

Course outcomes

Name of the Course	Course code	Course outcomes	PSO addressed
Algebra – I	MTH1C01	<ul style="list-style-type: none"> To get the idea of different types of groups and group action on a set To understand the concept of isomorphism theorems and their significance, Sylow theorems and its applications To understand factorization of a polynomial over a field, homomorphism and factor rings 	PSO1, PSO2
Linear Algebra	MTH1C02	<ul style="list-style-type: none"> To understand the concept of vector spaces, their basis, dimension and linear transformations To understand more about linear transformations and some of its important properties, elementary canonical forms To introduce the concept of Inner product spaces, orthogonal compliment and direct sums of vector spaces. 	PSO2, PSO3
Real Analysis – I	MTH1C03	<ul style="list-style-type: none"> To introduce the concept of basic topology, difference between continuous and uniformly continuous functions and its properties. To understand the concept of differentiation of vector valued functions and integration of functions. To understand the difference between pointwise convergence and uniform convergence of sequence of functions, convergence of series of functions 	PSO1, PSO2
Discrete Mathematics	MTH1C04	<ul style="list-style-type: none"> To study about Boolean algebra and Boolean functions. To learn basics about graphs and trees. To study about planarity and connectivity To know the basic about automata. To learn about DFA and NFA 	PSO3, PSO4

Number Theory	MTH1C05	<ul style="list-style-type: none"> • To introduce Arithmetical functions, Dirichlet multiplication and derivatives of arithmetical functions, Averages of arithmetic. • To understand the Equivalent forms of prime number theorem, Partial sums of Mobius function. • To understand the quadratic residues and quadratic reciprocity law, Jacobi's symbol, basics of cryptography, types of cryptosystem and its cryptanalysis. 	PSO6, PSO4
Ability Enhancement Course	MTH1A01	<ul style="list-style-type: none"> • Provide an opportunity to learn from professionals in the field of Mathematics • Presentation of seminar based on topics in Mathematics beyond the prescribed syllabus. • Initial steps towards research through case study/book reviews/paper presentations. 	PSO5, PSO6
Algebra- II	MTH2C06	<ul style="list-style-type: none"> • To introduce the concept of finite and extension fields, geometric constructions etc. • To understand the concept of Isomorphism Extension Theorem, Splitting and Separable Extensions. • To understand Galois theory and the Insolvability of the Quintic 	PSO2 , PSO4
Real Analysis II	MTH2C07	<ul style="list-style-type: none"> • To introduce the concept of Sigma Algebra, Borel sets, Lebesgue Measure, Lebesgue Measurable Functions • To understand the concept of Lebesgue integration, the L^p spaces : Completeness and Approximation • To understand the concept of differentiation and integration. 	PSO1, PSO2
Topology	MTH2C08	<ul style="list-style-type: none"> • To introduce the concept of basic topology, topological space, different types of topologies. • To understand the concept of making functions continuous, quotient spaces • To understand the separation axioms, the Urysohn characterization of normality, Tietz characterization of normality 	PSO2

ODE & calculus of Variations	MTH2C09	<ul style="list-style-type: none"> • To understand the power series solutions of ordinary differential equations and the significance of special functions • To know more about special functions, systems of first order equations and nonlinear equations • To understand the qualitative nature of solutions and calculus of variation 	PSO3, PSO4
Operations Research	MTH2C10	<ul style="list-style-type: none"> • To study about convex functions • To learn about methods to solve LPP and transportation problems • To know about sensitivity in LPP and methods to solve networks. • To understand game theory. 	PSO4, PSO3
Multivariable Calculus & Geometry	MTH3C11	<ul style="list-style-type: none"> • To study about functions of several variables • To learn about the analytical and geometric concepts of curves and its variations • To study about curvature and surfaces • To know The Gauss and Weingarten maps, • To learn Gaussian and mean curvature. 	PSO1, PSO2
Complex Analysis	MTH3C12	<ul style="list-style-type: none"> • To introduce the concept of Power series and Analytic functions • To understand the concept of Cauchy's Theorem and Integral Formula, Open Mapping Theorem and Goursat's Theorem. • To understand the Argument Principle, the Maximum Principle and Schwarz's Lemma. 	PSO1, PSO2



Functional Analysis	MTH3C13	<ul style="list-style-type: none"> • To study about normed spaces and its properties • To learn about Hilbert spaces, Projection and Linear functionals. • To study about duality. 	PSO2, PSO4
PDE & Integral Equations	MTH3C14	<ul style="list-style-type: none"> • To study solutions of PDE and to understand the nature of solutions via characteristic curves, graphical method. • To study methods of solving second order PDE, elliptic PDEs and energy method • To understand the relation between differential equation and integral equations, also different methods to solve integral equations. 	PSO3, PSO4
Cryptography	MTH3E02	<ul style="list-style-type: none"> • To study about classical cryptosystems and its cryptanalysis. • To learn Shannon's theory and perfect secrecy • To study about product cryptosystems • To know about construction of various block ciphers. • To learn about iterated hash functions 	PSO6
Advanced Functional Analysis	MTH4C15	<ul style="list-style-type: none"> • To study about spectrum and self adjoint operators • To learn about orthoprojection and spectral integral. • To learn Hahn Banach theorem and its corollaries 	PSO2, PSO4
Algebraic Number Theory	MTH4E06	<ul style="list-style-type: none"> • Awareness about different types of numberfield and their properties. • Able to check unique factorization in fields and also can provide examples of nonunique factorizations. • To understand the geometric representation of algebraic numbers 	PSO3, PSO4

Differential Geometry	MTH4E09	<ul style="list-style-type: none"> To introduce the concept of graphs and level sets, basics of surfaces and notion of tangent space and Gauss map. To understand the concept of parallel transport, local and global parametrization, arc length and line integral. To understand the principal, Gaussian, Gauss Kronecker and Mean curvature, and parametrized surfaces. 	PSO1, PSO3
Graph Theory	MTH4E11	<ul style="list-style-type: none"> To introduce the concept of basic graph theory, trees, cut vertices and cut edges, Euler tour and Hamilton cycles To understand the concept of matchings and covering, Edge colouring. To understand the concepts of vertex colouring and it's important results. Planar graphs and dual graphs 	PSO4, PSO5
Project	MTH4P01	<ul style="list-style-type: none"> Learn the basics of research theory and techniques Understand how to do a literature review, and how to appraise the literature to address questions Explore an area of interest, develop some expertise and a deeper understanding of a topic Learn to communicate scientific research in verbal presentations and written form. 	PSO5, PSO6
Viva Voce	MTH4V01	<ul style="list-style-type: none"> To replicate the learnt topics and to interconnect various branches of the subject Enhance the ability to communicate Mathematics Effectively 	PSO5, PSO6