

PROGRAMME : B. Sc. MATHEMATICS

A. PROGRAMME OUTCOMES (PO)

- ❖ Acquire domain knowledge
- ❖ Develop skills of critical thinking, reasoning, analytic and problem solving.
- ❖ Demonstrate empathetic social concern and equity.
- ❖ Build up scientific integrity and objectivity in professional endeavours.
- ❖ Student become capable to recognize different value systems including your own, and accept responsibility for them.
- ❖ Students will acquire the knowledge theory and methods in mathematics including some from the research frontier of the field as well as knowledge of the application of these models and methods to problems pertaining to other scientific areas and to the business world.
- ❖ Strengthen communication skill.
- ❖ Imbibe human values, inclusiveness attitude and socio- cultural sensitivity.
- ❖ Build up the ability of lifelong learning.
- ❖ Develop the skills to teach Mathematics at the secondary level.

B. PROGRAMME SPECIFIC OUTCOMES (PSO)

- ❖ To provide logic frame work in all areas of basic Mathematics.
- ❖ To attain foundation in basic Mathematics.
- ❖ To learn powerful tools for tackling topics in calculus.
- ❖ To learn powerful tools for tackling topics in theory of equations.
- ❖ To learn powerful tools for tackling topics in geometry.
- ❖ To get an introduction to almost All areas of Mathematics.

C. COURSE OUTCOMES (CO)

FIRST SEMESTER

MM 1141 : METHODS OF MATHEMATICS

Upon successful completion of this course students will :

- ❖ Understand the various methods of differential calculus and its properties such as extremum problems, Rolle's Theorem, Mean Value Theorem and its consequences.
- ❖ Understand the various methods of integral calculus, its properties through area, volume, length related concepts.
- ❖ Acquire the skill of problem solving.

SECOND SEMESTER

MM 1221 : FOUNDATIONS OF MATHEMATICS

Upon successful completion of this course students will :

- ❖ Begin the rigorous study of Mathematics, understand the concept of sets and functions.
- ❖ Realize the logical aspects such as connectives, truth tables, conditional statements and understand the usage of various quantifiers like universal and existential quantifiers in statements.
- ❖ Understand the fundamental concepts of Cartesian system and polar coordinate system and the relation between them.
- ❖ Understand the fundamental concepts of three – dimensional rectangular coordinate system and basic facts of quadric surfaces, cylindrical coordinate system, spherical coordinate system.
- ❖ Acquire the skill of problem solving.

THIRD SEMESTER

MM 1341 :ELEMENTARY NUMBER THEORY AND CALCULUS - I

Upon successful completion of this course students will :

- ❖ Acquire the knowledge of algebraic structures through congruence classes.
- ❖ Acquire the skill in differentiating and integrating vector valued functions.
- ❖ Analyze vector functions to find derivatives, tangent lines, integrals, arc length and curvature .
- ❖ Apply the knowledge to explain various physical phenomenon.
- ❖ Acquire the skill of problem solving.

FOURTH SEMESTER

MM 1441 :ELEMENTARY NUMBER THEORY AND CALCULUS - II

Upon successful completion of this course students will :

- ❖ Conceive the concept of irreducibility of polynomials in different rings and the Fundamental Theorem of Algebra.
- ❖ Acquire knowledge in the calculus of functions of two variables and three variables.
- ❖ Visualisation of functions of several variables.
- ❖ Acquire the skill of problem solving.

FIFTH SEMESTER

MM 1541 :REAL ANALYSIS - I

Upon successful completion of this course students will :

- ❖ Understand the notion of real numbers and ideas of limits in a formal manner.
- ❖ Conceive the concept of limits of sequences and series, limit of functions.
- ❖ Produce rigorous proofs of results that arise in the context of real analysis.
- ❖ Acquire skill in plotting softwares such as geogebra to plot various functions.

