Payyanur College, Payyanur
(Affiliated to Kannur University)

Programme Outcomes (POs)

MSc PROGRAMME (FOR SCIENCE)

PROGRAMME OUTCOMES (PO)

PO1. Advanced Knowledge & Skills:

Postgraduate courses aim to provide students with in-depth knowledge and advanced skills related to their chosen field. The best outcome would be to acquire a comprehensive understanding of the subject matter and develop specialized expertise.

PO2. Research & Analytical Abilities:

Research and Analytical Abilities: Postgraduate programs often emphasize research and analytical thinking. The ability to conduct independent research, analyse complex problems, and propose innovative solutions is highly valued.

PO3. Critical Thinking & Problem-Solving Skills:

Developing critical thinking skills is crucial for postgraduate students. Being able to evaluate information critically, identify patterns, and solve problems creatively are important outcomes of these programs.

PO4. Effective Communication Skills:

Strong communication skills, both written and verbal, are essential in various professional settings. Postgraduate programs should focus on enhancing communication abilities to effectively convey ideas, present research findings and engage in academic discussions.

PO5. Ethical & Professional Standards:

Graduates should uphold ethical and professional standards relevant to their field. Understanding and adhering to professional ethics and practices are important outcomes of postgraduate education.

PO6. Career Readiness:

Postgraduate programs should equip students with the necessary skills and knowledge to succeed in their chosen careers. This includes practical skills, industry-specific knowledge, and an understanding of the job market and its requirements.

PO7. Networking & Collaboration:

Building a professional network and collaborating with peers and experts in the field are valuable outcomes. These connections can lead to opportunities for research collaborations, internships and employment prospects.

PO8. Lifelong Learning:

Postgraduate education should instill a passion for lifelong learning. The ability to adapt to new developments in the field, pursue further education, and stay updated with emerging trends is a desirable outcome.

Programme Specific Outcomes (PSOs)

Name of the Programme: **MSc MATHEMATICS**

PROGRAMME SPECIFIC OUTCOMES (PSOs)

PSO1.

Inculcate and develop mathematical aptitude and train students to apply their theoretical knowledge to solve problems.

PSO2.

Develop the knowledge, skills and attitudes necessary to pursue further studies in mathematics.

PSO3.

Develop abstract, logical and critical thinking so that students can reflect critically upon their work and the work of others.

PSO4.

Appreciate the international dimension of mathematics and its multicultural and historical perspectives,

PSO5.

Develop in the student the ability to read, follow and appreciate mathematics.

PSO6.

Train students to communicate mathematical ideas in a lucid and effective manner.

PSO7.

Have a strong foundation in core areas of Mathematics both pure and applied.

PSO8.

Communicate mathematical ideas effectively, in writing as well as orally.

PSO9.

Conduct Professional and Scholarly activities efficiently.

Course Outcomes (COs)

Name of the Programme: **MSc MATHEMATICS**

COURSE OUTCOMES (COs)

Sl. No	Name of the Course	Outcomes
1.	**MSMAT01C01 ABSTRACT ALGEBRA**	CO: After successful completion of the course, student will be able to understand the basic algebraic structures such as group theory and ring theory.
2.	**MSMAT01C02 LINEAR ALGEBRA**	CO: After successful completion of the course, student will be able to understand the basic linear algebra- vector space, linear transformations and inner product spaces.
3.	**MSMAT01C03 REAL ANALYSIS**	CO: After successful completion of the course, student will be able to understand the basic real analysis- convergence, differentiation and integration
4.	**MSMAT01C04 TOPOLOGY**	CO: After successful completion of the course, student will be able to understand the topological spaces, continuous functions and connected spaces.
5.	**MSMAT01C05 ORDINARY DIFFERENTIAL EQUATIONS**	CO: After successful completion of the course, student will be able to understand the basics of differential equations and the method of solving them.
6.	**MSMAT02C06 ADVANCED ABSTRACT ALGEBRA**	CO: After successful completion of the course, student will be able to understand some topics in algebr4 including Galois theory.
7.	**MSMAT02C07 MEASURE THEORY**	CO: After successful completion of the course, student will be able to understand some topics in measure theory Lebesgue integration.
8.	**MSMAT02C08 ADVANCED REAL ANALYSIS**	CO: After successful completion of the course, student will be able to understand uniform convergence and functions of several variables.
9.	**MSMAT02C09 ADVANCED TOPOLOGY**	CO: After successful completion of the course, student will be able to understand Compactness, Separation Axioms and classical Theorems in

