M.E.S MAMPAD COLLEGE (AUTONOMOUS)

MAMPAD COLLEGE P.O, MALAPPURAM, KERALA, INDIA, 676542

Affiliated to University of Calicut

Accredited by NAAC with A grade

Syllabus Year	2019-20
Department	Mathematics
Programme	MSc

Programme outcome.

Sl.No	Programme Outcome
PO1	Inculcate critical thinking to carry out scientific investigation objectively without being biased with preconceived notions.
PO2	Equip the student with skills to analyze problems, formulate a hypothesis, evaluate and validate results, and draw reasonable conclusions thereof.
PO3	Prepare students for pursuing research or careers in industry in mathematical sciences and allied fields

Continue adding rows till the POs are completely added.

Programme specific out come

Sl.No	Programme Specific Outcome.
PSO1	A solid understanding of graduate level algebra, analysis and topology. Using their mathematical knowledge to analyse certain problems.
PSO2	Identifying unsolved yet relevant problems in a specific field. Undertaking original research on a particular topic.
PSO3	Communicate mathematics accurately and effectively in both written and oral form. Conducting scholarly or professional activities in an ethical manner.

Continue adding rows till the POs are completely added

Course Outcome (add sufficient Number of rows in each semester)

Semester	Course Code	Course Name	Course out come
I	MTH1C01	ALGEBRA **1**	**MTH1C01: ALGEBRA 1** Learn the concept of group action and theorems about group actions. Understand the concept of p -groups and sylow theorems.
			Learn rings of polynomials, direct product of groups, fundamental theorem of homomorphism, isomorphisms theorems. Learn free groups and group presentations.
	MTH1C02	LINEAR ALGEBRA	Learn basic properties of vector spaces. Understand the relation between linear transformations and matrices.
			Understand the concept of diagonalizable and triangulable operators and various fundamental results of these operators.
			Understand Primary decomposition Theorem and learn basic properties of inner product spaces.
	MTH1C03	REAL ANALYSIS	Understand basic topology.
			Understand the concept Differentiation
			Learn The Riemann Stieltjes integral, Uniform convergence and continuity
			Learn Uniform convergence and integration
			Understand Uniform convergence and differentiation.
	MTH1C04	DISCRETE MATHEMATICS	Learn about order relation, lattices, Boolean Algebra, Boolean function.
			Gain the knowledge of different types of graphs, their operations, properties.
			Learn the basics of Automata theory and its applications through solving problems using NDA, DFA.
	MTH1C05	NUMBER THEORY	Be able to effectively express the concepts and results of number theory.
			Learn basic theory of arithmetical functions and Dirichlet multiplication, averages of some

			arithmetical functions.
			Understand distribution of prime numbers and prime number theorem
			Learn the concept of quadratic residue and Quadratic reciprocity laws.
			Get a basic knowledge in Cryptography
II	MTH2C06	ALGEBRA II	Introduces primal and maximal ideals
			Introduces extension fields
			Understand the concept of algebraic extensions
			Learn the concept Geometric constructions
			Understand the concepts Finite fields, Automorphism of fields, Isomorphism extension theorem
			Understand Splitting fields, separable extensions and Galois theory.
	MTH2C07	REAL ANALYSIS II	Learn why and for what the theory of measure was introduced
			Learn the concept of measures and measurable functions
			Learn Lebesgue integration and its various properties
			Learn how to generalize the concept of measure theory.
			Learn that a measure may take negative values.
	MTH2C08	Topology	Learn Topological spaces, subspace topology, continuous functions and sets with imposed topologies.
			Understand the concept of product topology, metric topology, quotient topology, connectedness, compactness,countability axioms,Urysohn Lemma.
	MTH2C09	ODE & calculus of variations	Learn to solve ODE using power series method and know about some special functions and their properties.
			Know to solve the system of first order equations and understand the concepts of stability, classification of roots and the application.
			Understand about the oscillation theory, existence and uniqueness solution of first order ode, importance of Picard's successive approximation.
	MTH2C10	OPERATIONS RESEARCH	Learn graphical methods and the simplex algorithm for solving a linear programming problem.
			Learn more optimization techniques for solving the linear programming models-transportation problem and integer programming problem.
			Learn optimization techniques for solving some network related problems.

