Karmaveer Bhaurao Patil University, Satara
Faculty of Science and Technology

M.Sc. (Mathematics)

Programme and Credit Structure as per NEP2020

Title: The degree shall be titled as **'Master of Science (Mathematics)** under the Faculty of Science and Technology.

M.Sc. Sem. I & II: To be implemented from Academic Year 2024-25
M.Sc. Sem. III & IV: To be implemented from Academic Year 2025-26

Programme Outcomes for M. Sc.

PO. NO	Programme Outcomes After completing M.Sc. programme the students will be able to …….
PO-1	Understand the fundamentals and advancements of subject
PO-2	Study, plan, and conduct experiments in the labs to validate the ideas principles, and theories acquired in the classrooms
PO-3	Enhance scientific knowledge of the subject
PO-4	Define their area of focus in academia, research, and development.
PO-5	Pursue careers in various fields such as science, engineering, education, banking, business, public services, etc. or become an entrepreneur with precision, analytical thinking, innovative ideas, clarity thought, expression, and systematic approach.

PSO. NO	Programme Specific Outcomes for M.Sc. (Mathematics)
PSO-1	Apply advanced calculus concepts to analyze functions, sequences, and series, and demonstrate proficiency in the techniques of real and complex analysis.
PSO-2	Apply algebraic structures to solve mathematical problems and understand the algebraic properties of numbers, groups, rings, and fields.
PSO-3	Solve ordinary and partial differential equations, analyze dynamical systems, and apply differential equations in classical mechanics.
PSO-4	Understand topological spaces, continuity, compactness, and convergence, and apply geometric concepts to solve problems in topology and differential geometry.
PSO-5	Analyze complex functions, residues, and integrals, and apply complex analysis techniques in physics, engineering, and other fields.
PSO-6	Apply numerical methods to solve mathematical problems, simulate real-world phenomena, and analyze computational accuracy.

PSO-7	Explore properties of algebraic numbers, study number fields, and understand the connections between algebraic number theory and field theory.	
PSO-8	Solve and analyze partial differential equations and fractional differential equations, and apply them to model physical and natural phenomena.	
PSO-9	Demonstrate proficiency in research methodologies, literature review, and research paper presentation suitable for academic and professional settings.	
PSO-10	Understand and apply fuzzy logic and mathematics in modeling uncertainty, and apply mathematical techniques to real-world problems.	
PSO-11	Analyze normed vector spaces, linear operators, and functionals, and understand the applications of functional analysis in various mathematical contexts.	
PSO-12	Apply advanced combinatorial techniques, graph theory, and discrete structures to solve complex combinatorial problems.	

Semester, Credit Framework NSQF Level and Exit Points

Sr. No	Semester	Year	Year	Credits	Level	Exit Points &Award
1	Sem. I & II	2024-25	1 Year	44	6	**PG Diploma (Mathematics)**
2	Sem. III & IV	2025-26	2 Year	44	6.5	**PG Degree (Mathematics)**
			Total	**88**		**Master of Science (Mathematics)**

Credit Distribution

Sr. No	Components	1 Year Master Degree Programme			2YearMaster Degree Programme		
		Courses	Credits	%	Courses	Credits	%
	Mandatory Courses	06	24	54.55	12	48	54.55
	Elective Courses	02	04	9.09	04	08	9.09
	Mandatory Practical	02	04	9.09	04	08	9.09
	Elective Practical	02	04	9.09	03	06	6.82
	Research Methodology	01	04	9.09	01	04	4.55
	Research Project	01	04	9.09	02	10	11.36
	OJT	--	--	--	01	04	4.55
	Total (Mandatory)-(A)	**09**	**32**	**72.73**	**19**	**70**	**79.55**
	Elective	04	08	18.18	07	14	15.91
	RM	01	04	9.09	01	04	4.55
	Total - (B)	**05**	**12**	**27.27**	**01**	**04**	**4.55**
	Grand Total (A+B)	**14**	**44**	**100**	**27**	**88**	**100**

Duration:

- The program shall be a full-time program.

- The duration of program shall be One Year / Two years.

- Students will have to exit option with: - First Year (44 Credits) - PG Diploma

    Second Year (88 Credits) - Master Degree

Number of Students: A batch shall consist of not more than 50 students. An additional 20% of seats will be allotted as per Karmaveer Bhaurao Patil University, Satara Norms.

Eligibility of the Students:

- Bachelor of Science with specialization in Mathematics.
- Any other eligibility prescribed by UGC, Government of Maharashtra, Karmaveer Bhaurao Patil University, Satara.

Medium of Instruction: The medium of instruction shall be in English.

