



**Curriculum**

**for**

**M. Tech Biochemical Engineering & Biotechnology**  
**(Post- Graduate Programme)**

## **M. Tech. Biochemical Engineering & Biotechnology**

### **Vision of the Department**

- **To develop as a Center of Excellence in Biotechnology Engineering and the preferred choice of Faculty, Student, Industry and Society at global level**

### **Mission of the Department**

- To use sophisticated techniques of modern biotechnology to strengthen and develop human resources and institutional capacity.
- To transfer know how and develop appropriate facility and training in biotechnology related subjects considering safety in biotechnology by assessing management risk.

### **Program Outcomes**

**PO1:** An ability to independently carry out research /investigation and development work to solve practical problems.

**PO2:** An ability to write and present a substantial technical report/document.

**PO3:** Students should be able to demonstrate a degree of mastery over the area as per the specialization of the program. The mastery should be at a level higher than the requirements in the appropriate bachelor program.

### **Program Educational Outcomes**

#### **PEO1:**

The Biochemical Engineering & Biotechnology students will be able to independently carry out research /investigation and development work to solve practical problems

#### **PEO2:**

The Biochemical Engineering & Biotechnology students will be able to write and present a substantial technical report/document

#### **PEO3:**

The Biochemical Engineering & Biotechnology Students will be able to demonstrate a degree of mastery over the area as per the specialization of the program. The mastery should be at a level higher than the requirements in the appropriate bachelor program

**Kolhapur Institute of Technology' College of Engineering, Kolhapur  
Teaching and Evaluation scheme for**

**M . Tech. Program in BIOCHEMICAL ENGINEERING & BIOTECHNOLOGY,**

**Semester-I**

Course Code	Course	Teaching Scheme				Evaluation Scheme			
		L	T	P	Credits	Scheme	Weightage		
							Max	Min For Passing	
PBEB0101	Advanced Bioreaction Engineering	3	1	-	4	ISE-I	10	--	40
						ISE-II	10		
						MSE	30		
						ESE	50		
PBEB0102	Advanced protein Engineering	3	1	-	4	ISE-I	10	--	40
						ISE-II	10		
						MSE	30		
						ESE	50		
PBEB0103	Advanced Microbiology & Biochemistry	3	1	-	4	ISE-I	10	--	40
						ISE-II	10		
						MSE	30		
						ESE	50		
PBEB0161	Research Methodology (Audit Course)	2	-	-	-	ISE-I	-	-	40
						ISE-II	-		
						MSE	-		
						ESE	100		
PBEB01**	Professional Elective-I	3	1	-	4	ISE-I	10	--	40
						ISE-II	10		
						MSE	30		
						ESE	50		
PBEB01**	Professional Elective-II	3	1	-	4	ISE-I	10	--	40
						ISE-II	10		
						MSE	30		
						ESE	50		
PBEB0131	Laboratory-1	-	-	2	1	ISE	50	20	20
						POE	50	20	20
PBEB0132	Laboratory-2	-	-	2	1	ISE	50	20	20
						POE	50	20	20
PBEB0141	Seminar I	-	-	2	1	ISE	100	40	40
	<b>Total</b>	<b>17</b>	<b>5</b>	<b>6</b>	<b>23</b>				

**Total Credits: 23**

**Total Contact Hours/Week: 28Hrs**

**Note: ESE: End Semester Examination, MSE: Mid Semester Examination, ISE: InSemester Evaluation.**

**Kolhapur Institute of Technology' College of Engineering, Kolhapur**  
Teaching and Evaluation scheme for  
**M. Tech. Program in BIOCHEMICAL ENGINEERING & BIOTECHNOLOGY,**  
**Semester-II**