			Learn sensitivity analysis and parametric programming, which describes how various changes in the problem affect its solution.
III	MTH3C11	Multivariable Calculus and Geometry	Learn differentiability in several variables, Inverse function theorem, Implicit function theorem, Rank theorem, Graphs and level sets, The tangent space, curves and surfaces, Tangent, curvature, Principal normal, Binormal, torsion, The Frenet formulas, the tangent surface, Orientation, Gauss map, Geodesics, The Weingarten map.
	MTH3C12	COMPLEX ANALYSIS	Learn the concept of (complex) differentiation and integration of functions defined on the complex plane and their properties.
			Be thorough in power series representation of analytic functions, different versions of Cauchy'sTheorem.
			Get an idea of singularities of analytic functions and their classifications.
			Learn different versions of maximum modulus theorem.
	MTH3C13	FUNCTIONAL ANALYSIS	Learn the concept of normed linear spaces and Hilber spaces.
			Learn various properties operators defined on both normed and Hilbert spaces.
			Understand the concept of Dual space and properties.
			Understand the space of Bounded operators, Compact operators, Integral operators and Invertible operators
	MTH3C14	PDE & Integral Equations	Able to solve the furst and second order pde writing the canonical form of the equations and know about one dimensional wave equation.
			To solve the heat and wave equation using the method of separation of variables, and solving elliptic equation and learn their properties and application
			Learn the relation between the integral and differential equation, transform integral equation to differential equation and vice versa and get the knowledge about Hilbert-Schmidt theory, Fredholm theory, Neumann series.
	MTH3E03	MEASURE AND INTEGRATION	Introduce the concept of measurability, Simple functions, Elementary properties of measures.
			Introduce the concept of Integration of Positive Functions, Integration of Complex Functions
			To learn The Role Played by Sets of Measure zero, Topological Preliminaries

			To learn the concepts Riesz Representation Theorem, Regularity Properties of Borel Measures, Lebesgue Measure, Continuity Properties of Measurable Functions
			Understand Total Variation, Absolute Continuity, Consequences of Radon Nikodym Theorem.
			Understand Bounded Linear Functionals on L P, The Riesz Representation Theorem.
			To learn about the concepts Measurability on Cartesian Products, Product Measures, The Fubini Theorem, and Completion of Product Measures.
IV	MTH4C15	ADVANCED FUNCTIONAL ANALYSIS	Understand the notions of Fredholm theory of compact Operators and their general properties
			Apply the theory to understand and solve some problems of integral equations at an appropriate level of difficulty.
			Describe the construction of the spectral integral.
			Recognize the fundamentals of Banach spaces and Banach Algebras.
	MTH4E09	DIFFERENTIAL GEOMETRY	Introduces Graphs and Level Set, Vector fields, The Tangent Space, Curvature of Surfaces.
			Learn Surfaces, Arc Length and Line Integrals
			Introduces Vector Fields on Surfaces, Orientation, Curvature of Plane Curves
			Introduces the Gauss Map, Geodesics, Parallel Transport, The Weingarten Map
			Understand the concepts Parametrized Surfaces, Local Equivalence of Surfaces and characterized surfaces.
	MTH4E08	Commutative Algebra	Know basic theory for noetherian rings.
			Have insight in the correspondence between ideals in polynomial rings, and the corresponding geometric objects.
	MTH4E11	GRAPH THEORY	Learn different types of graphs.Learn the concept matching in graphs and related results.
			Understand what is meant by coloring. Learn Planar Graphs.