Karmaveer Bhaurao Patil University, Satara

Faculty of Science and Technology

B. Sc. (Mathematics)

Programme and Credit Structure as per NEP 2020

{Ref. Government of Maharashtra letter no. एनइपी.२०२२/प्र.क.०९/विशि-३शि का ना दिनांक: १३ मार्च २०२४}

The degree shall be titled as 'Bachelor of Science (Mathematics) under the faculty of Science and Technology

B. Sc. Sem. I & II from Academic Year 2024-25
B. Sc. Sem. III & IV from Academic Year 2025-26
B. Sc. Sem. V & VI from Academic Year 2026-27
B. Sc. Sem. VII&VIII from Academic Year 2027-28

Programme Outcomes for B. Sc.

PO. No.	**Programme Outcomes** **After completing B. Sc. Programme the students will be able to…….**
PO-1	acquire a comprehensive understanding of the fundamental concepts, theories, and principles in the discipline.
PO-2	use critical thinking and reasoning to interpret data, identify patterns, and draw conclusions.
PO-3	engage in scientific inquiry and research, using appropriate methodologies to investigate questions and generate new knowledge
PO-4	gain proficiency in the use of modern tools, techniques, and technologies relevant to the scientific field
PO-5	develop the ability to effectively communicate scientific ideas and findings, both orally and in writing, to a variety of audiences.
PO-6	recognize the societal and environmental implications of scientific work and act responsibly.
PO-7	engage in interdisciplinary learning and research to address complex issues.
PO-8	foster a commitment to continuous learning and professional development
PO-9	develop the ability to work effectively in teams, contributing to collective goals while respecting diverse perspectives.
PO-10	gain an understanding of global issues and the role of science in addressing them.
PO-11	enhance the ability to think analytically, critically evaluate information, and solve complex problems.
PO-12	understand the impact of scientific activities on the environment and promote sustainability.
PSO. NO	**Programme Specific Outcomes B. Sc. (Mathematics)** **The student will be able to…**
PSO-1	gain a deep understanding of fundamental mathematical principles, theories, and methodologies.
PSO-2	apply mathematical concepts to solve complex problems in various fields such as engineering, physics, economics, and computer science.
PSO-3	develop strong analytical skills, enabling them to identify, formulate, and solve problems using mathematical reasoning.
PSO-4	approach problems logically and critically.
PSO-5	acquire proficiency in using mathematical software, programming languages, and computational tools.
PSO-6	create model, simulate, and analyze real-world problems effectively.
PSO-7	participate in research activities, fostering creativity and innovation.
PSO-8	utilize mathematical research methodologies and be capable of contributing to academic and

	industrial research projects.
PSO-9	develop the ability to communicate mathematical ideas effectively, both orally and in writing.
PSO-10	collaborate in interdisciplinary teams, combining mathematical knowledge with insights from other disciplines.
PSO-11	address societal challenges using mathematical approaches.
PSO-12	adapt to changing technologies and emerging fields that require mathematical expertise.

Semester, Credit Framework, NSQF Level and Exit Points

Sr. No.	Semester	Year	Year	Credits	Level	Exit Points &Award
1	Sem. I & II	2024-25	1Year	44	4.5	UG Certificate in Mathematics
2	Sem. III & IV	2025-26	2Year	88	5.0	UG Diploma in Mathematics
3	Sem. V &VI	2026-27	3Year	132	5.5	B. Sc. in Mathematics (UG Three Year Degree)
4	Sem. VII & VIII	2027-28	4Year	176	6.0	B. Sc. in Mathematics [Honors/Research] (UG Four Year Degree)

Credit Distribution

Sr. No.	Course	3 Year Degree Programme			4 Year Honors Degree Programme			4 Year Honors with Research Degree Programme		
		Courses (3 Yr)	Credits (3 Yr)	%	Courses (4 Yr)	Credits (4 Yr)	%	Courses (4 Yr)	Credits (4 Yr)	%
1	Major	26	52	39.39	34	80	45.45	32	72	40.91
2	Elective	04	08	6.06	08	16	9.09	08	16	9.09
3	IKS	02	04	3.03	02	04	2.27	02	04	2.27
4	VSC	04	08	6.06	04	08	4.55	04	08	4.55
5	FP	01	02	1.52	01	02	1.14	01	02	1.14
6	OJT	01	04	3.03	02	08	4.55	01	04	2.27
7	RP	00	00	0.00	00	00	00	02	12	6.82
8	SEC	03	06	4.55	03	06	3.41	03	06	3.41
9	CEP	01	02	1.52	01	02	1.14	01	02	1.14
Total (Major) (A)		**42**	**86**	**65.15**	**55**	**126**	**71.59**	**54**	**126**	**71.59**
1	Minor & RM	12	24	18.18	13	28	15.91	13	28	15.91
Total (Minor) (B)		**12**	**24**	**18.18**	**12**	**28**	**15.91**	**13**	**28**	**15.91**
1	OE	04	08	6.06	04	08	4.55	04	08	4.55
2	AEC	04	08	6.06	04	08	4.55	04	08	4.55
3	VEC	02	04	3.03	02	04	2.27	02	04	2.27
4	CC	01	02	1.52	01	02	1.14	01	02	1.14
Total (C)		**11**	**22**	**16.67**	**11**	**22**	**12.50**	**11**	**22**	**12.50**
Grand Total (A+B+C)		**65**	**132**	**100**	**79**	**176**	**100**	**78**	**176**	**100**

