Department of Mathematics
Course Outcomes
M.Sc. Mathematics

Course Name: Algebra	Course Code: P16MA11
Upon Completion of the course students would be able to	
CO1	Summarize the concept of Sylow's theorem, Cayley's theorem.
CO2	Give a detailed knowledge about the Euclidean Rings.
CO3	Acquire knowledge on Polynomial rings – Polynomials over the rational field.
CO4	Understand Extension fields, Roots of Polynomials.
CO5	Explain the concepts of roots of the polynomials and Galois theory.
Course Name: Real Analysis	**Course Code: P16MA12**
Upon Completion of the course students would be able to	
CO1	Describe the topological properties on metric space.
CO2	Differentiate continuity and uniform continuity with examples and infer the compactness in continuity and connectedness.
CO3	Explain the concept of Riemann- Stielije's Integrability and its properties and discuss Rectifiable curves.
CO4	Explain the sequence of family of continuous and equicontinuous functions and their convergence limits and determine whether the sequence of functions which are pointwise convergent and uniform convergent
CO5	Summarize the concept of Functions of several variables, The Implicit Function Theorem.
Course Name: Ordinary Differential Equations	**Course Code: P16MA13**
Upon Completion of the course students would be able to	
CO1	Evaluate The general solution of the homogeneous equation, the method of variation of parameters, Power Series solutions.
CO2	Explain the concept of Regular Singular Points, Gauss's hypergeometric equation, Properties of Legendre Polynomials and Bessel functions
CO3	Find solutions Linear Systems of First Order Equations, The Existence and Uniqueness of Solutions of Initial Value Problem for First Order Ordinary Differential Equations.

CO4	Summarize the concept of Oscillation Theory and Boundary value problems, Eigen values, Eigen functions and the Vibrating String.
CO5	Explain the concept of Nonlinear equations, the phase plane and its phenomena.
Course Name: Graph Theory	**Course Code: P16MA14**
Upon Completion of the course students would be able to	
CO1	A rigorous study of the basic concepts of Graph Theory.
CO2	Recognize trees and connectivity
CO3	Recall the concept of Hamiltonian and Eulerian graph.
CO4	Illustrate the proper Coloring and chromatic polynomial.
CO5	Understand the concept of Planar and Nonplanar Graphs, Euler Formula and its Consequences
Course Name: Integral Equations, Calculus Of Variations And Transforms	**Course Code: P16MA15**
Upon Completion of the course students would be able to	
CO1	Acquire the knowledge of Calculus of variations natural boundary conditions and transition condition.
CO2	Know about the Fourier transform, Fourier integral theorem, Parseval's identity.
CO3	Know about the Hankel Transform, Some important results for Bessel Function, Parseval's Theorem.
CO4	Study Linear Integral Equations, the inner and scalar product of two functions.
CO5	Apply iterative methods Method of successive approximations:
Course Name: Complex Analysis	**Course Code: P16MA21**
Upon Completion of the course students would be able to	
CO1	Define analytic function and carry out conformal mappings with complex numbers.
CO2	Evaluate a contour integral using fundamental theorem in complex integration and Cauchy's integral formula.
CO3	Acquire the knowledge of Local Properties of Analytic Functions, The Open Mapping Theorem
CO4	Understand the concept of The General Form of Cauchy's Theorem, Proof of Cauchy's Theorem.

CO5	Define Harmonic Functions, Schwarz's Theorem, The Reflection Principle, Power series Expansions, Weierstrass's Theorem.
Course Name: Linear Algebra	**Course Code: P16MA22**
Upon Completion of the course students would be able to	
CO1	Acquire knowledge about bases and dimension.
CO2	Understand the linear transformation using matrices.
CO3	Understand the polynomial ideals and the prime factorization of polynomials.
CO4	Acquire knowledge about Permutations and the uniqueness of determinants.
CO5	Differentiate the triangulization and diagonalization.
Course Name: Partial Differential Equations	**Course Code: P16MA23**
Upon Completion of the course students would be able to	
CO1	Evaluate the first order partial differential equation for finding solutions.
CO2	Understand the Cauchy's method of characteristics, compatible systems of first order equations, Charpits method.
CO3	Acquire knowledge Partial differential equations of the second order.
CO4	Learn about Characteristics of equations in three variables.
CO5	Know about Elementary solutions of Laplace's equations.
Course Name: Fuzzy Sets and Their Applications	**Course Code: P16MAE1C**
Upon Completion of the course students would be able to	
CO1	Acquire knowledge about
CO2	Discuss the types of operations on fuzzy sets, t- norms and fuzzy arithmetic.
CO3	Learn about Arithmetic operations on Fuzzy numbers.
CO4	Identify fuzzy relations, binary fuzzy relations and fuzzy equivalence relations.
CO5	Describe and discuss Multi-person Decision Making-Ranking methods, Fuzzy Linear programming.
Course Name: Stochastic Processes	**Course Code: P16MAE2A**
Upon Completion of the course students would be able to	
CO1	Understand the classification of stochastic processes and the idea of Markov chains in various field.

