for additive theory of numbers
- To apply these concepts and techniques in various applications