

ACADEMIC CURRICULA

POST GRADUATE DEGREE PROGRAMMES

Master of Technology

(Choice Based Flexible Credit System)

Regulations 2021

Volume – 21 Curriculum



SRM

INSTITUTE OF SCIENCE & TECHNOLOGY
(Deemed to be University u/s 3 of UGC Act, 1956)

SRM INSTITUTE OF SCIENCE AND TECHNOLOGY

(Deemed to be University u/s 3 of UGC Act, 1956)

Kattankulathur, Chengalpattu District 603203,

Tamil Nadu, India

6. M.Tech in Biotechnology

6. (a) Department Vision Statement

Stmnt - 1	<i>To develop as a department of eminence, delivering distinctive learning skills in biotechnology</i>
Stmnt - 2	<i>To enable excellence in professional competence and innovation in the field of Biotechnology</i>
Stmnt - 3	<i>To develop biotechnological solutions for the betterment of society and mankind.</i>

6. (b) Department Mission Statement

Stmnt - 1	<i>To adopt effective teaching methods to improve the learning process and impart knowledge of biology and technology.</i>
Stmnt - 2	<i>To provide hands-on training and technical skills to transform students into technocrats and facilitate research and higher education in the fields of biotechnology.</i>
Stmnt - 3	<i>To pursue and promote cutting-edge research in selected fields of biotechnology</i>

6. (c) Program Education Objectives (PEO)

PEO - 1	<i>Graduates will be well-versed in core areas of biotechnology, able to apply their knowledge to solve complex problems in biotechnology and related fields and be prepared for lifelong learning and advanced study.</i>
PEO - 2	<i>Graduates will engage in research and development activities, contributing to scientific advancements and innovative solutions in biotechnology, healthcare, agriculture, or related sectors.</i>
PEO - 3	<i>Graduates will demonstrate professionalism, ethical conduct, and communication skills, contributing positively to their organizations and society</i>
PEO - 4	<i>Graduates will work effectively in multidisciplinary teams, integrating knowledge from various fields to address complex biotechnological challenges</i>
PEO - 5	<i>Graduates will evaluate the impact of biotechnological solutions in a global, economic, environmental, and societal context, promoting sustainable development</i>

6. (d) Consistency of PEO's with Mission of the Department

	Mission Stmnt. - 1	Mission Stmnt. - 2	Mission Stmnt. - 3
PEO - 1	3	3	2
PEO - 2	3	3	3
PEO - 3	3	3	3
PEO - 4	3	3	3
PEO - 5	3	2	2

6. (e) PO – Program Outcomes

PO - 1	<i>An ability to independently carry out research /investigation and development work to solve practical problems.</i>
PO - 2	<i>An ability to write and present a substantial technical report/document.</i>
PO - 3	<i>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.</i>

6. (f) Consistency of PEO's with Program Outcomes (PO)

	Program Outcomes (PO)		
	1	2	3
PEO - 1	3	3	2
PEO - 2	3	3	2
PEO - 3	3	2	2
PEO - 4	3	2	2
PEO - 5	3	2	2

3 – High Correlation, 2 – Medium Correlation, 1 – Low Correlation

6. (g) Programme Structure: M.Tech in Biotechnology

Professional Core Courses (C)						Professional Elective Courses (E)					
Course Code	Course Title	Hours/Week			C	Course Code	Course Title	Hours/Week			C
		L	T	P				L	T	P	
21BTC501J	Biomolecules	3	0	2	4	21BTE501T	Tissue Engineering	3	0	0	3
21BTC502J ²	Bioprocess Technology	3	0	2	4	21BTE502T	Stem Cell Technology and Therapeutic Applications	3	0	0	
21BTC503T	Immunology and Immunopathology	3	0	0	3	21BTE503T	Animal Cell as Bioreactors	3	0	0	3
21BTC504J	Gene Manipulations and Genome Analysis	3	0	2	4	21BTE504T	Clinical Endocrinology	3	0	0	
21BTC505J	Modeling and Simulation in Bioprocess Engineering	3	0	2	4	21BTE505T	Biomolecular and Bioanalytical Techniques	3	0	0	3
21IPC501J ²	Research Methodology	2	1	2	4	21BTE506T	Proteomics	3	0	0	
21BTC601T ¹	Case Studies	3	0	0	3	21BTE507T	Bioremediation and Biodeterioration Technologies	3	0	0	3
Total Credits					26	21BTE508T ³	Biotreatment Technologies and Regulation for Industrial Waste	3	0	0	
						21BTE601T	Computational and Artificial Intelligence in Bioprocess Engineering	3	0	0	3
						21BTE602T	Membrane Technology	3	0	0	
						21BTE603T	Plant Food and Human Health	3	0	0	3
						21BTE604T	Medicinal Plants and Plant-Microbe Interaction	3	0	0	
						21BTE600T ¹	Journal Publication	0	0	0	3
						21BTE605T	Biofuels and Biorefineries	3	0	0	
						21BTE606T	Circular Bioeconomy for Industrial Sustainability	3	0	0	3
						Total Credits					21
						Open Elective Courses (O)					
Course Code	Course Title	Hours/Week			C	Course Code	Course Title	Hours/Week			C
		L	T	P				L	T	P	
21BTC502J ²	Bioprocess Technology	3	0	2	4	21BTO601T	Molecular mechanism of Immune responses	3	0	0	3
21IPC501J ²	Research Methodology	2	1	2	4	Total Credits					3
						100% assessment by the Department (¹)					
Course Code	Course Title	Hours/Week			C	Course Code	Course Title	Hours/Week			C
		L	T	P				L	T	P	
21BTE508T ³	Biotreatment Technologies and regulation for Industrial waste	3	0	0	3	21BTC601T ¹	Case Studies	3	0	0	3
						21BTE600T ¹	Journal Publication	0	0	0	3