		topology such as Urysohn Lemma, Urysohn Metrization theorem, Tiefze Extension, TychonoffTheorem and Stone – CechCompactification.
10.	**MSMAT02C10 PDE AND INTEGRAL EQUATIONS**	CO: Upon the successful completion of the course students will learn techniques to solve first order PDE and analyse the solution to get information about the parameters involved in the model and get an idea about Integral equations.
11.	**MSMAT03C11 FUNCTIONAL ANALYSIS**	CO: After successful completion of the course, student will be able to bring together the theories of linear algebra, topology and analysis and get acquainted with the basic theories of functional analysis.
12	**MSMAT03C12 COMPLEX ANALYSIS**	CO: After successful completion of the course, student will study Cauchys theorems, residue integration and space of analytic and meromorphic functions.
13	**MSMAT03C13 DIFFERENTIAL GEOMEBRY**	CO: After successful completion of the course, student will be able to understand the basics of differential geometry and several variable calculus.
14	**MSMAT04C14 OPERATOR THEORY**	CO: After successful completion of the course, student will be able to understand the advanced level operator theory and their interplay with other branches of higher mathematics.
15	**MSMAT04C15 COMPLEX FUNCTION THEORY**	CO: After successful completion of the course, student will develop knowledge in advanced complex analysis and would be capable to apply these knowledge in solving Harmonic PDEs.
16	**MSMAT04Cl6 PROIECT/DISSERTATION**	CO: After successful completion of the project work, student will be able to snrdy or research in a topic that is beyond the regular classroom learning in both rigor and content. Further, students will be able to produce reports that exhibit both the background and the conclusions reached as a result ofsuch study or research.
CORE ELECTIVE COURSES		
17.	**MSMAT03E01 NUMBER THEORY**	CO: After successful completion of the course, student will study the basics of both Analytic and Algebraic Number Theory.

18.	**MSMAT03E02 CALCULUS OF VARIATIONS**	CO: After successful completion of the course, student will be able to understand the basic theory of calculus of variations, get acquainted with Euler equations and apply them in solving extremal problems.
19.	**MSMAT03E03 ALGEBRAIC TOPOLOGY**	CO: After successful completion of the course, student will be able to understand the basics of algebraic topology and understand the fundamental group from a different perspective.
20.	**MSMAT03E04 NUMERICAL ANALYSIS AND COMPUTING**	CO: After successful completion of the course, student will be able to understand different methods of finding numerical solutions of a system of equations.
OPEN ELECTIVE COURSES		
21.	**MSMAT03O0l GRAPH THEORY**	CO: After successful completion of the course, student will develop knowledge n connectivity in graphs, independent sets and Matchings, Edge and vertex colorings and related concepts.
22.	**MSMAT03O02 DISCRETE MATHEMATICS**	CO: After successful completion of the course, student will develop knowledge in Combinatorics and Graph theory
23.	**MSMAT03O03 OPERATIONS RESEARCH**	CO: After successful completion of the course, student will be able to understand different techniques involved in operations research.
24.	**MSMAT03O04 FUZZY MATHEMATICS**	CO: After successful completion of the course, student will be able to understand the basics of fuzzy mathematics
25.	**MSMAT03O05 CODING THEORY**	CO: After successful completion of the course, student will be able to understand the basics of coding theory.
26.	**MSMAT03O06 AUTOMATA AND FORMAL LANGUAGES**	CO: After successful completion of the course, student will be able to understand the basic theory of Automata and Formal languages.