CO2	Apply the concept of higher transition probabilities with their class of states
CO3	Understand the various distributions involved in in Poisson process through practical problems.
CO4	Analyze the concept of renewal process with its application.
CO5	Compute queuing model with its characteristics

Course Name: Classical Dynamics	**Course Code: P16MA31**
Upon Completion of the course students would be able to	
CO1	Recall and relate the basic notions of the mechanical system.
CO2	Compute Lagrange's equation.
CO3	Understand the various Special Applications of Lagrange's Equations.
CO4	Learn about Hamilton's principle, Hamilton's equations.
CO5	**Know about** Hamilton's Principal Function, The Hamilton - Jacobi equation.

Course Name: Measure and Integration	**Course Code: P16MA32**
Upon Completion of the course students would be able to	
CO1	Understand basis of measure theory
CO2	Study about Riemann and Lebesgue integrals.
CO3	Acquire the knowledge of Abstract Measure spaces.
CO4	Acquire the knowledge of convergence in measure. Understand the Halin decomposition theorem & Jordan decomposition theorem.
CO5	Learn about measurability and Fubini's theorem.

Course Name: Topology	**Course Code: P16MA33**
Upon Completion of the course students would be able to	
CO1	Obtain the knowledge of fundamental concepts and methods in General topology.
CO2	Acquire knowledge about Product topology and Metric topology.
CO3	Know about Connected spaces, connected subspaces of the Real line, Components and local connectedness.
CO4	Study about Compact spaces, compact subspaces of the Real line, Limit Point Compactness, Local Compactness.
CO5	Learn about Countability and Separation Axioms.

Course Name: Discrete Mathematics		Course Code: P16MAE3B
Upon Completion of the course students would be able to		
CO1	Recall the concept of Set theory and its properties.	
CO2	Learn about Mathematical Logic.	
CO3	Acquire the knowledge of Lattices as Partially Ordered Sets.	
CO4	Obtain the knowledge of Various Boolean identities.	
CO5	Acquire knowledge about Phrase structure grammars, rewriting rules, derivation sentential forms, language generated by grammar, regular, context free and context sensitive grammar and languages.	
Course Name: Advanced Operations Research		Course Code: P16MAE3B
Upon Completion of the course students would be able to		
CO1	Understand the different methods of I.P.P method and mixed integer LPP.	
CO2	Acquire knowledge about Dynamic programming.	
CO3	Obtain the knowledge of Decision Theory and Games.	
CO4	Learn about Inventory Models.	
CO5	Study about Kuhn Tucker conditions and Quadratic programming.	
Course Name: Functional Analysis		Course Code: P16MA41
Upon Completion of the course students would be able to		
CO1	Understand the concept of Banach spaces & Hilbert spaces.	
CO2	Acquire knowledge about Hilbert spaces.	
CO3	Describe the structure of finite dimensional spectral theory.	
CO4	Study about Regular, singular elements and the spectrum.	
CO5	Learn about The Structure of Commutative Banach Algebras.	
Course Name: Differential Geometry		Course Code: P16MA42
Upon Completion of the course students would be able to		
CO1	Obtain the knowledge of Space Curves Fundamental Existence Theorem for space curves.	
CO2	Understand the concept of Intrinsic Properties of a Surface.	
CO3	Acquire knowledge about Canonical geodesic equations, Gauss- Bonnet Theorem, Gaussian curvature.	

CO4	Describe the Non-Intrinsic Properties of a Surface, Developable associated with space curves and with curves on surface.
CO5	Learn about Compact surfaces whose points are umbilics- Hilbert's lemma.
Course Name: Advanced Numerical Analysis	**Course Code: P16MA43**
Upon Completion of the course students would be able to	
CO1	Understand the fundamentals of solutions of Algebraic and transcendental equations.
CO2	Understand how to use Jacobi iteration method, Gauss Seidel Iteration method, power method.
CO3	Acquire knowledge to use Hermite interpolation and least square approximation.
CO4	Be familiar with interpolation and extrapolation method.
CO5	Gain the knowledge of Ordinary differential equations, Single step Methods.
Course Name: Algebraic Number Theory	**Course Code: P16MAE5C**
Upon Completion of the course students would be able to	
CO1	Acquire knowledge about divisibility and congruences.
CO2	Understand the techniques of numerical calculations of prime moduli and power moduli using congruences.
CO3	Understand the ideas of quadratic residues and quadratic reciprocity.
CO4	Acquire knowledge about binary quadratic forms and recurrence relation.
CO5	Gain the knowledge of Diophantine Equations
Course Name: Project	**Course Code: P16MAPW**
Upon Completion of the course students would be able to	
CO1	Helps to understand deep knowledge in particular area of research
CO2	Helps the students to learn how to collect articles and how to write dissertation
CO3	How to design research experiments
CO4	How to analysis the data statistically
CO5	How to prepare reports for presentation in conferences and seminars