

Noorul Islam Centre for Higher Education

(Deemed to be University u/s 3 of the UGC Act 1956)

Kumaracoil, Thuckalay, Kanyakumari District - 629 180

Accredited by NAAC with 'A' Grade

MA27 Msc MATHEMATICS



Student Performance and Learning Outcomes

MA27 Msc MATHEMATICS

Programme Outcome (PO)	
PO-A	Solve intricate mathematical problems using the knowledge of pure and applied Mathematics.
PO-B	Acquaint with the recent advances in applied mathematical sciences such as numerical computations and mathematical modeling.
PO-C	Explain the knowledge of modern issues in the field of mathematics.
PO-D	Employ technology in solving and understanding mathematical problems.
PO-E	Capable of formulating and analyzing mathematical models of real life applications.
PO-F	Familiarize the student's physical intuition and thinking process through the understanding of the theory and application of this knowledge to the solution of practical problems.
PO-G	Proficiency in all lectureship exams approved by UGC.
PO-H	Pursue further studies and conduct research.
PO-I	Mathematical lifelong learning through continuous professional development.
PO-J	Solve differential equations governing real life issues.
PO-K	Acquire knowledge of mathematics and its applications in all the fields.
PO -L	Effectively communicate about their field of expertise on their activities, with their peer and society at large, such as, being able to comprehend and write effective reports and design documentation, make effective presentations.
POM	Adjust themselves completely to the demands of the growing field of Mathematics by life-long learning.

Programme Specific Outcomes (PSO)	
PSO1	Understanding of the fundamental axioms in mathematics and capability of developing ideas based on them.
PSO2	Inculcate mathematical reasoning.
PSO3	Prepare and motivate students for research studies in mathematics and related fields.
PSO4	Provide knowledge of a wide range of mathematical techniques and application of mathematical methods/tools in other scientific and engineering domains.
PSO5	Provide advanced knowledge on topics in pure mathematics, empowering the students to pursue higher degrees at reputed academic institutions.
PSO6	Good understanding of number theory which can be used in modern online cryptographic technologies.
PSO7	Nurture problem solving skills, thinking, creativity through assignments, project work.
PSO8	Assist students in preparing (personal guidance, books) for competitive exams e.g. NET, SET, etc.

Sl.No	Subject Code	Subject Name
SEMESTER II		
1.	MA2705	Algebra II
2.	MA2706	Analysis II
3.	MA2707	Numerical Analysis
4.	MA27A8	Number Theory
5.	CS27S1	Supportive Course-IOffice Automation
SEMESTER IV		
6.	MA2711	Functional Analysis
7.	MA2712	Operations Research
8.	MA2713	Graph Theory

MA2705 Algebra II	
CO1	Understand the concept of Extension fields and roots of the polynomial.
CO2	Understand the concept of Galois theory. To be able to do problems.
CO3	Understand the concept of linear transformation and able to do problems.
CO4	Understand the concept of Nilpotent transformation, Jordan form and Rational Canonical forms. To be able to find the trace and transpose.
CO5	Understand the concept of finite fields and able to do simple problems.

MA2706 Analysis II	
CO1	Able to understand about Definition and existence of Riemann Stieltjes integral and properties of the integral.
CO2	Capable to understand about Pointwise and uniform convergence, Cauchy criterion for uniform convergence, Weirstrass M-test,. Develop the ability to reflect on problems that are quite significant in the field of real analysis.
CO3	Build-up the ability to estimate the values of the functions of several variables.
CO4	Appreciate how abstract ideas and rigorous methods in mathematical analysis can be applied to important practical problems.
CO5	Construct rigorous mathematical proofs of basic results in real analysis

MA2707 Numerical Analysis	
CO1	Understand numerical techniques to find the root of transcendental and polynomial equations. Muller's method s to improve the rate of convergence. Also, compute the errors.
CO2	Understand Numerical methods to solve a system of linear algebraic equations using Pivotal Strategy.
CO3	Analyze the finite difference. Apply minimization results to the interpolation and least squares Approximation of data and functions.
CO4	To present various methods for doing numerical differentiation and integration. Also, present a general strategy for deriving such methods. Find solution errors and accuracy.
CO5	Construct a numerical method to solve ordinary differential equations in a single step and Multistep methods.

MA27A8 Number Theory	
CO1	Understand the basic concepts of numbers and to define and describe different types of functions using theorems on different functions.
CO2	Describe the concepts and applications of multiplicative functions and Dirichlet multiplicative on different kind of functions, understand the derivatives of an arithmetical functions.
CO3	Recognise the concept of big "O" notation and its application in various field of Euler Summation formula.
CO4	Understand the basic concepts of congruences, residue classes, complete residue systems and linear congruences.
CO5	Define quadratic residues, Legendre's symbol and Jacobi symbol and evaluate $(-1 p)$, $(2 p)$, $(-1 P)$ & $(2 P)$

CS27S1 Office Automation	
CO1	Acquire Knowledge in the Fundamentals of office Automation.
CO2	To gain good knowledge in preparation of documents.
CO3	To get ideas about Efficient Calculations through excel sheets.
CO4	Can be able to understand the purpose of Database and its various operations.
CO5	Creation and formatting of slides with Transition effects. Efficient slideshow through MS Powerpoint to be done.

MA2711 Functional Analysis	
CO1	Understand the terminology of Banach spaces. Distinguish which normed spaces are Banach. Evaluate continuity of linear transformations.
CO2	Understand the concepts of conjugate space and conjugate operators. Evaluate the conjugate space of given space. Finding conjugate of an operator.
CO3	Analyzing which Banach space are Hilbert space. Constructing orthonormal set. Analyse whether the given set is orthonormal.
CO4	Understand adjoint and self adjoint sets- Analysing whether an operator is normal or unitary.
CO5	Applying Finite dimensional spectral theory- Understandings spectrum concepts.

MA2712 Operations Research	
CO1	List the steps of the decision making process and describe the different types of decision making environments, Making decisions under uncertainty, under risk, calculate EMV & EVPI and develop accurate and useful trees to analyse decision tree problems.
CO2	Define a project in terms of activities such that a network can be used to describe the project, compute the critical path and the project completion time, compute the expected activity time using the activity time estimates such as optimistic, most likely and pessimistic, compute the probability of the project being completed by a specific time and understand the concept and the need for crashing.
CO3	Describe the functions and the various costs of an inventory system, the rationale behind the EOQ models and calculate the order quantity that minimizes the total cost inventory and analyze the implication of this model.
CO4	Understand the nomenclature of queuing theory, identify the various queuing models and calculate the characteristics and performance measures of a queuing system.
CO5	Recognise the necessity of replacement items and their terminologies, compute the time of replacement and average cost, apply individual and group replacement policy

MA2713 Graph Theory

CO1	Understand the concept of graph theory, path, vertex degree and trees. To be able to find cut edge and cut vertices.
CO2	To be able to find Euler path, Euler tour Hamiltonian cycle and connectivity.
CO3	Understand the concept of Matching and covering in bipartite graph. To be able to find perfect matching.
CO4	To be able to apply the concept of independent sets, cliques etc.
CO5	Understand the concept of Directed graph, Directed path and cycles. To be able to find Directed path and