Eligibility of the Core Faculty:

- **Assistant Professor:** Master of Science with specialization in Mathematics and NET/ SET/ Ph.D.

- Associate Professor: Master of Science in Mathematics with NET/ SET/Ph.D.

- Professor: Master of Science in Mathematics with NET/ SET/Ph.D.

Eligibility for Professor of Practice or Professional Trainer:

Any other eligibility as per the Guidelines and Regulations Passed by the Board of Concerned Studies, Academic Council of the College / University and Rules and Regulations of Karmaveer Bhaurao Patil University, Satara, Government of Maharashtra, and UGC norms.

Eligibility for Adjunct Professor:

Any other eligibility as per the Guidelines and Regulations Passed by the Board of Concerned Studies, Academic Council of the College / University and Rules and Regulations of Karmaveer Bhaurao Patil University, Satara, Government of Maharashtra, and UGC norms.

Scheme of Examination & Standard of Passing:(SEE and CCE)

End Semester Exam (ESE): 60 Marks (Min 24 Marks for Passing)

Continuous Comprehensive Evaluation (CCE): 40 Marks (Min 16 Marks for Passing)

Total Marks: 100 Marks for **DSC mandatory courses**.

End Semester Exam (ESE): 30 Marks (Min 12 Marks for Passing)

Continuous Comprehensive Evaluation (CCE): 20 Marks (Min 08 Marks for Passing)

Total Marks: 50 Marks for **DSE elective courses**.

Minimum 40% Marks Required for Passing and there is a separate head of passing

as per the decision of the concerned Board of Studies or Competent Authority.

Evaluation of OJT and RP:

  i. OJT: Total 100 marks for 4 credits

       (Rubrics: Certificate = max 60 marks, Report = 20 marks, Viva = 20 marks)

  ii. RP: Total 100 marks for 4 credits

(Rubrics: Decertation = 60 marks, Presentation & Viva = 40 marks)

	M.Sc. (Mathematics) Part -I			
Semester –I				
Sr.	**Components**	**Course Code**	**Course (Subject)**	**Credits**
1	Mandatory	MMT 411	Linear Algebra	4
2	Mandatory	MMT 412	Advanced Calculus	4
3	Mandatory	MMT 413	Real Analysis	4
4	Electives	MMT 414	Classical Mechanics - E1 or Graph Theory - E2	2
5	RM	MMT 415	Research Methodology	4
6	Mandatory Lab	MMP 416	Mathematics Practical Lab – I	2
7	Electives Lab	MMP 417	Mathematics Practical Lab – II	2
			Total	**22**
Semester –II				
Sr.	**Components**	**Course Code**	**Course (Subject)**	**Credits**
1	Mandatory	MMT 421	Algebra	4
2	Mandatory	MMT 422	Topology	4
3	Mandatory	MMT 423	Complex Analysis	4
4	Electives	MMT 424	Differential Geometry - E1 or Lattice Theory- E2	2
5	RP	MMP 425	Research Project	4
6	Mandatory Lab	MMP 426	Mathematics Practical Lab – III	2
7	Electives Lab	MMP 427	Mathematics Practical Lab – IV	2
			Total	**22**

EXIT OPTION: PG Diploma with **44 Credits** after Three Year UG Degree.

M.Sc. (Mathematics) Part -II				
Semester –III				
Sr.	**Components**	**Course Code**	**Course (Subject)**	**Credits**
1	Mandatory	MMT 531	Field Theory	4
2	Mandatory	MMT 532	Integral Equations	4
3	Mandatory	MMT 533	Number Theory	4
4	Electives	MMT 534	Fuzzy Mathematics - E1 or Operations Research - E2	2
5	Mandatory Lab	MMP 535	Mathematics Practical Lab – V	2
7	RP	MMP 536	Research Project	6
			Total	**22**
Semester –IV				
Sr.	**Components**	**Course Code**	**Course (Subject)**	**Credits**
1	Mandatory	MMT 541	Functional Analysis	4
2	Mandatory	MMT 542	Advanced Discrete Mathematics	4
3	Mandatory	MMT 543	Algebraic Number Theory	4
4	Electives	MMT 544	Fractional Differential Equations - E1 or Fuzzy Relations - E2	2
5	Mandatory Lab	MMP 545	Mathematics Practical Lab – VI	2
6	Electives Lab	MMP 546	Mathematics Practical Lab – VII	2
7	OJT	MMP 547	On Job Training	4
			Total	**22**

**** PG Degree with 88 credits after Three Year UG Degree.

Chairman   Secretary   Chairman
BoS in Mathematics   Academic Council   Academic Council