All elective courses may be studied under MOOC platform

¹ 100% assessment by the Department

² Assessment by Open Book Examination

³ Course Delivery through online mode

6. (h) Implementation Plan: M.Tech in Biotechnology

Semester - I						Semester - II					
Code	Course Title	Hours/Week				Code	Course Title	Hours/Week			
		L	T	P	C			L	T	P	C
21BTC501J	Biomolecules	3	0	2	4	21BTC504J	Gene Manipulations and Genome Analysis	3	0	2	4
21BTC502J ²	Bioprocess Technology	3	0	2	4	21BTC505J	Modeling and Simulation in Bioprocess Engineering	3	0	2	4
21BTC503T	Immunology and Immunopathology	3	0	0	3	21BTE503T	Animal Cell as Bioreactors	3	0	0	3
21IPC501J ²	Research Methodology	2	1	2	4	21BTE504T	Clinical Endocrinology	3	0	0	3
21BTE501T	Tissue Engineering	3	0	0		21BTE505T	Biomolecular and Bioanalytical Techniques	3	0	0	3
21BTE502T	Stem Cell Technology and Therapeutic Applications	3	0	0	3	21BTE506T	Proteomics	3	0	0	3
Total Credits					18	21BTE507T	Bioremediation and Biodeterioration Technologies	3	0	0	3
Semester - III						21BTE508T ³	Biotreatment Technologies and Regulation for Industrial Waste	3	0	0	3
Code	Course Title	Hours/Week				Total Credits					
		L	T	P	C	17					
	Open Elective	3	0	0	3	Semester - IV					
21BTE601T	Computational and Artificial Intelligence in Bioprocess Engineering	3	0	0	3	Code	Course Title	Hours/Week			
21BTE602T	Membrane Technology	3	0	0				L	T	P	C
21BTE603T	Plant Food and Human Health	3	0	0		21BTP501L	Specialization Project (OR)	0	0	40	20
21BTE604T	Medicinal Plants and Plant-Microbe Interaction	3	0	0	3	21BTP502L	Specialization Project	0	0	30	15
21BTE600T ¹	Journal Publication	0	0	0		21BTP503L	Domain Internship	0	0	10	5
21BTE605T	Biofuels and Biorefineries	3	0	0		Total Credits					20
21BTE606T	Circular Bioeconomy for Industrial Sustainability	3	0	0	3	Semester - IV					
21BTC601T ¹	Case Studies	3	0	0	3	Total Credits					
Total Credits					15						

Students must register either 21BTP501L or 21BTP502L and 21BTP503L both in fourth semester

6. (i) Program Articulation Matrix: M.Tech in Biotechnology

Course Code	Course Name	Programme Outcomes		
		1	2	3
21BTC501J	Biomolecules	2.6	2.4	2.4
21BTC502J	Bio process Technology	3	2.5	3
21BTC503T	Immunology and Immunopathology	3	2	3
21BTC504J	Gene Manipulation and Genome analysis	2.6	2.3	2.5
21BTC505J	Modeling and Simulation in Bioprocess Engineering	2.0	2.0	2.2
21BTC601T	Case Studies			
21BTE501T	Tissue Engineering	2.0	2.2	2.0
21BTE502T	Stem Cell Technology and Therapeutic Applications	2.0	2.6	2.0
21BTE503T	Animal cell as Bioreactors	2.2	2.2	2.2
21BTE504T	Clinical Endocrinology	2.6	0.0	2.2
21BTE505T	Biomolecular and Bioanalytical Techniques	1.8	2.8	2.6
21BTE506T	Proteomics	2.4	2.0	2.0
21BTE507T	Bioremediation and Biodeterioration Technologies	1.8	2.6	3.0
21BTE508T	Biotreatment Technologies and regulation for Industrial waste	2.4	2.8	3.0
21BTE601T	Computational and Artificial Intelligence in Bioprocess Engineering	2.8	2.0	3.0
21BTE602T	Membrane Technology	2.4	2.6	2.8
21BTE603T	Plant Food and Human Health	2.6	2.3	2.5
21BTE604T	Medicinal Plants and Plant-Microbe Interaction	2.5	2.5	2.8
21BTE600T	Journal Publication			
21BTE605T	Biofuels and Biorefineries	1.8	2.8	2.6
21BTE606T	Circular Bioeconomy for Industrial Sustainability	2.2	2.6	2.6
21IPC501J	Research Methodology	3	2.6	
	Open Elective			
21BTP501L	Specialization Project			
21BTP502L	Specialization Project			
21BTP503L	Domain Internship			
Program Average		2.4	2.3	2.5



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