PROGRAMME SPECIFIC OUTCOMES, PROGRAMME OUTCOMES AND COURSE OUTCOMES

PG & RESEARCH DEPARTMENT OF MATHS / B.Sc., (MATHS), M.Sc., (MATHS) & M.Phil., (MATHS)

PSOs	PROGRAMME SPECIFIC OUTCOMES
PSO1	Understanding the mathematical concepts and applications in the field of algebra, analysis, computational techniques, optimization, differential equations, engineering, finance and actuarial science.
PSO2	Handling the advanced techniques in algebra, analysis, computational techniques, optimization, differential equations, engineering, finance and actuarial science to analyze and design algorithms solving variety of problems related to real life problems.
PSO3	Adopting changing scientific environment in the process of sustainable development by using mathematical tools.
PSO4	Enhancing necessary skills and expertise in the field of research and developments through seminar and dissertation.
PSO5	Developing teaching skills, subject knowledge in the course of study to shine in various field including Education, IT etc.
B.Sc., MATHEMATICS	
B.Sc., (Maths) / UMT21 / PROGRAMMES OUTCOMES	
POs	**Description of POs**
PO1	Gaining a broad knowledge of the mathematical concepts
PO2	Comprehending the fundamental statements for the study of various areas of mathematics and define and describe them with clarity.
PO3	Demonstrating basic manipulate skills in algebra, geometry, Trigonometry, and beginning calculus.
PO4	Discussing, formulating and analyzing the problems and identifying the concepts and principles to solve them.
PO5	Evaluating the basic foundation of the underlying theorems and proofs of Mathematics.
PO6	Developing experience investigating the real world problems and learn to how to apply mathematical ideas and models to those problems.
PO7	Analyzing the various types of problems to solving creatively and critically.

B.Sc., (Maths) / UMT21 / COURSE OUTCOMES		
	Description of COs	**Bloom's Taxonomy / Cognitive Domain**
UMTT11	**Calculus**	
CO1.	Learning the different concepts of differential and integral calculus	Knowledge (Level 1)
CO2.	Understanding the basic knowledge of integration	Comprehension (Level 2)
CO3.	Solving the multiple integrals and its Applications	Evaluation (Level 5)
CO4.	Applying the concept of Change of variables	Application (Level 3)
CO5.	Solving problems encountered in everyday life, further study in science.	Evaluation (Level 5)
UMTT12	**Classical Algebra**	
CO1.	Understanding various applications of algebraic Methods.	Comprehension (Level 2)
CO2.	Understanding relation between roots and coefficients of equations, sign changes, reciprocals.	Comprehension (Level 2)
CO3.	Creating skills for solving equations.	Creation (Level 6)
CO4.	Studying in the various applications of algebraic methods	Knowledge (Level 1)
CO5.	Analyzing terms of series, summation and its changes.	Analysis (Level 4)
UMTT21	**Analytical Geometry 3D**	
CO1.	Knowing of planes and its properties as a 3 dimensional objects.	Knowledge (Level 1)
CO2.	Understanding the concept of skew lines and spheres	Comprehension (Level 2)
CO3.	Solving problems of three dimensions	Evaluation (Level 5)
CO4.	Solving the Problems related to geometry of three dimension	Evaluation (Level 5)
CO5.	Applying the Geometric objects of three dimension	Application (Level 4)
UMTT22	**Differential Equations and Laplace Transforms**	
CO1.	Introducing the basic concept of differential equations	Knowledge (Level 1)
CO2.	Analyzing theory of partial differential equations	Analysis (Level 4)
CO3.	Solving varies types of differential equations	Evaluation (Level 5)
CO4.	Solving Partial Differential Equations using various techniques	Evaluation (Level 5)
CO5.	Determining solutions to second order linear homogeneous equations	Evaluation (Level 5)

