

ACADEMIC CURRICULA
UNDERGRADUATE/ INTEGRATED
POST GRADUATE DEGREE
PROGRAMMES

(With exit option of Diploma)

(Choice Based Flexible Credit System)

Regulations 2021

Volume – 1

(Revised on July 2024)



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

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Kattankulathur, Chengalpattu District 603203,

Tamil Nadu, India

11. B.Tech. in Biotechnology with Specialization in Genetic Engineering

11. (a) Mission of the Department

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

11. (b) Program Educational Objectives (PEO)

PEO – 1	To acquire adequate knowledge and expertise in genetic engineering for higher education and research
PEO – 2	To identify, analyze, and learn strategies to solve genetic engineering problems
PEO – 3	To advance professionally as genetic engineers, who can contribute to betterment of society and be involved in life-long learning

11. (c) Mission of the Department to Program Educational Objectives (PEO) Mapping

	Mission Stmt. - 1	Mission Stmt. - 2	Mission Stmt. - 3
PEO - 1	3	3	3
PEO - 2	2	3	3
PEO - 3	3	3	3

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

11. (d) Mapping Program Educational Objectives (PEO) to Program Outcomes (PO)

	Program Outcomes (PO)												Program Specific Outcomes (PSO)		
	1	2	3	4	5	6	7	8	9	10	11	12	PSO-1	PSO-2	PSO-3
	Engineering Knowledge	Problem Analysis	Design/development of solutions	Conduct investigations of complex problems	Modern Tool Usage	The engineer and society	Environment & Sustainability	Ethics	Individual & Team Work	Communication	Project Mgt. & Finance	Life Long Learning			
PEO - 1	3	3	3	3	3	2	3	3	3	3	3	3	3	3	3
PEO - 2	3	3	3	3	3	2	2	3	3	3	3	3	3	3	3
PEO - 3	3	3	3	3	3	2	3	3	3	3	3	3	3	3	3

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

PSO – Program Specific Outcomes (PSO)

PSO - 1	Gain knowledge on different approaches utilized in genetic engineering
PSO - 2	Ability to solve clinical, industrial and agricultural problems in genetic Engineering
PSO - 3	Emerge as professionals who can develop new strategies in the genetic engineering research for the benefit of society

11. (e) Program Structure: B.Tech. in Biotechnology with Specialization in Genetic Engineering

