



**INDIAN INSTITUTE OF TECHNOLOGY MADRAS  
CHENNAI 600 036**

**Curriculum for  
M.Tech. Degree Programme  
2021 Batch**

**Branch Code: BT4**  
**M.Tech. in BIOPROCESS ENGINEERING**  
**2021 Batch**

**I semester**

S.No		Course	Credits	Core/Elective
1	BT2061	Biochemical Thermodynamics	10	Core
2	BT5071	Bioreactor Design and Analysis	10	Core
3	BT5051	Transport Phenomena	10	Core
4	BT5111	Bioprocess Engineering Laboratory I	3	Core
5		Professional Elective 1	9	Elective
6		Free Elective 1	9	Elective
		<b>Total credits</b>	<b>51</b>	

**II semester**

S.No		Course	Credits	Core/Elective
1	BT5041	Downstream Processing	10	Core
2	BT5210	Bioprocess Control	9	Core
6	BT5121	Bioprocess Engineering Laboratory II	3	Core
3		Professional Elective 2	9	Elective
4		Professional Elective 3	9	Elective
5		Free Elective 2	9	Elective
		<b>Total credits</b>	<b>49</b>	

**Summer**

S.No		Course	Credits	Core/Elective
1	BT5931	Project	20	Core
		<b>Total credits</b>	<b>20</b>	

**III semester**

S.No		Course	Credits	Core/Elective
1	BT5932	Project	40	Core
		<b>Total credits</b>	<b>40</b>	

**IV Semester**

S.No		Course	Credits	Core/Elective
1	BT5933	Project	40	Core
		<b>Total credits</b>	<b>40</b>	

Semester	I	II	Summer	III	IV	Total
<b>Credits</b>	<b>51</b>	<b>49</b>	<b>20</b>	<b>40</b>	<b>40</b>	<b>200</b>

List of professional electives

1. Fermentation Technology	8. Computational Systems Biology
2. Plant Cell Bioprocessing	9. Reactive Species in Medical and Related Tech
3. Tissue Engineering	10. Biomaterials Engineering
4. Metabolic Engineering	11. Drug Delivery
5. Computer Simulations of Biomolecular Systems	12. Bioprocess Modeling and Simulation
6. Biosensors and Instrumentation	13. Bioprocess Equipment Design
7. Molecular Modeling and Drug Design	14. Unit Operations in Biochemical Engg.
	15. Advanced Bioprocess Technology

Any other appropriate courses from other departments

- In MTech Bioprocess Engineering program, students will undergo course work for one year (5 core subjects, 1 Lab and 5 electives) and carry out an intensive project in the second year (12 months).
- At the end of 1<sup>st</sup> year, the student can appear for a comprehensive examination. Upon successfully clearing this exam, the student can upgrade to a PhD. At the end of the PhD, the student will be awarded both MTech and PhD degrees as per the existing institute norms.

**Branch Code: BT2**  
**M.Tech. in CLINICAL ENGINEERING**  
**2021 Batch**

**Semester I (August-December) @ IIT-Madras**

S.No	Course No	Course Name	L	T	E	P	O	C	TH
1	BT6540	Cellular,Molecular Biology & Genetic Engg	3	0	0	0	6	9	9
2	AM5010	Biomechanics	3	0	0	0	6	9	9
3	ID6020	Intro to Research	2	0	0	0	4	6	6
4	MS5260	Management Science+	4	0	0	0	8	6	12
5		Engg Elective*	3	0	0	0	6	9	9
6		Engg Elective*	3	0	0	0	6	9	9
		<b>Total Credits</b>						<b>48</b>	

\* Open elective from following department - Aerospace Engineering, Applied Mechanics, Chemical Engineering, Computer Science and Engineering, Electrical Engineering, Engineering Design, Mechanical Engineering, Metallurgical and Materials Engineering and Physics

+ Electives pertaining to maintenance management, supply chain, QC, finance

**Semester II (January-July) @ CMC-Vellore**

S.No	Course No	Course Name	Credit
1	.....	Functional Anatomy & Physiology	4
2	.....	Anatomy & Physiology Lab	2
3	.....	Biomedical Imaging Systems	3
4	.....	Clinical Attachment	4
5	.....	Transducers & Instrumentation	3
6	.....	Elective	3
		<b>Total Credits</b>	<b>19</b>
		<b>Equivalent IIT-M credits</b>	<b>57</b>

**Semester III (August-December) @ SCTIMST-Tvm**

S.No	Course No	Course Name	Credit
1	.....	Medical Device Technology	3
2	.....	Biomaterials	3
3	.....	Clinical Engg, Health Systems & Mgmt	3
4	.....	Elective	3
5	.....	Design Tools for ClinEngg - Lab	2
6	.....	Engg Problems in Hospitals - Lab	2
7	.....	Clinical Attachment	4
8	.....	Clinical Engg Internship - External	2
		<b>Total Credits</b>	<b>22</b>
		<b>Equivalent IIT-M credits</b>	<b>66</b>

**Semester IV (January-June)**

S.No	Course No	Course Name	L	T	E	P	O	C	TH
1	BT6910	Project	0	0	0	0	0	20	20
		<b>Total Credits</b>						<b>20</b>	

Semester	I	II	III	IV	Total
<b>Credits</b>	<b>48</b>	<b>57</b>	<b>66</b>	<b>20</b>	<b>191</b>