Course Code	Course	Teaching Scheme				Evaluation Scheme			
		L	T	P	Credits	Scheme	Weightage		
PBEB0204	Bioreactor Design	3	1	-	4		Max	Min For Passing	
						ISE-I	10	--	40
						ISE-II	10		
						MSE	30		
						ESE	50		
PBEB0205	Advanced Enzyme Technology	3	1	-	4	ISE-I	10	--	40
						ISE-II	10		
						MSE	30		
						ESE	50		
PBEB0206	Bioseparations	3	1	-	4	ISE-I	10	--	40
						ISE-II	10		
						MSE	30		
						ESE	50		
PBEB0262	Biological Thermodynamics (Audit)	2		-	-	ISE-I	-	--	40
						ISE-II	-		
						MSE	-		
						ESE	100		
PBEB02**	Professional Elective III	3	1	-	4	ISE-I	10	--	40
						ISE-II	10		
						MSE	30		
						ESE	50		
PBEB02**	Professional Elective IV	3	1	-	4	ISE-I	10	--	40
						ISE-II	10		
						MSE	30		
						ESE	50		
PBEB0233	Laboratory - 3	-	-	2	1	ISE	50	20	20
						POE	50	20	20
PBEB0234	Laboratory -4	1	-	2	2	ISE	50	20	20
						POE	50	20	20
PBEB0241	Seminar II	-	-	2	1	ISE	100	40	40
PBEB0242	Miniproject			2	1	ISE	100	40	40
Total		18	5	8	25				

**Total Credits: 25**

**Total Contact Hours/Week: 31Hrs**

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**Kolhapur Institute of Technology' College of Engineering, Kolhapur**  
Teaching and Evaluation scheme for  
**M . Tech. Program in BIOCHEMICAL ENGINEERING & BIOTECHNOLOGY,**  
**Semester-III**

Cours e Code	Course	Teaching Scheme					Evaluation Scheme	
		L	T	P	Credit	Component	Weightage	
							Max	Min For Passing
PBEB0343	Industrial Training (During Summer Term)	-	-	2	2	ISE I	50	20
PBEB0351	Dissertation I	-	-	5	2	ISE-I	50	20
		-	-		4	ISE-II	100	40
PBEB0352	Dissertation II	-	-		4	ESE(OE)	100	40
	TOTAL			7	12		300	120
						Total Credit: 12 Average Contact Hours/Week/Student: 7 hrs		

**Kolhapur Institute of Technology' College of Engineering, Kolhapur**  
**Teaching and Evaluation scheme for**  
**M. Tech. Program in BIOCHEMICAL ENGINEERING & BIOTECHNOLOGY,**

**Semester-IV**

Subject Code	Subject	Teaching Scheme				Evaluation Scheme		
		L	T	P	Credit	Scheme	Weightage	
							Max	Min For Passing
PBEB0453	Dissertation III	-	-	5	4	ISE-III	100	40
		-	-		4	ISE-IV	100	40
PBEB0454	Dissertation IV	-	-		8	ESE(OE)	200	80
	<b>Total</b>			<b>5</b>	<b>16</b>		<b>400</b>	<b>160</b>
						<b>Total Credit: 16 Average Contact Hours/Week/Student: 5 hrs</b>		

**List of Professional Electives**

<b>Course Code**</b>	<b>Professional Elective</b>
<b>Elective – I</b>	
PBEB0121	Immunotechnology
PBEB0122	Advanced Food Technology
PBEB0123	Environmental Biotechnology
<b>Elective – II</b>	
PBEB0124	Plant Biotechnology
PBEB0125	Pharmaceutical Biotechnology
PBEB0126	Advanced Bioinformatics
<b>Elective – III</b>	
PBEB0221	Animal Biotechnology
PBEB0222	GMP, IPR Biosafety & Bioethics
PBEB0223	Advanced Genetic Engineering
<b>Elective – VI</b>	
PBEB0224	Project management & plant design
PBEB0225	Modeling & simulation of Bioprocesses
PBEB0226	Metabolic Engineering

**Kolhapur Institute of Technology's College of Engineering, Kolhapur**  
**Proposed Program Credit Distribution**

Curriculum Component	Credits
Credit courses	32
Professional Electives	16
Lab courses	5
Seminar	2
Industrial training	2
Dissertation	26
Miniproject	1
<b>Total</b>	<b>76</b>

