

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)

SRM INSTITUTE OF SCIENCE AND TECHNOLOGY

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

Kattankulathur, Chengalpattu District 603203,

Tamil Nadu, India

12. B.Tech. in Biotechnology (Food Technology)

12. (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

12. (b) Program Educational Objectives (PEO)

PEO – 1	To acquire adequate knowledge and expertise in food technology for higher education, research and industry
PEO – 2	To find, characterize and understand strategies to solve technical problems in food industries
PEO – 3	To grow professionally as food technologist, who can contribute to food security, sustainability and be involved in life-long learning

12. (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

12. (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			
	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	PSO-1	PSO-2	PSO-3
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	Ability to implement the knowledge of the food product development, safety, upstream processing and product marketing of major subsystems and technologies associated with food for sustainable professional career
PSO - 2	Ability to comprehend and communicate effectively within a multidisciplinary working environment in the context of the emerging technologies.
PSO - 3	Ability to acquire technical, managerial and entrepreneurial skill that makes them an employable graduate and / food entrepreneur

12. (e) Program Structure: B.Tech. in Biotechnology (Food Technology)

Humanities & Social Sciences including Management Courses (H)						
Course Code	Course Title	Hours / Week				
		L	T	P	C	
21LEH101T	Communicative English	2	1	0	3	
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	
21GNH401T	Behavioural Psychology	2	1	0	3	
21PDH209T	Social Engineering	2	0	0	2	
Total Credits 13						
Engineering Science Courses (S)						
Course Code	Course Title	Hours / Week				
		L	T	P	C	
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	
21CSS101J	Programming for Problem Solving	3	0	2	4	
21CHS251T	Basic Chemical Engineering	3	0	0	3	
21CHS252J	Chemical Engineering Principles	3	0	2	4	
21CSS303T	Data Science	2	0	0	2	
Total Credits 24						
Non Credit Courses (M)						
Course Code	Course Title	Hours / Week				
		L	T	P	C	
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 Skills and Practices	0	0	2		
21CYM101T ¹	Environmental Science	1	0	0		0
21LEM101T ¹	Constitution of India	1	0	0		0
21LEM102T ¹	Universal Human Values – Introduction	1	0	0		0
21LEM201T ¹	Professional Ethics	1	0	0		0
21LEM202T ¹	Universal Human Values-II: Understanding Harmony and Ethical Human Conduct	2	1	0	3	
21LEM301T ¹	Indian Art Form	1	0	0	0	
21LEM302T ¹	Indian Traditional Knowledge	1	0	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					
21BTM191T ¹	Bioethics and IPR	1	0	0	0	
Total Credits 03						
Project Work, Seminar, Internship in Industry / Higher Technical Institutions (P)						
Course Code	Course Title	Hours / Week				
		L	T	P	C	
21GNP301L ¹	Community Connect	0	0	2	1	
21BTP302L ¹	Project	0	0	6	3	
21BTP303T ¹	MOOC	3	0	0		
21BTP401L	Major Project	0	0	30		15
21BTP402L	Major Project	0	0	20	10	

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	Bio-Statistics 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		
21CSC206T	Artificial Intelligence	2	1	0	3	
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	
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		
21BTO101T	Human Health and Diseases	3	0	0	3	
21BTO105T	Animal Models for Research	3	0	0	3	
21BTO106T	Waste to Wealth to Wheels	3	0	0	3	
21BTO107T	Fundamental Neurobiology	3	0	0	3	
21BTO101T	Human Health and Diseases	3	0	0	3	
21BTO105T	Animal Models for Research	3	0	0	3	
Total Credits 09						
Professional Elective Courses (E) (Any 5 Courses)						
Course Code	Course Title	Hours / Week			C	
		L	T	P		
21BTE209T	Food Chemistry	3	0	0	3	
21BTE210T	Food Processing Technology	3	0	0	3	
21BTE333T	Dairy Technology	3	0	0	3	
21BTE334T	Grain Processing	3	0	0	3	
21BTE335T	Meat, poultry and fish Technology	3	0	0	3	
21BTE336T	Post- Harvest Technology for Fruits and Vegetables	3	0	0	3	
21BTE429T	Bakery and Confectionary Technology	3	0	0	3	
21BTE430T	Beverage Technology	3	0	0	3	
21BTE431T	Food Biotechnology	3	0	0	3	

21BTP403L	Internship#	0	0	10	5	21BTE432T	Nutraceuticals and Functional Foods	3	0	0	3
Total Credits						Total Credits					
19						15					

12. (f) Programme Articulation: B.Tech. in Biotechnology (Food Technology)

