



SARDAR PATEL UNIVERSITY

NAAC 'A' Grade (10-01-2023 To 09-01-2028)

Vallabh Vidyanagar

Gujarat

Academic Program Structure

&

Curriculum

(Aligned with NEP-2020)

M.Sc. Mathematics

(Two Years With Course Work Only)

NHEQF Level: 6.5

Entry NHEQF Level	:	5.5
Duration	:	Two Years (Four Semesters)
Total Courses	:	24
Total Learning Hours	:	2640
Total Credits	:	88
Total Marks	:	2200

Graduate Attributes (GAs):

Upon successful completion of the programme, graduates are expected to attain the following Graduate Attributes:

GA1. Advanced Disciplinary Knowledge

Demonstrate comprehensive knowledge of core and advanced areas of mathematics, including algebra, analysis, geometry, and applied mathematics.

GA2. Conceptual Understanding and Integration

Demonstrate deep conceptual understanding and interconnections among mathematical theories, structures, and methods across pure and applied domains.

GA3. Critical and Analytical Thinking

Apply logical reasoning and analytical skills to solve complex mathematical problems and evaluate mathematical arguments with precision.

GA4. Research and Inquiry Competence

Formulate mathematical problems, conduct investigations, analyse results, and develop original solutions in theoretical and applied mathematics.

GA5. Digital and Computational Proficiency

Use mathematical software, computational tools, and modern techniques for modelling, simulation, and data analysis.

GA6. Communication and Scholarly Expression

Communicate mathematical ideas, proofs, and results effectively through structured writing, presentations, and visual representations.

GA7. Ethics, Values, and Professional Integrity

Demonstrate academic honesty, ethical responsibility, and professionalism in mathematical practice and research.

GA8. Collaboration and Teamwork

Work effectively in team, demonstrating respect for diverse perspectives in academic and research environment.

GA9. Lifelong Learning and Reflective Growth

Engage in continuous learning to adapt to emerging developments in mathematics and its applications.

GA10. Value Inculcation and Outreach

Recognise ethical responsibilities and societal implications related to mathematical exposition and understanding, and data analysis.

GA11. Visualization of Mathematical Concepts

Develop original approaches such as models, through digital and online visualizations/simulations of mathematical concepts and/or solutions to theoretical and applied mathematical problems. This is also strengthened by co-curricular activities.

GA12. Autonomy, Responsibility, and Accountability

Apply mathematical knowledge and transferable skills in academic, research, professional, and interdisciplinary contexts motivating students for higher studies.

Program Educational Objectives (PEOs):

Within 3–5 years of completing the programme, graduates will be able to:

- PEO1. Demonstrate a deep understanding of core and specialized mathematical theories to solve real-world problems.
- PEO2. Apply mathematical knowledge and analytical skills in diverse professional domains such as data analysis, finance, actuarial science, and education.
- PEO3. Engage in advanced research and contribute to the development of mathematical knowledge to STEM and other areas.
- PEO4. Apply logical reasoning and mathematical modelling to design innovative solutions for industrial and technical challenges.
- PEO5. Use computational tools, software, and programming techniques efficiently for analysis and visualisation of mathematical data.
- PEO6. Apply mathematical knowledge with ethical responsibility and contribute to societal and technological development.
- PEO7. Engage in continuous learning to adapt to emerging developments in mathematics and related fields.

Program Learning Outcomes (PLOs):

Upon successful completion of the programme, learners will be able to:

- PLO1. Apply advanced concepts from core and advanced areas of mathematics to solve theoretical and applied problems including problems in other areas.
- PLO2. Analyse mathematical structures, relationships, and abstractions using rigorous logical reasoning, proofs, and counterexamples.
- PLO3. Formulate and solve complex mathematical problems using appropriate theoretical and computational methods.
- PLO4. Design and analyse mathematical models for real-world problems in science, engineering, finance, and social sciences using appropriate techniques.
- PLO5. Employ modern computational tools and mathematical programming to perform symbolic computation, numerical analysis, simulations, and algorithmic problem solving.
- PLO6. Conduct mathematical investigations and analyse results to derive valid conclusions.
- PLO7. Communicate mathematical ideas and results effectively in written, oral, and visual forms.
- PLO8. Apply ethical principles and academic integrity in mathematical work and research.

PLO9. Engage in lifelong learning to adapt to emerging developments in mathematics and allied areas.

PLO10. Apply mathematical knowledge in interdisciplinary contexts to address practical and emerging challenges and to enhance employability.



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NEP-2020 aligned Curriculum with effect from Academic Year 2026-27

M.Sc. Mathematics

Semester-I

Course Type	Course Code	Course Title	Teaching-Learning Scheme		Credits	Assessment Scheme & Marks				
			L-P-T	Total Notional Hours		Internal Assessment			External Assessment	Total Marks
						FA	SA	Total		
DSC	P2S01NCMTH01	Complex Analysis I	4-0-1	120	4	20	30	50	50	100
DSC	P2S01NCMTH02	Functions of Several Real Variables	4-0-1	120	4	20	30	50	50	100
DSC	P2S01NCMTH03	Linear Algebra	4-0-1	120	4	20	30	50	50	100
DSE (Any One)	P2S01NEMTH01	Ordinary Differential Equations	4-0-1	120	4	20	30	50	50	100
	P2S01NEMTH02	Partial Differential Equations								
DSE (Any One)	P2S01NEMTH03	Graph Theory I	4-0-1	120	4	20	30	50	50	100
	P2S01NEMTH04	Number Theory								
	P2S01NEMTH05	Mathematical Classical Mechanics								
DSE (Any One)	P2S01NEMTH06	Riemann Integration	2-0-1	60	2	10	15	25	25	50
	P2S01NEMTH07	History of Indian Mathematicians - I								
				660	22	110	165	275	275	550

DSC: Discipline Specific Core

FA: Formative Assessment

DSE: Discipline Specific Elective

SA: Summative Assessment

L: Lecture

P: Practical

T: Tutorial



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Semester-II										
Course Type	Course Code	Course Title	Teaching-Learning Scheme		Credits	Assessment Scheme & Marks				
			L-P-T	Total Notional Hours		Internal Assessment			External Assessment	Total Marks
						FA	SA	Total		
DSC	P2S02NCMTH01	Topology	4-0-1	120	4	20	30	50	50	100
DSC	P2S02NCMTH02	Lebesgue Integration Theory	4-0-1	120	4	20	30	50	50	100
DSC	P2S02NCMTH03	Rings and Fields	4-0-1	120	4	20	30	50	50	100
DSE (Any One)	P2S02NEMTH01	Ordinary Differential Equations	4-0-1	120	4	20	30	50	50	100
	P2S02NEMTH02	Partial Differential Equations								
DSE (Any One)	P2S02NEMTH03	Graph Theory I	4-0-1	120	4	20	30	50	50	100
	P2S02NEMTH04	Number Theory								
	P2S02NEMTH05	Mathematical Classical Mechanics								
DSE (Any One)	P2S02NEMTH06	Riemann Integration	2-0-1	60	2	10	15	25	25	50
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