UMTT31	**Statics**	
CO1.	Gaining knowledge about the nature of forces	Knowledge (Level 1)
CO2.	Differentiating between static and dynamic forces	Evaluation (Level 5)
CO3.	Applying geometric properties in equilibrium	Application (Level 3)
CO4.	Understanding the Real Time Applications	Comprehension (Level 2)
CO5.	Applying the concept in Parallel forces, moments and compels	Application (Level 3)
UMTA32	**Ancillary Mathematical Statistics - I**	
CO1.	Gaining knowledge about the concepts of Probability.	Knowledge (Level 1)
CO2.	Applying statistical investigation of real life situations.	Application (Level 3)
CO3.	Solving problems arise in different situations	Evaluation (Level 5)
CO4.	Developing various types of distributions.	Analysis (Level 4)
CO5.	Differentiating between discrete and continuous random variables.	Evaluation (Level 5)
UMTE31	**Vector Calculus, Fourier Series and Fourier Transforms**	
CO1.	Introducing the basic concept of vector calculus	Knowledge (Level 1)
CO2.	Analyzing the fourier series and their applications	Analysis (Level 4)
CO3.	Solving varies types Integrals	Evaluation (Level 5)
CO4.	Understanding the concepts of vector Integration	Comprehension (Level 2)
CO5.	Applying the Fourier Transforms Methods	Application (Level 3)
UMTN31	**Resource Management Techniques**	
CO1.	Developing the evaluate short, and long term process	Analysis (Level 4)
CO2.	Studying for Linear Programming Problem	Knowledge (Level 1)
CO3.	Solving different types of problems.	Evaluation (Level 5)
CO4.	Applying the concept of Sequencing Problem	Application (Level 3)
CO5.	Understanding the concept of basic Game Theory	Comprehension (Level 2)
UMTS31	**Astronomy I**	
CO1.	Gaining the knowledge about natural science	Knowledge (Level 1)
CO2.	Understanding the varies triangles and formulas	Comprehension (Level 2)

CO3.	Describing the concept of morning and evening stars, circumpolar stars	Analysis (Level 4)
CO4.	Learning the different concepts of morning and evening stars	Knowledge (Level 1)
CO5.	Applying the concept of diurnal motion of sun and stars	Application (Level 3)
UMTT41	**Dynamics**	
CO1.	Gaining knowledge regarding projectiles	Knowledge (Level 1)
CO2.	Differentiating between impact and impulse of a particle on a surface	Evaluation (Level 5)
CO3.	Understanding the dynamic changes in the body under the action of forces	Comprehension (Level 2)
CO4.	Studying the concepts of simple harmonic motion	Knowledge (Level 1)
CO5.	Applying the concept in motion under action of central forces.	Application (Level 3)
UMTT42	**Sequence and Series**	
CO1.	Understanding the various Types of Sets	Comprehension (Level 2)
CO2.	Analyzing terms of series, and finding the rearrangements	Analysis (Level 4)
CO3.	Developing skills in the area of sequence and series	Analysis (Level 4)
CO4.	Solving the varies types of Tests	Evaluation (Level 5)
CO5.	Applying the concept of Power series	Application (Level 3)
UMTA42	**Ancillary Mathematical Statistics - II**	
CO1.	Understanding the concept of Applied Statistics	Comprehension (Level 2)
CO2.	Developing clear idea regarding correlation and regression	Evaluation (Level 5)
CO3.	Gaining the knowledge in sampling Theory	Knowledge (Level 1)
CO4.	Solving the varies types of Sampling Distribution	Evaluation (Level 5)
CO5.	Applying the concept of Statistical Methods	Application (Level 3)
UMTE42	**Discrete Mathematics**	
CO1.	Understanding the concept of Mathematical logic such as connections	Comprehension (Level 2)
CO2.	Classifying the concept of Normal Forms	Evaluation (Level 5)
CO3.	Gaining the knowledge in Formal Languages and Automatta	Knowledge (Level 1)
CO4.	Analyzing the free and bound variable formulas	Analysis (Level 4)
CO5.	Applying the concept of Mathematical logic as Tautology	Application (Level 3)