Course Code	Course Name	Program Outcomes (PO)												PSO		
		1	2	3	4	5	6	7	8	9	10	11	12	1	2	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	PSO-1	PSO-2	PSO-3
21BTB105T	Cell Biology	2	3	3	3	2	-	-	-	-	-	-	-	-	2.67	3
21BTC101T	Biochemistry	3	2	-	3	-	-	-	-	-	-	-	-	3	2	-
21BTC201L	Biochemistry Laboratory	3	2	-	3	-	-	-	-	-	-	-	-	3	2	-
21BTC202T	Microbiology	2.5	2	2.25	2.67	3	-	2	2	-	-	-	-	1.83	-	2
21BTC203L	Cell and Molecular Biology Laboratory	2.5	2	2.25	2.67	3	-	2	2	-	-	-	-	1.83	-	2
21BTC204T	Bioprocess Principles	2.5	2.67	2.25	2	2	-	-	-	-	-	-	-	2.67	1.75	-
21BTC205L	Bioprocess Principles Laboratory	2.5	2.67	2.25	2	2	-	-	-	-	-	-	-	2.67	1.75	-
21BTC206T	Genetics and Cytogenetics	2.67	2.5	2.2	2	-	-	-	-	-	-	-	-	2.5	2.5	-
21BTC207T	Molecular Biology	3	2.75	2.4	-	-	-	-	-	-	-	-	-	2.67	2.83	-
21BTC208L	Molecular Biology Laboratory	3	2.75	2.4	-	-	-	-	-	-	-	-	-	2.67	2.83	-
21BTC209T	Bioprocess Engineering	-	3	1.75	2.25	2	-	-	-	-	-	-	-	2	2	1
21BTC210L	Bioprocess Engineering Laboratory	-	3	1.75	2.25	2	-	-	-	-	-	-	-	2	2	1
21BTC301J	Gene manipulation and Genomics	2.67	2.67	2.5	2.33	2.75	-	-	2	-	-	-	-	2.83	2.83	-
21BTC302J	Immunology	-	-	2	2.6	2.33	1	-	-	-	-	-	-	1.67	-	2
21BTC303T	Protein engineering	1.5	2	3	2	3	-	-	-	-	-	-	-	3	3	-
21BTC304T	Animal Biotechnology	3	3	3	3	-	-	-	-	-	-	-	-	3	3	-
21BTC305L	Animal biotechnology Laboratory	3	3	3	3	-	-	-	-	-	-	-	-	3	3	-
21BTC306T	Plant Biotechnology	3	2.6	3	3	3	-	-	-	-	-	-	-	2.5	2	2.75
21BTC401L	Plant Biotechnology Laboratory	3	2.6	3	3	3	-	-	-	-	-	-	-	2.5	2	2.75
21BTC402J	Bio separation Technology	3	2.33	2.5	1	-	-	-	-	-	-	-	-	2.5	2.67	-
21BTM191T	Bioethics and IPR	1.83	2.33	-	-	-	-	2.67	3	-	-	-	-	2.67	-	3
21BTE209T	Food Chemistry	2	-	2.67	2.75	2	-	-	-	-	-	-	-	1.75	3	1.66
21BTE210T	Food Processing Technology	2	-	2.67	2.75	2	-	-	-	-	-	-	-	1.75	3	1.66
21BTE333T	Dairy Technology	-	2	2.4	-	2	-	-	-	-	-	-	-	1.5	2.5	-
21BTE334T	Grain Processing	2.33	-	3	3	3	-	-	-	-	-	-	-	2	3	-
21BTE335T	Meat, poultry and fish Technology	3	2	2.5	2.5	3	-	-	-	-	-	-	-	3	2	-
21BTE336T	Post- Harvest Technology for Fruits and vegetables	2	2.67	-	2.33	3	-	-	-	-	-	-	-	2.67	2.67	-
21BTE429T	Bakery and Confectionary Technology	2.5	-	2	1.5	2	-	-	2.16	-	-	-	-	2.5	3	2
21BTE430T	Beverage Technology	2.33	2.33	3	3	2	-	-	-	-	-	-	-	3	2.75	2
21BTE431T	Food Biotechnology	2.5	2.5	1.33	1.33	-	-	-	-	-	-	-	-	1	1.5	2
21BTE432T	Nutraceuticals and Functional Foods	2.33	2.33	3	3	2	-	-	-	-	-	-	-	3	2.75	2
21GNP301L	Community Connect	3	2	2	-	-	-	-	-	-	2	-	2	2	2	-
21BTP302L	MOOC	3	2	2	-	-	-	-	-	-	2	-	2	2	2	-
21BTP303L	Project	3	3	3	3	3	2	3	3	3	3	3	3	3	3	3
21BTP401L	Major Project	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3
21BTP402L	Major Project	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3
21BTP403L	Internship	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3
Program Average		2.66	2.48	2.53	2.56	2.66	2.66	2.66	2.79	3	2.6	3	2.6	2.47	2.63	2.37

12. (g) Implementation Plan: B.Tech. in Biotechnology (Food Technology)

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	2	1	0	3	
21LEH103T	French					
21LEH104T	German					
21LEH105T	Japanese					
21LEH106T	Korean					
21LEH107T	Spanish					
21LEH108T	Russian	1	0	2	2	
21GNH101J	Philosophy of Engineering					
21MAB102T	Advanced Calculus and Complex Analysis	3	1	0	4	
21CYB101J	Chemistry	3	1	2	5	
21BTC101T	Biochemistry	3	0	0	3	
21CSS101J	Programming for Problem Solving	3	0	2	4	
21BTB105T	Cell Biology	2	0	0	2	
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	0	0	2	0	
21GNM102L ¹	National Service Scheme					
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	
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	
21PDH209T ¹	Social Engineering	2	0	0	2	
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	2	1	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	
	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	Bio-Statistics 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	
	Professional Elective - II				3	
	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	2	0	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	
	Professional Elective-III				3	
	Open Elective-II				3	
21BTP302L ¹	Project	0	0	6	3	
21BTP303T ¹	MOOC	3	0	0		
21PDM302L ¹	Employability Skills and Practices	0	0	2	0	
21LEM302T ¹	Indian Traditional Knowledge	1	0	0	0	
Total Credits					19	

Semester - VII						
Course Code	Course Title	Hours / Week				
		L	T	P	C	
21GNH401T	Behavioral Psychology	2	1	0	3	
	Professional Elective-IV				3	
	Professional Elective-V				3	
21BTC401L ¹	Plant Biotechnology Laboratory	0	0	4	2	
21BTC402J	Bio Separation Technology	3	0	2	4	
	Open Elective-III				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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