Humanities & Social Sciences including Management Courses (H)						
Course Code	Course Title	Hours / Week			C	
		L	T	P		
21LEH101T	Communicative English	2	1	0	3	
21LEH102T	Chinese	2	1	0	3	
21LEH103T	French					
21LEH104T	German					
21LEH105T	Japanese					
21LEH106T	Korean					
21LEH107T	Spanish					
21LEH108T	Russian					
21GNH101J	Philosophy of Engineering	1	0	2	2	
21PDH209T ¹	Social Engineering	2	0	0	2	
21GNH401T	Behavioral psychology	2	1	0	3	
Total Credits 13						
Engineering Science Courses (S)						
Course Code	Course Title	Hours / Week			C	
		L	T	P		
21CSS101J	Programming for Problem Solving	3	0	2	4	
21MES101L ¹	Basic Civil and Mechanical Workshop	0	0	4	2	
21MES102L ¹	Engineering Graphics and Design	0	0	4	2	
21EES101T	Electrical and Electronics Engineering	3	1	0	4	
21DCS201P ¹	Design Thinking and Methodology	1	2	0	3	
21CHS251T	Basic Chemical Engineering	3	0	0	3	
21CHS252J	Chemical Engineering Principles	3	0	2	4	
21CSS303T	Data Science	1	1	0	2	
Total Credits 24						
Non Credit Courses (M)						
Course Code	Course Title	Hours / Week			C	
		L	T	P		
21PDM101L ¹	Professional Skills and Practices	0	0	2	0	
21PDM102L ¹	General Aptitude	0	0	2		
21PDM201L ¹	Verbal Reasoning	0	0	2		
21PDM202L ¹	Critical and Creative Thinking Skills	0	0	2		
21PDM301L ¹	Analytical and logical Thinking Skills	0	0	2		
21PDM302L ¹	Employability Skill and Practices	0	0	2		
21CYM101T ¹	Environmental Science	1	0	0		
21LEM101T ¹	Constitution of India	1	0	0	3	
21LEM102T ¹	Universal Human Values – Introduction	1	0	0		
21LEM201T ¹	Professional Ethics	1	0	0		
21LEM202T ¹	Universal Human Values-II: Understanding Harmony and Ethical Human Conduct	2	1	0		
21LEM301T ¹	Indian Art Form	1	0	0		
21LEM302T ¹	Indian Traditional knowledge	1	0	0		
21BTM191T ¹	Bioethics and IPR	1	0	0		
21GNM101L ¹	Physical and Mental health using Yoga	0	0	2	0	
21GNM102L ¹	National Service Scheme					
21GNM103L ¹	National Cadet Corps					
21GNM104L ¹	National Sports Organization					
Total Credits 03						
Basic Science Courses (B)						
Course Code	Course Title	Hours / Week			C	
		L	T	P		
21PYB101J	Physics: Electromagnetic Theory, Quantum Mechanics, Waves and Optics	3	1	2	5	
21CYB101J	Chemistry	3	1	2	5	
21MAB101T	Calculus and Linear Algebra	3	1	0	4	
21MAB102T	Advanced Calculus and Complex Analysis	3	1	0	4	
21MAB303T	Biostatistics for Biotechnologists	3	1	0	4	
21BTB105T	Cell Biology	2	0	0	2	
Total Credits 24						
Professional Core Courses (C)						
Course Code	Course Title	Hours / Week			C	
		L	T	P		
21BTC101T	Biochemistry	3	0	0	3	
21BTC201L ¹	Biochemistry Laboratory	0	0	4	2	
21BTC202T	Microbiology	3	0	0	3	
21BTC203L ¹	Cell and Microbiology Laboratory	0	0	4	2	
21BTC204T	Bioprocess Principles	3	0	0	3	
21BTC205L ¹	Bioprocess Principles Laboratory	0	0	4	2	
21BTC206T	Genetics and Cytogenetics	3	0	0	3	
21BTC207T	Molecular Biology	3	0	0	3	
21BTC208L ¹	Molecular Biology Laboratory	0	0	4	2	
21BTC209T ²	Bioprocess Engineering	3	0	0	3	
21BTC210L ¹	Bioprocess Engineering Laboratory	0	0	4	2	
21CSC206T	Artificial Intelligence	3	0	0	3	
21BTC301J	Gene Manipulation and Genomics	3	0	2	4	
21BTC302J	Immunology	3	0	2	4	
21BTC303T	Protein Engineering	3	0	0	3	
21BTC304T	Animal Biotechnology	3	0	0	3	
21BTC305L ¹	Animal Biotechnology Laboratory	0	0	4	2	
21BTC306T	Plant Biotechnology	3	0	0	3	
21BTC401L ¹	Plant Biotechnology Laboratory	0	0	4	2	
21BTC402J	Bio Separation Technology	3	0	2	4	
Total Credits 56						
Open Elective Courses (O) (Any 3 Courses)						
Course Code	Course Title	Hours / Week			C	
		L	T	P		
21GEO101T	Behavioral Biology	3	0	0	3	
21GEO102T	Microbes and Society	3	0	0	3	
21GEO103T	Biofertilizers- An Entrepreneurial Perspective	3	0	0	3	
21GEO104T	Computational Genomics	3	0	0	3	
21GEO105T	Biology for Everyday Life	3	0	0	3	
Total Credits 09						
Professional Elective Courses (E) (Any 5 Courses)						
Course Code	Course Title	Hours / Week				

11. (g) Implementation Plan: B.Tech. in Biotechnology with Specialization in Genetic Engineering