Duration:

- The program shall be a full-time program.
- The duration of program shall be three years for Bachelor of Science and four years for Bachelor of Science with Honors or Bachelor of Science with Research.
- Every year students will have exist option with:
- (1^{st} Year: Certificate, 2^{nd} Year: Diploma, 3^{rd} Year: Degree, 4^{th} Year: Honors / Research)
- These students are allowed to re-enter the degree program within three years and complete the degree program within the stipulated maximum period of Seven Years.

Eligibility: 12th Pass with Science, or equivalent.

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

Scheme of Examination & Standard of Passing (CCE and ESE):(As per BOS)

- 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
- Minimum 40% Marks Required for Passing and there is separate head of Passing for End Semester Examination (ESE) and Continuous Comprehensive Evaluation (CCE).
- A candidate who acquire 32 credits or more during semester – I & II shall be admitted to B. Sc. II (appear for semester – III & IV examination).
- However the candidate shall not be admitted to B.Sc. III (Semester - V) unless he/she passed in all the subjects at B.Sc. I (Semester - I & Semester - II) and acquire 32 credits or more during semester – III & IV.
- However the candidate shall not be admitted to B. Sc. IV (Semester - VII) unless he/she passed in all the subjects at B.Sc. I, B. Sc. II and B.Sc. III.
- However under the National Education Policy the rules extended by KBP University, time to time regarding ATKT will be applicable.

Eligibility of the Core Faculty:(As per BOS)

- As per rules and regulations of Karmaveer Bhaurao Patil University, Satara and Govt. of Maharashtra.

Eligibility for Professor of Practice or Professional Trainer:

Any other eligibility as per the guidelines and regulations passed by concern board of studies, academic council of the autonomous college and rules & regulations of Karmaveer Bhaurao Patil University, Satara and Government of Maharashtra and UGC norms.

Karmaveer Bhaurao Patil University, Satara

Faculty of Science and Technology

B. Sc. (Mathematics) Part-I

Semester I				
Sr. No.	**Components**	**Course Code**	**Course**	**Credits**
1	Course-I	BMT 111	Calculus	02
		BMT 112	Differential Equations	02
		BMP 113	Practical Based on BMT 111 and BMT 112	02
2	Course-II	-	DSC I, DSC II, DSP I	06
3	Course-III	-	DSC I, DSC II, DSP I	06
4	OE	BMTOE 1	Creative Writing P-I	02
5	IKS	BMTIKS 1	Introduction to Indian Knowledge System	02
			Total	**22**
Semester II				
Sr. No.	**Components**	**Course Code**	**Course**	**Credits**
1	Course-I	BMT 121	Differential Calculus	02
		BMT 122	Advanced Differential Equations	02
		BMP 123	Practical Based on BMT 121 and BMT 122	02
2	Course-II	-	DSC I, DSC II, DSP I	06
3	Course-III	-	DSC I, DSC II, DSP I	06
4	OE	BMTOE 2	Creative Writing P-II	02
5	VEC	BMTVEC 1	Democracy, Election and Indian Constitution	02
			Total	**22**
EXIT OPTION: Award of UG Certificate in Major **with 44 credits** & an additional 4 credits core NSQF Course/Internship OR Continue with Major & Minor.				

B. Sc. (Mathematics) Part-II

Semester III				
Sr. No.	**Components**	**Course Code**	**Course**	**Credits**
1	Major	BMT 231	Real Analysis	02
2	Major	BMT 232	Algebra	02
3	Major Lab III	BMP 233	Practical Based on BMT 231 and BMT 232	02
4	Minor	-	DSC V, DSC VI, DSP III	06
5	OE	BMTOE 3	Creative Writing P-III	02
6	VSC	BMTVSC 1	Data Analysis Using MATLAB	02
7	SEC	BMTSEC 1	Mathematical Computations using Advanced Excel	02
8	AEC	BMTAEC 1	English P-I	02
9	IKS	BMTIKS 2	Vedic Mathematics	02
			Total	**22**
Semester IV				
Sr. No.	**Components**	**Course Code**	**Course**	**Credits**

1	Major	BMT 241	Advanced Real Analysis	02
2	Major	BMT 242	Advanced Algebra	02
3	Major Lab IV	BMP 243	Practical Based on BMT 241 and BMT 242	02
4	Minor	-	DSC VII, DSC VIII, DSP IV	06
5	OE	BMTOE 4	Creative Writing P-IV	02
6	VSC	BMTVSC 2	Mathematical Computations Using MATLAB	02
7	SEC	BMTSEC 2	Data Visualization using Python	02
8	AEC	BMTAEC 2	English P-II	02
9	VEC	BMTVEC 2	Environmental Studies	02
			Total	**22**
EXIT OPTION: Award of UG Diploma in Major and Minor with 88 Credits & an additional 4 credits core NSQF Course/ Internship OR Continue with Major & Minor				