UMTN42	**Mathematical Aptitude**	
CO1.	Developing the skills in numerical and quantitative techniques	Evaluation (Level 5)
CO2.	Analyzing to evaluate various real life situations	Analysis (Level 4)
CO3.	Solving different types of Mathematical problems	Evaluation (Level 5)
CO4.	Understanding the concepts of Quantitative Techniques	Comprehension (Level 2)
CO5.	Applying the concept of Fractions	Application (Level 3)
UMTS42	**Astronomy II**	
CO1.	Gaining the knowledge of equation of time, seasons from earth rotation	Knowledge (Level 1)
CO2.	Applying the various fields such as physics, chemistry	Application (Level 3)
CO3.	Calculating to prepare Calendar and conservation of Time	Evaluation (Level 5)
CO4.	Learning the concepts of earth's pole	Knowledge (Level 1)
CO5.	Understanding the basic knowledge of equation of Time	Comprehension (Level 2)
UMTT51	**Abstract Algebra**	
CO1.	Understanding the concept of Ideal Quotient Rings and Fields	Comprehension (Level 2)
CO2.	Developing aspects of Subgroups, Normal Subgroups and Quotient Groups	Evaluation (Level 5)
CO3.	Gaining the knowledge in Ring Theory	Knowledge (Level 1)
CO4.	Providing some knowledge about various algebraic structures	Knowledge (Level 1)
CO5.	Recognizing basic properties of groups and subgroups	Analysis (Level 4)
UMTT52	**Real Analysis**	
CO1.	Understanding the concept of Sets and Metric Spaces	Comprehension (Level 2)
CO2.	Applying the theorems of connectedness and Compactness	Application (Level 3)
CO3.	Learning the knowledge in Set Theory, Countable and Uncountable Sets	Knowledge (Level 1)
CO4.	Recognizing basic properties of Metric Spaces	Analysis (Level 4)
CO5.	Understanding the basic concepts of continuous Functions	Comprehension (Level 2)
UMTT53	**Operations Research - I**	
CO1.	Developing the concept of short, long term processes and solve Problems	Analysis (Level 4)
CO2.	Identifying the basic analysis of various inventory Models	Evaluation (Level 5)

CO3.	Studying the concept of duality in an Linear Programming Problem	Knowledge (Level 1)
CO4.	Understanding the concept of duality programming	Comprehension (Level 2)
CO5.	Analyzing the different aspects of Transportation Problem and also Assignment Problem	Analysis (Level 4)
UMTT54	**Number Theory**	
CO1.	Differentiating Various Types of Functions	Knowledge (Level 1)
CO2.	Applying the theorems of Numbers	Application (Level 3)
CO3.	Developing basic concept of Number Theory	Application (Level 3)
CO4.	Analyzing the concept of numbers and its Properties	Analysis (Level 4)
CO5.	Understanding the basic concepts of Number Theory	Comprehension (Level 2)
UMTT55	**Numerical Methods**	
CO1.	Studying Principles of Least Squares	Knowledge (Level 1)
CO2.	Developing efficient algorithms for solving problems in Science, Engineering, and Technology.	Evaluation (Level 5)
CO3.	Analyzing different aspects numerical solutions of algebraic and transcendental equations	Analysis (Level 4)
CO4.	Identifying the basic concept of numerical differentiation and integration	Analysis (Level 4)
CO5.	Solving solution to simultaneous linear equations	Evaluation (Level 5)
UMTE53	**Programming in C**	
CO1.	Studying basic structure of C program	Knowledge (Level 1)
CO2.	Developing program skills in C and its object oriented concepts	Evaluation (Level 5)
CO3.	Analyzing conditional statements and loop concept	Analysis (Level 4)
CO4.	Identifying object oriented programming concept and proficient in C tokens	Evaluation (Level 5)
CO5.	Understanding C operators, class declaration and Definition and its objects	Comprehension (Level 2)
UMTS53	**Mathematical Methods**	
CO1.	Applying graphs, charts, and probability techniques on various problems	Application (Level 3)
CO2.	Developing skills in numerical and quantitative Techniques	Evaluation (Level 5)
CO3.	Creating the time taken for performing job functions	Synthesis (Level 6)
CO4.	Demonstrating various principles involved in solving mathematical problems	Analyze (Level 4)
CO5.	Evaluating various real life situations by resorting to analysis of key issues and factors	Evaluation (Level 5)