Semester – I							
Course Code	Course Title	Hours / Week					
		L	T	P	C		
21LEH101T	Communicative English	2	1	0	3		
21MAB101T	Calculus and Linear Algebra	3	1	0	4		
21PYB101J	Physics: Electromagnetic Theory, Quantum Mechanics, Waves and Optics	3	1	2	5		
21MES102L ¹	Engineering Graphics and Design	0	0	4	2		
21EES101T	Electrical and Electronics Engineering	3	1	0	4		
21CYM101T ¹	Environmental Science*	1	0	0	0		
21PDM101L ¹	Professional Skills and Practices	0	0	2	0		
21LEM101T ¹	Constitution of India	1	0	0	0		
Total Credits						18	
Semester – II							
Course Code	Course Title	Hours / Week					
		L	T	P	C		
21LEH102T	Chinese						
21LEH103T	French						
21LEH104T	German						
21LEH105T	Japanese	2	1	0	3		
21LEH106T	Korean						
21LEH107T	Spanish						
21LEH108T	Russian						
21GNH101J	Philosophy of Engineering	1	0	2	2		
21MAB102T	Advanced Calculus and Complex Analysis	3	1	0	4		
21CYB101J	Chemistry	3	1	2	5		
21BTB105T	Cell Biology	2	0	0	2		
21CSS101J	Programming for Problem Solving	3	0	2	4		
21BTC101T	Biochemistry	3	0	0	3		
21MES101L ¹	Basic Civil and Mechanical Workshop	0	0	4	2		
21PDM102L ¹	General Aptitude	0	0	2	0		
21GNM101L ¹	Physical and Mental Health using Yoga						
21GNM102L ¹	National Service Scheme	0	0	2	0		
21GNM103L ¹	National Cadet Corps						
21GNM104L ¹	National Sports Organization						
Total Credits						25	
Semester – III							
Course Code	Course Title	Hours / Week					
		L	T	P	C		
21CHS251T	Basic Chemical Engineering	3	0	0	3		
21PDH209T ¹	Social Engineering	2	0	0	2		
21BTC201L ¹	Biochemistry Laboratory	0	0	4	2		
21BTC202T	Microbiology	3	0	0	3		
21BTC203L ¹	Cell and Microbiology Laboratory	0	0	4	2		
21BTC204T	Bioprocess Principles	3	0	0	3		
21BTC205L ¹	Bioprocess Principles Laboratory	0	0	4	2		
21BTC206T	Genetics and Cytogenetics	3	0	0	3		
21LEM201T ¹	Professional Ethics	1	0	0	0		
21PDM201L ¹	Verbal Reasoning	0	0	2	0		
21LEM202T ¹	Universal Human Values-II: Understanding Harmony and Ethical Human Conduct	2	1	0	3		
Total Credits						23	
Semester – IV							
Course Code	Course Title	Hours / Week					
		L	T	P	C		
21CHS252J	Chemical Engineering Principles	3	0	2	4		
21CSC206T	Artificial Intelligence	3	0	0	3		
21BTC207T	Molecular Biology	3	0	0	3		
21BTC208L ¹	Molecular Biology Laboratory	0	0	4	2		
21BTC209T ²	Bioprocess Engineering	3	0	0	3		
21BTC210L ¹	Bioprocess Engineering Laboratory	0	0	4	2		
E	Professional Elective – I				3		
21DCS201P ¹	Design Thinking and Methodology	1	2	0	3		
21PDM202L ¹	Critical and Creative Thinking Skills	0	0	2	0		
Total Credits						23	
Semester – V							
Course Code	Course Title	Hours / Week					
		L	T	P	C		
21MAB303T	Biostatistics for Biotechnologists	3	1	0	4		
21BTC301J	Gene Manipulation and Genomics	3	0	2	4		
21BTC302J	Immunology	3	0	2	4		
21BTC303T	Protein Engineering	3	0	0	3		
E	Professional Elective – II				3		
O	Open Elective – I				3		
21GNP301L ¹	Community Connect	0	0	2	1		
21PDM301L ¹	Analytical and Logical Thinking Skills	0	0	2	0		
21LEM301T ¹	Indian Art Form	1	0	0	0		
Total Credits						22	
Semester – VI							
Course Code	Course Title	Hours / Week					
		L	T	P	C		
21CSS303T	Data Science	1	1	0	2		
21BTC304T	Animal Biotechnology	3	0	0	3		
21BTC305L ¹	Animal Biotechnology Laboratory	0	0	4	2		
21BTC306T	Plant Biotechnology	3	0	0	3		
E	Professional Elective – III				3		
O	Open Elective – II				3		
21BTP302L ¹	Project	0	0	6	3		
21BTP303T ¹	MOOC	3	0	0	3		
21LEM302T ¹	Indian Traditional Knowledge	1	0	0	0		
21PDM302L ¹	Employability Skills and Practices	0	0	2	0		
Total Credits						19	
Semester – VII							
Course Code	Course Title	Hours / Week					
		L	T	P	C		
21BTC401L ¹	Plant Biotechnology Laboratory	0	0	4	2		
21BTC402J	Bio Separation Technology	3	0	2	4		
E	Professional Elective – IV				3		
E	Professional Elective – V				3		
O	Open Elective – III				3		
21GNH401T	Behavioral Psychology	2	1	0	3		
21BTM191T ¹	Bioethics and IPR	1	0	0	0		
Total Credits						18	
Semester – VIII							
Course Code	Course Title	Hours / Week					
		L	T	P	C		
21BTP401L	Major Project	0	0	30	15		
21BTP402L	Major Project	0	0	20	10		
21BTP403L	Internship#	0	0	10	5		
Total Credits						15	

#Students have to register either 21BTP401L or 21BTP402L and 21BTP403L both in eighth semester



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