MM 1542 :COMPLEX ANALYSIS – I

Upon successful completion of this course students will :

- ❖ Understand the basic properties of complex numbers.
- ❖ Understand the definition of complex functions, power series representation of complex functions.
- ❖ Develops a knowledge about analytic functions and Cauchy- Riemann equations.
- ❖ Extend the knowledge of notions of differentiation and integration of complex functions.

MM 1543 : DIFFERENTIAL EQUATIONS

Upon successful completion of this course students will :

- ❖ Know how differential equations arise in various physical problems.
- ❖ Solve differential equations of first order and exact differential equations.
- ❖ Solve linear differential equations of second order.
- ❖ Acquire the skill of problem solving.

MM 1544 : VECTOR ANALYSIS

Upon successful completion of this course students will :

- ❖ Develop the notion directional derivatives.
- ❖ Develop knowledge about vector field and its divergence and curl.
- ❖ Conceive the idea of line integrals and conservative vector fields.
- ❖ Use Green's Theorem to find the work done by a force along a closed curve.
- ❖ Demonstrate Gauss' Theorem and Stoke'sThorem.
- ❖ Acquire the skill of problem solving.

MM 1545 : ABSTRACT ALGEBRA – I

Upon successful completion of this course students will :

- ❖ Acquire the knowledge of binary structures such as groups, subgroups, cyclic groups by using the skill of binary operations.
- ❖ Understand various properties of above said binary structures and its characterisations.
- ❖ Acquire the skill of problem solving.

MM 1551.1 : OPEN COURSE – OPERATIONS RESEARCH

Upon successful completion of this course students will :

- ❖ Acquire skills to formulate Linear Programming Problem and solve them using graphical method and simplex method.
- ❖ Understand variety of problems such as Assignment Problem, Transportation Problem etc.
- ❖ Acquire the knowledge to CPM and PERT techniques to plan, schedule and control project activities.

SIXTH SEMESTER

MM 1641 : REAL ANALYSIS - II

Upon successful completion of this course students will :

- ❖ Identify the continuity and discontinuity of various functions.
- ❖ Understand differentiation from a conceptual point of view.
- ❖ Develops knowledge about Riemann integration and applies into problems.
- ❖ Acquire the skill of problem solving.

MM 1642 :LINEAR ALGEBRA

Upon successful completion of this course students will :

- ❖ Understand the algebraic and geometric representation of vectors in Euclidean n-space.
- ❖ Learn to solve system of linear equations using the language of matrices.
- ❖ Conceive the concept of linear transformations, eigen values, eigen vectors and diagonalisations.

MM 1643 : COMPLEX ANALYSIS - II

Upon successful completion of this course students will :

- ❖ Represent functions as Power and Laurent series and classify isolated singular points.
- ❖ Critically evaluate application of Residue Theorem in the evaluation of some integrals.
- ❖ Evaluate improper integrals in various situations.
- ❖ Acquire the skill of problem solving.

MM 1644 : ABSTRACT ALGEBRA – II

Upon successful completion of this course students will :

- ❖ Familiar with the concept of homomorphism of groups and factor groups.

- ❖ Review the concept of rings and understand the concept of factor rings.
- ❖ Use the knowledge to solve different problems.

MM 1645 : COMPUTER PROGRAMMING

Upon successful completion of this course students will :

- ❖ Acquire the skill of document preparation in computers using the LATEX type setting program and also the basics of computer programming using Python.
- ❖ Develop the skill for writing the elementary programs by using Python code.

MM 1661.1 : GRAPH THEORY (ELECTIVE)

Upon successful completion of this course students will :

- ❖ Build an awareness of some of the fundamental concepts in Graph Theory.
- ❖ Study the Konigsberg Bridge Problem, The Chinese Postman Problem, and the Teleprinter's Problem and their graph models and solutions.
- ❖ Learn about trees and its properties.
- ❖ Understand the concept of planar and non- planar graphs.