UMTT62	**Complex Analysis**	
CO1.	Introducing the concepts of complex numbers and analytic functions.	Knowledge (Level 1)
CO2.	Learning will acquire basic concepts of analytic function and its properties	Knowledge (Level 1)
CO3.	Finding integral values of complex function using residues	Evaluation (Level 5)
CO4.	Gaining knowledge of integration of complex valued function	Knowledge (Level 1)
CO5.	Solving problems of Residues Functions	Evaluation (Level 5)
UMTT63	**Operations Research II**	
CO1.	Studying to impart mathematical modelling skills through operations research techniques.	Knowledge (Level 1)
CO2.	Learning will become proficient in sequence modelling and processes in mathematics and engineering.	Knowledge (Level 1)
CO3.	Understanding the concept of Simulation	Comprehension (Level 2)
CO4.	Analyzing the basics in game theory and replacement problems	Analysis (Level 4)
CO5.	Applying the role and application of PERT/CPM for project scheduling.	Application (Level 3)
UMTT65	**Graph Theory**	
CO1.	Acquiring knowledge of different types of graphs.	Knowledge (Level 1)
CO2.	Understanding different Models of a graph	Comprehension (Level 2)
CO3.	Analyzing to solve different real life problems	Analysis (Level 4)
CO4.	Applying many techniques to solve a particular problem	Application (Level 3)
CO5.	Gaining knowledge about directed graphs.	Knowledge (Level 1)
UMTT65	**Fuzzy sets and Fuzzy Numbers**	
CO1.	Recognizing the concept of fuzzy sets and its properties.	Application (Level 3)
CO2.	Studying fuzzy sets from crisp sets.	Knowledge (Level 1)
CO3.	Analyzing various types on fuzzy sets.	Analysis (Level 4)
CO4.	Understanding the fuzzy numbers and fuzzy Lattice relations.	Comprehension (Level 2)
CO5.	Developing the concept of fuzzy sets and its properties.	Analysis (Level 4)
UMTE64	**Programming in C++**	
CO1.	Developing skills in C++ and its object oriented concepts.	Evaluation (Level 5)
CO2.	Learning will become proficient in object oriented programming concept and proficient in C++ tokens	Knowledge (Level 1)

CO3.	Studying in C++ operators	Knowledge (Level 1)
CO4.	Analyzing the C++ class declaration and definition and its objects	Analysis (Level 4)
CO5.	Solving to constructors and destructors programs	Evaluation (Level 5)
UMTS64	**Numerical Methods Lab using C++**	
CO1.	Developing skills in C++ and its object oriented concepts.	Evaluation (Level 5)
CO2.	Learning will become proficient in object oriented programming concept and proficient in C++ Language	Knowledge (Level 1)
CO3.	Applying Numerical Method concepts and writing program	Application (Level 3)
CO4.	Analyzing the C++ class declaration and definition and its objects	Analysis (Level 4)
CO5.	Applying various types of methods and solving system of Equations	Application (Level 3)

M.Sc., MATHEMATICS / PMT21	
M.Sc., (Maths) / PMT21 / PROGRAMME OUTCOMES	
POs	**Description of POs**
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PO5	Evaluating the basic foundation of the underlying theorems and proofs of Mathematics.
PO6	Developing experience investigating the real world problems and learn to how to apply mathematical ideas and models to those problems.
PO7	Analyzing the various types of problems to solving creatively and critically.

M.Sc., (Maths) / PMT21 / COURSE OUTCOMES		
	Description of COs	**Bloom's Taxonomy / Cognitive Domain**
PENT11	**Linear Algebra**	
CO1.	Comprehending a competence with the basic ideas of linear Algebra including the concepts of vector spaces, inner product spaces, modules and linear transformations	Comprehension (Level 2)
CO2.	Applying the theorems in the characteristics of linear spaces and linear transformations	Application (Level 3)