B. Sc. (Mathematics) Part-III

Semester V				
Sr. No.	**Components**	**Course Code**	**Course**	**Credits**
1	Major	BMT 351	Mathematical Analysis (P-IX)	02
2	Major	BMT 352	Abstract Algebra (P-X)	02
3	Major	BMT 353	Optimization Techniques (P-XI)	02
4	Electives (Any one out of two)	BMT 354	Integral Transforms (P-XI E1)	02
		BMT 354	Numerical Methods I (P-XI E2)	02
5	Major Lab	BMP 355	Mathematics Practical Lab – V	02
6	Elective Lab	BMP 356	Mathematics Practical Elective Lab – I	02
7	VSC	BMPVSC 3	MATLAB- III P-III	02
8	AEC	BMPAEC 3	English P-III	02
9	OJT	BMPOJT 1	On Job Training in Mathematics I	04
10	CEP	BMTCEP 1	Community Engagement Programme in Mathematics P-I	02
			Total	**22**
Semester VI				
Sr.	**Components**	**Course Code**	**Course**	**Credits**
1	Major	BMT 361	Metric Spaces (P-XIII)	02
2	Major	BMT 362	Linear Algebra (P-XIV)	02
3	Major	BMT 363	Complex Analysis (P-XV)	02
4	Electives (Any one out of two)	BMT 364	Discrete Mathematics (P-XVIE1)	02
		BMT 364	Numerical Methods II (P-XVIE2)	02
5	Major Lab	BMP 365	Mathematics Practical Lab – VI	02
6	Elective Lab	BMP 366	Mathematics Practical Elective Lab – II	02
7	VSC	BMPVSC 4	MATLAB-IV P-IV	02
8	SEC	BMPSEC 3	R Software P-III	02
9	FP	BMPFP 1	Field Project in Mathematics	02
10	CC	BMTCC 1	Co-curricular Course in Mathematics P-I	02
11	AEC	BMTAEC 4	English P-IV	02
			Total	**22**
EXIT OPTION: Award of UG Degree in Major with 132 credits OR Continue with Major & Minor.				

B. Sc. (Mathematics) Part-IV Honors Degree

Semester VII				
Sr. No.	**Components**	**Course Code**	**Course**	**Credits**

1	Major	BMT 471	Linear Algebra (P-XVII)	04
2	Major	BMT 472	Advanced Calculus (P-XVIII)	04
3	Major	BMT 473	Real Analysis (P-XIX)	04
4	Electives (Any one out of two)	BMT 474	Classical Mechanics (P-XXE1)	02
		BMT 474	Graph Theory (P-XXE2)	02
5	Major Lab	BMP 475	Mathematical Practical Lab – VII	02
6	Elective Lab	BMP 476	Mathematics Practical Elective Lab – III	02
7	Minor	BMT 477	Research Methodology	04
			Total	**22**
Semester VIII				
Sr.	**Components**	**Course Code**	**Course**	**Credits**
1	Major	BMT 481	Algebra (P-XXI)	04
2	Major	BMT 482	Topology (P-XXII)	04
3	Major	BMT 483	Complex Analysis (P-XXIII)	04
4	Electives (Any one out of two)	BMT 484	Differential Geometry (P-XXIVE1)	02
		BMT 484	Lattice Theory (P-XXIVE2)	02
5	Major Lab	BMP 485	Mathematics Practical Lab – VIII	02
6	Elective Lab	BMP 486	Mathematics Practical Elective Lab – IV	02
7	OJT	BMPOJT 2	On Job Training in Mathematics II	04
			Total	**22**
Award of Four year UG Honors Degree in Major and Minor with 176 credits.				

B. Sc. (Mathematics) Part-IV Honors with Research Degree

Semester VII				
Sr. No.	**Components**	**Course Code**	**Course**	**Credits**
1	Major	BMT 471	Linear Algebra (P-XVII)	04
2	Major	BMT 472	Advanced Calculus (P-XVIII)	04
3	Electives (Any one out of two)	BMT 473	Real Analysis (P-XIXE1)	04
		BMT 473	Classical Mechanics (P-XIXE2)	04
4	Major Lab	BMP 474	Mathematics Practical Lab – VII	02
5	Minor	BMT 475	Research Methodology	04
6	RP	BMPRP 1	Research Project in Mathematics I	04
			Total	**22**
Semester VIII				
Sr. No.	**Components**	**Course Code**	**Course**	**Credits**
1	Major	BMT 481	Algebra (P-XX)	04
2	Major	BMT 482	Topology (P-XXI)	04
3	Electives (Any one out of two)	BMT 483	Complex Analysis (P-XXIIE1)	04
		BMT 483	Differential Geometry (P-XXIIE2)	04
4	Major Lab	BMP 484	Mathematics Practical Lab – VIII	02
5	RP	BMPRP 2	Research Project in Mathematics II	08
			Total	**22**
Award of Four year UG Honors Degree in Major and Minor with 176 credits.				

Chairman
BoS in Mathematics

Secretary
Academic Council

Chairman
Academic Council