



# **Karmaveer Bhaurao Patil University, Satara**

## **Faculty of Science and Technology**

Department of Biotechnology

### **Programme and Credit Structure as per NEP 2020**

Title: The degree shall be titled as ‘**Master of Science (Biotechnology)**’ 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. (Biotechnology)**

<b>PO. NO</b>	<b>Programme Outcomes</b> <b>After completing M.Sc. programme the students will be able to .....</b>
<b>PO-1</b>	understand the fundamentals and advancements in various areas of Biotechnology.
<b>PO-2</b>	study, plan, and conduct experiments in the labs to validate the ideas, principles, and theories acquired in the classrooms.
<b>PO-3</b>	enhance scientific knowledge in Biotechnology.
<b>PO-4</b>	define their area of focus in academia, research, and development.
<b>PO-5</b>	pursue careers in various fields such as science, engineering, education, business, public service, etc., or become an entrepreneur with precision, analytical thinking, innovative ideas, clarity of thought, expression, and a systematic approach.

<b>PSO. NO</b>	<b>Programme Specific Outcomes</b> <b>After completing M.Sc. (Biotechnology) programme the students will be able to</b>
<b>PSO-1</b>	learn, design and perform experiments in the labs to demonstrate the concepts, principles and theories learnt in the classroom
<b>PSO-2</b>	develop the ability to apply the knowledge acquired in classroom and laboratories to specific problems in theoretical and experimental biotechnology
<b>PSO-3</b>	identify the area of interest in the academic research and development
<b>PSO-4</b>	perform job in various fields like science, engineering, education, banking, business and public service, etc. or be an entrepreneur with precision, analytical mind, innovative thinking, clarity of thought, expression, and systematic approach.
<b>PSO-5</b>	be an entrepreneur with precision, analytical mind, innovative thinking, and clarity of thought, expression and systematic approach

### 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 (Biotechnology)
2	Sem. III & IV	2025-26	2Year	44	6.5	PG Degree (Biotechnology)
			<b>Total</b>	<b>88</b>		<b>Master of Science (Biotechnology)</b>

### Credit Distribution

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

#### 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 20 students. An additional 20% of seats will be allotted as per Karmaveer Bhaurao Patil University, Satara Norms.

**Eligibility of the Students:**

- Bachelor of Science in Biotechnology, Botany, Zoology, Microbiology, Nanoscience and Technology, Biological Sciences, Life Sciences.
- 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 in Biotechnology, Microbiology, Biochemistry and NET/ SET/ Ph.D.
- **Associate Professor:** Master of Science in Biotechnology with NET/ SET/ Ph.D.
- **Professor:** Master of Science in Biotechnology 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 of Practice Professional Trainer:**

As per eligibility prescribed by UGC.

**Scheme of Examination & Standard of Passing: (ESE 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: Dissertation = 60 marks, Presentation & Viva = 40 marks)

<b>M.Sc. (Biotechnology) Part -I</b>				
<b>Semester –I</b>				
<b>Sr.</b>	<b>Components</b>	<b>Course code</b>	<b>Course (Subject)</b>	<b>Cred its</b>
1	Mandatory	MBTT 411	Advances in Cell Biology (P-I)	4
2	Mandatory	MBTT 412	Advances in Molecular Biology (P-II)	4
3	Mandatory	MBTT 413	Advances in Biological Chemistry (P-III)	4
4	Electives	MBTT 414	Advances in Microbiology (P-IV)- E1 or Clinical research & Data management (P-IV)- E2	2
5	RM	MBTT 415	Research Methodology	4
6	Mandatory Lab	MBTP 416	Lab - I Exercises in Molecular Biology, and Cell Biology	2
7	Electives Lab	MBTP 417	Lab - II Exercises in Biological Chemistry and Microbiology / Clinical research & Data management	2
			<b>Total</b>	<b>22</b>
<b>Semester –II</b>				
<b>Sr.</b>	<b>Components</b>	<b>Course code</b>	<b>Course (Subject)</b>	<b>Credits</b>
1	Mandatory	MBTT 421	Genetics (P-V)	4
2	Mandatory	MBTT 422	Immunology and Virology (P-VI)	4
3	Mandatory	MBTT 423	Plant Biotechnology (P-VII)	4
4	Electives	MBTT 424	Food Biotechnology (P-VIII)- E1 or Animal Tissue Culture (P-VIII)- E2	2
5	Mandatory Lab	MBTP 425	Lab - III Laboratory Exercises in Genetics, and Immunology	2
6	Electives Lab	MBTP 426	Lab - VI Laboratory Exercises in Plant Biotechnology and Food Biotechnology/ Animal Tissue Culture	2
7	RP	MBTP 427	Research Project	4
			<b>Total</b>	<b>22</b>

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

<b>M.Sc. (Biotechnology) Part -II</b>
---------------------------------------

<b>Semester –III</b>				
<b>Sr.</b>	<b>Components</b>	<b>Course code</b>	<b>Course (Subject)</b>	<b>Credits</b>
1	Mandatory	MBT 531	Bioprocesses and Fermentation Technology (P-IX)	4
2	Mandatory	MBT 532	Bioinformatics (P-X)	4
3	Mandatory	MBT 533	Genetic Engineering (P-XI)	4
4	Electives	MBT 534	Nano biotechnology (P-XII)- E1 or Artificial Intelligence in Biotechnology (P-XII)- E2	2
5	Mandatory Lab	MBP 535	Lab - V	2
7	RP	MBP 536	Research Project	6
			<b>Total</b>	<b>22</b>
<b>Semester –IV</b>				
<b>Sr.</b>	<b>Components</b>	<b>Course code</b>	<b>Course (Subject)</b>	<b>Credits</b>
1	Mandatory	MBT 541	Environmental Biotechnology (P-XIII)	4
2	Mandatory	MBT 542	Bio-entrepreneurship & IPR (P-XIV)	4
3	Mandatory	MBT 543	Biostatistics & Clinical research (P-XV)	4
4	Electives	MBT 544	Genomics and Proteomics (P-XVI)- E1 or Agriculture Biotechnology (P-XVI)- E2	2
5	Mandatory Lab	MBP 545	Lab - VI	2
6	OJT	MBT 546	On Job Training	4
7	Electives Lab	MBP 547	Lab -VII	2
			<b>Total</b>	<b>22</b>

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

Chairman  
BOS in Biotechnology

Secretary  
Academic Council

Chairman  
Academic Council