CO3.	Analysing the properties and theorems about linear spaces to specific mathematical structures that satisfy the linear space axioms	Analysis (Level 4)
CO4.	Composing the clear and accurate proofs using the concepts of linear Algebra	Evaluation (Level 5)
CO5.	Appreciating the significance of vector spaces and linear transformations	Synthesis (Level 6)
PENT12	**Real Analysis I**	
CO1.	Understanding the fundamental properties of the real numbers that lead to the formal development of real analysis	Comprehension (Level 2)
CO2.	Developing the real number system in the complex field and Euclidean spaces	Application (Level 3)
CO3.	Analysing the limits and how they are used in sequences, series, differentiation and integration	Analysis (Level 4)
CO4.	Evaluating various mathematical proofs of basic results in Continuity and connectedness	Evaluation (Level 5)
CO5.	Appreciating how abstract ideas and various methods in the derivative of a real function can be applied to important practical problems. Exhibits rigorous mathematical proofs in derivatives of Higher order	Synthesis (Level 6)
PENT13	**Differential Equations**	
CO1.	Gaining knowledge of the elements of Partial Differential Equations	Knowledge (Level 1)
CO2.	Comprehending the first order differential equations selecting from a variety of techniques	Comprehension (Level 2)
CO3.	Understanding a variety of second order differential equations, selecting from several techniques	Comprehension (Level 2)
CO4.	Applying the series solutions (and approximations) for second order linear differential equations, both at ordinary points and at regular singular point	Application (Level 3)
CO5.	Investigating the boundary values of problems and pointing out its significance	Evaluation (Level 5)
PENT14	**Graph Theory**	
CO1.	Gaining knowledge of Graph Theory with applications	
CO2.	Understanding of some network and colouring in Graphs	Comprehension (Level 2)
CO3.	Applying the atomic variable	Application (Level 3)
CO4.	Analysing the concepts of connectivity, Blocks and Hamilton cycles in the real life	Analysis (Level 4)
CO5.	Evaluating the concept and familiar with the concepts of colouring develop the reader to apply in day today life	Evaluation (Level 5)
PENE11	**Probability Theory and Statistics**	

CO1.	Gaining knowledge of the concepts of Mathematical Statistics	Knowledge (Level 1)
CO2.	Comprehending the basic concepts of statistics, probability and random variables	Comprehension (Level 2)
CO3.	Applying the concepts in finding the moments of the distributions	Application (Level 3)
CO4.	Identifying the type of the distribution and estimation	Analysis (Level 4)
CO5.	Evaluating the basics of sampling distribution theory	Evaluation (Level 5)
PENT21	**Algebra**	
CO1.	Understanding the basic ideas of algebra including the concepts of direct products, finitely generated abelian groups, Fields , extension fields , Galois theory and finite fields	Comprehension (Level 2)
CO2.	Comprehending the concepts of Permutation	Comprehension (Level 2)
CO3.	Applying the knowledge in solving problems in polynomials over the rational field	Application (Level 3)
CO4.	Analysing the knowledge of the structures of fields ,extension fields and finite fields	Analysis (Level 4)
CO5.	Evaluating the logical mathematical arguments and Solvability by radicals	Evaluation (Level 5)
PENT22	**Real Analysis - II**	
CO1.	Understanding the fundamental properties of the real numbers that lead to the formal development of real analysis	Comprehension (Level 2)
CO2.	Applying the rigorous arguments developing the theory underpinning real analysis in the Stone-Weierstrass theorem	Application (Level 3)
CO3.	Demonstrating an understanding of limits and how they are used in sequences, series, differentiation and integration	Analysis (Level 4)
CO4.	Evaluating the various mathematical proofs of basic results in implicit function theorem	Evaluation (Level 5)
CO5.	Appreciating the abstract ideas and various methods in mathematical analysis can be applied to important practical problems. Exhibits rigorous mathematical proofs in real analysis like inverse function theorem and the implicit function theorem	Synthesis (Level 6)
PENT23	**Topology**	
CO1.	Understanding the concept of topological spaces and continuous functions, concept of product topology and quotient topology	Comprehension (Level 2)
CO2.	Applying the concepts of distance between two sets, connectedness, denseness, compactness and	Application (Level 3)

	separation axioms	
CO3.	Analyzing the concepts to read and write theorem proofs in topology	Analysis (Level 4)
CO4.	Evaluating to determine that a given point in a topological space is either a limit point of not for a given subset of a topological space.	Evaluation (Level 5)
CO5.	Evaluating theorem proofs to do variety of examples and counter examples in topology	Evaluation (Level 5)
PENT24	**Optimization Techniques**	
CO1.	Comprehending the importance and value of Operations Research and mathematical modeling in solving practical problems in industry	Comprehension (Level 2)
CO2.	Applying the variables for formulating complex mathematical models in management science, industrial engineering and Transportation science and in real life	Application (Level 3)
CO3.	Analyzing a managerial decision problem and application of Dynamic Programming: Capital Budgetting Problem	Analysis (Level 4)
CO4.	Evaluating a design, improve and operate complex systems in the best possible way through empirical Queuing Models	Evaluation (Level 5)
CO5.	Appreciating the significance of Lagrangean Method – Kuhn-Tucker Method	Synthesis (Level 6)
PENE22	**Automata Theory**	
CO1.	Understanding the basic concepts in Lattices , formal language and automata theory	Comprehension (Level 2)
CO2.	Applying the abstract models of computing, including deterministic (DFA), non-deterministic (NFA), Push Down Automata(PDA)	Application (Level 3)
CO3.	Analysing theoretical knowledge relate practical problems to languages and automata	Analysis (Level 4)
CO4.	Evaluating the logic and methods behind grammars and recognizers for different formal languages	Evaluation (Level 5)
CO5.	Evaluating the structure of a given formal language using regular expressions and context free grammars and implementation of a lexical analyzer.	Evaluation (Level 5)
PENT31	**Complex Analysis**	
CO1.	Comprehending the fundamental properties of the complex numbers that lead to the development of complex analysis	Comprehension (Level 2)
CO2.	Applying and understand about limits and to know how they are used in series and problems	Application (Level 3)

CO3.	Analyzing functions of complex variable in terms of continuity, differentiability and analyticity. Apply Cauchy-Riemann equations and harmonic functions to solve problem	Analysis (Level 4)
CO4.	Evaluating the line integrals, curve integrals, singularities and determine the values of integrals using residues.	Evaluation (Level 5)
CO5.	Creating the rigorous arguments developing the theory underpinning complex analysis	Synthesis (Level 6)
PENT32	**Measure Theory**	
CO1.	Gaining knowledge of the concepts of Measure and Integration	Knowledge (Level 1)
CO2.	Understanding the basics axioms for the real numbers, natural and rational numbers as subset.	Comprehension (Level 2)
CO3.	Demonstrate the basic concepts underlying the definition of the general Lebesgue integral	Application (Level 3)
CO4.	Applying the concepts of Borel sets, measurable functions, differentiation of monotone functions	Application (Level 3)
CO5.	Analyzing about the Signed Measure and the Hahn Decomposition, integral of a non-negative function, functions of bounded variation	Analysis (Level 4)
PENT33	**Classical Dynamics**	
CO1.	Comprehending the knowledge of core principles in dynamics	Comprehension (Level 2)
CO2.	Applying the variation principle for real physical situations	Application (Level 3)
CO3.	Analysing the complex and difficult problems of classical dynamics in a systematic way	Analysis (Level 4)
CO4.	Evaluating the existing symmetries and the corresponding integrals of motion and analyze the qualitative nature of dynamics	Evaluation (Level 5)
CO5.	Creating the problem solving skills (approach, estimation, computation, and analysis) of classical mechanics in various contexts such as mechanical engineering, astrophysics, and biophysics	Synthesis (Level 6)
PENT34	**Calculus of Variations and Integral Equations**	
CO1.	Knowing the basic concepts of Calculus of Variations and Integral Equations	
CO2.	Understanding the competence with the basic ideas of The Method of Variations in Problems with fixed Boundaries	Comprehension (Level 2)
CO3.	Applying the Euler's finite difference method ,The Ritz method and Kantorovich's method in Variational Problems	Application (Level 3)
CO4.	Analysing the functional dependent on the functions of several independent variables	Analysis (Level 4)

CO5.	Evaluating the accurate proofs using the concepts of reduction to a system of Algebraic equations	Evaluation (Level 5)
PENE33	**Non Linear Differential Equations**	
CO1.	Comprehending the basic concepts linear approximation at equilibrium points	Comprehension (Level 2)
CO2.	Applying the concepts amplitude Perturbation for the pendulum equation	Application (Level 3)
CO3.	Identifying the application of Floquet Theory	Analysis (Level 4)
CO4.	Evaluating the basics Stability and Poincare stability	Evaluation (Level 5)
CO5.	Creating on estimating the Perturbation Method and Fourier series.	Synthesis (Level 6)
PENT41	**Functional Analysis**	
CO1.	Gaining knowledge of the concepts of Functional Analysis	Knowledge (Level 1)
CO2.	Understanding the properties of normed linear spaces and construct examples of such spaces	Comprehension (Level 2)
CO3.	Applying the basic theoretical techniques to analyze linear functionals and operators on Banach and Hilbert spaces	Application (Level 3)
CO4.	Analysing the Finite-Dimensional Spectral Theory survey of the situation	Analysis (Level 4)
CO5.	Evaluating the theorems to do problems	Evaluation (Level 5)
PENT42	**Differential Geometry**	
CO1.	Comprehending the concise arguments involving basic notions and constructions of 2-dimensional Riemannian geometry, curves and torsion	Comprehension (Level 2)
CO2.	Applying the important types of curves in surfaces, including principal curves, asymptotic curves and geodesics using fundamental existence theorem for space curves	Application (Level 3)
CO3.	Analyzing some standard examples in geometry, such as surfaces of constant Gaussian curvature, compact and non -compact surfaces, and surfaces of revolution	Analysis (Level 4)
CO4.	Evaluating the Gaussian and mean curvatures using variety of methods including patch computations .	Evaluation (Level 5)
CO5.	Evaluating the Differential equations of geodesics using normal property	Evaluation (Level 5)
M.Phil., MATHEMATICS / MMT21		
M.Phil., (Maths) / MMT21 / PROGRAMME OUTCOMES		
POs	**Description of POs**	
PO1	To acquire advanced conceptual knowledge and comprehensive understanding of the fundamental principles in the discipline of	

	Mathematics.
PO2	To demonstrate mastery of subject material, as evidenced by quality of performance in coursework, and on written and oral examinations in Mathematics.
PO3	To communicate mathematical ideas, results, context, and background effectively and professionally in written and oral form.
PO4	To visualize and work on laboratory multidisciplinary tasks related to current research in the fields of Mathematical, Physical and Life sciences.
PO5	To produce and defend an original contribution to knowledge, as evidenced by the writing and defence of a thesis involving significant original research.
PO6	To apply knowledge and critically evaluate the concepts and scientific developments to take up any challenge.
PO7	To employ innovative and environment friendly methods, novel ideas to solve complex and challenging societal and environmental issues.

M.Phil., (Maths) / MMT21 / COURSE OUTCOMES

	Description of COs	**Bloom's Taxonomy / Cognitive Domain**
	METT11 Research Methodology	
CO1.	Gaining knowledge on Fundamental Group and Separation Theorem in the Plane	Knowledge (Level 1)
CO2.	Comprehending the II order PDE by linear system with applications.	Comprehension (Level 2)
CO3.	Applying the gained knowledge in research methodology, advanced topology and problem solving by PDE	Application (Level 3)
CO4.	Practising thesis writing as per the procedure learnt	Synthesis (Level 6)
CO5.	Carrying out innovative researches in future	Synthesis (Level 6)
	METT12 Mathematical Methods	
CO1.	Gaining knowledge of advanced level representation theorem, fourier transforms and conformal mapping theory, problems with boundary conditions.	Application (Level K3)
CO2.	Getting acquainted with Real and Complex Analysis	Analysis (Level K4)
CO3.	Creating perfect documentation in social and science discipline by LaTeX	Knowledge (Level K1)
CO4.	Attaining more accurate results for mathematical equations through MATLAB	Evaluation (Level K5)
CO5.	Gaining multiple knowledge by problem solving method and presentation style.	Synthesis (Level K6)

MPST13	Professional Skills	
CO1.	Acquiring knowledge of communication skills with special reference to its elements, types, development and styles.	Knowledge (Level 1)
CO2.	Understanding the terms like Communication technology, Computer Mediated Teaching	Comprehension (Level 2)
CO3.	Developing skills in ICT and applying them in teaching, learning contexts and research.	Synthesis (Level 6)
CO4.	Developing Multimedia/E-contents in their respective subjects.	Synthesis (Level 6)
CO5.	Integrating Technology into Teaching and Learning	Synthesis (Level 6)