## **ACADEMIC CURRICULA**

## UNDERGRADUATE DEGREE PROGRAMMES

**Bachelor of Technology** 

(B.Tech. - Four Years)

(Choice Based Flexible Credit System)

Regulations 2018

Volume - 1

(Revised in March 2019)



# SRM INSTITUTE OF SCIENCE AND TECHNOLOGY

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

Kattankulathur, Kancheepuram District 603203, Tamil Nadu, India



## 6. B.Tech. in Biotechnology with Specialization in Genetic Engineering

#### 6. (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 - 7	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

#### 6. (b) Program Educational Objectives (PEO)

PEO - 1	To identify and solve clinical, industrial and agricultural problems through genetic engineering
PEO - 2	To gain knowledge in cloning strategies for bacteria, yeast, plants and animals.
PEO - 3	To know the economic, environmental, and social implications of genetic engineering research.

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

	Mission Stmt 1	Mission Stmt 2	Mission Stmt 3
PEO - 1	H	Н	Н
PEO - 2	M	H	Н
PEO - 3	Н	Н	Н

H – High Correlation, M – Medium Correlation, L – Low Correlation

#### 6. (d) Mapping Program Educational Objectives (PEO) to Program Learning Outcomes (PLO)

	-			The second	-, 75	Progra	m Lear	ning Ou	tcomes	(PLO)					
					Gr	aduate At	tributes (0	GA)					Proj Out	gram S <mark>pe</mark> comes (F	ecific (SO)
	Engineering Knowledge	Problem Analysis	Design & Development	Analysis, Design, Research	Modem Tool Usage	Society & Culture	Environment & Sustainability	Ethics	Individual & Team Work	Communication	Project Mgt. & Finance	Life Long Learning	PSO - 1	PSO - 2	PSO - 3
PEO - 1	Н	M	M	Ĥ	Н	Ĥ	Н	Н	Н	Ĥ	M	Н	Н	Н	H
PEO - 2	Н	Н	Н	Н	Н	М	М	Н	Н	Н	М	Н	Н	Н	Н
PEO - 3	М	Н	Н	H -	Н	Н	Н	Н	Н	Н	М	Н	Н	Н	Н

H - High Correlation, M - Medium Correlation, L - Low Correlation

#### PSO – Program Specific Outcomes (PSO)

PSO - 1	Ability to solve scientific problems through genetic approaches.
PSO - 2	Ability to implement the knowledge gained in the applied fields of genetic engineering.
PSO - 3	Ability to understand social and ethical responsibilities of genetic research.

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

	Humanities & Social Sciences						Basic Science Courses (B)				
	including Management Courses (H)					Course	Course	Hou	rs/ W	/eek	
Course	Course	Hou	ırs/ V	Veek		Code	Title	L	Т	Р	С
Code	Title	L	Τ	Р	С	18PYB101J	Physics: Electromagnetic Theory, Quantum	3	1	2	5
18LEH101J		2	0	2	3		Mechanics, Waves and Optics				
18LEH102J						18CYB101J		3	1	2	5
18LEH103J		_			•		Calculus and Linear Algebra	3	1	0	4
18LEH104J		2	0	2	3		Advanced Calculus and Complex Analysis	3	1	0	4
18LEH105J		4					Bio-Statistics for Biotechnologists	3	1	0	4
18LEH106J		0	0	2	-	18B1B1031	Human Physiology and Health	3	0	0	3
	General Aptitude  Management Principles for Engineers	2	0	0	2		Total Learning Credits				25
	Social Engineering	2	0	0	2		Professional Core Courses (C)				
	Employability Skills & Practices	0	0	2	1	Course	Professional Core Courses (C) Course	Цол	rs/ W	look	
TOT DITZOTT	Total Learning Credits	_	U		12	Course	Title	ΠOU	T	P	С
	Total Loanning Ground				-		Biochemistry	3	0	2	4
	Engineering Science Courses (S)						Cell Biology	3	0	2	4
Course	Course	Ног	ırs/ V	Veek			Microbiology	3	0	2	4
Code	Title	I	T	P	С		Genetics and Cytogenetics	3	0	0	3
	Engineering Graphics and Design	1	0	4	3	18BTC105.1	Molecular Biology	3	0	2	4
18MES102.I	Basic Civil and Mechanical Engineering	3	1	2	5		Immunology	3	0	2	4
	Electrical and Electronics Eng. Workshop	1	0	4	3		Bioprocess Principles	3	0	2	4
	Programming for Problem Solving	3	0	4	5		Plant Biotechnology	3	0	2	4
18CHS251T	Basic Chemical Engineering	3	0	0	3		Gene manipulation and Genomics	3	0	2	4
18CHS252T	Chemical Engineering Principles	3	0	0	3		Bioprocess Engineering	3	0	2	4
18CHS253L	Chemical Engineering Practice	0	0	4	2		Animal Biotechnology	3	0	2	4
	Total Learning Credits	;			24		Protein engineering and proteomics	3	0	0	3
	~~ /				-	18BTC301J	Bioseparation Technology	3	0	2	4
	5. Professional Elective Courses (E)					18BTC350T	Comprehension	0	1	0	1
	(Any 6 Courses)						Total Learning Credits	;			51
Course	Course	Hou	ırs/ V	Veek							
Code	Title	L	Τ	Р	С		Open Elective Courses (O)				
18BTE420T	Human Genetics	3	0	0	3		(Any 5 Courses)				
18BTE421T	High Throughput Technologies in advanced	3	0	0	3	Course	Course	_	rs/ V		
	biology					Code	Title	L	Τ		С
18BTF422T	Matabalia Enginearing of microbas		0	0	3				^	0	3
	Metabolic Engineering of microbes	3					Human Health and diseases	3	0		
18BTE423T	Genetics of Crop Improvement	3	0	0	3	18BTO102T	Modelling of biomolecules	3	0		3
18BTE423T 18BTE424T	Genetics of Crop Improvement Molecular biology of Infectious diseases	3	0	0	3	18BTO102T 18BTO103T	Modelling of biomolecules Activated carbon technology	3	0	0	3
18BTE423T 18BTE424T 18BTE425T	Genetics of Crop Improvement  Molecular biology of Infectious diseases  Molecular Diagnostics	3 3	0 0	0 0 0	3	18BTO102T 18BTO103T 18BTO104T	Modelling of biomolecules Activated carbon technology Defense Forces in our body	3 3	0 0 0	0	3
18BTE423T 18BTE424T 18BTE425T 18BTE426T	Genetics of Crop Improvement Molecular biology of Infectious diseases Molecular Diagnostics Gene therapy	3 3 3 3	0 0 0	0 0 0 0	3 3	18BTO102T 18BTO103T 18BTO104T 18BTO105T	Modelling of biomolecules Activated carbon technology Defense Forces in our body Animal Models For Research	3 3 3	0 0 0	0 0 0	3 3 3
18BTE423T 18BTE424T 18BTE425T 18BTE426T 18BTE427T	Genetics of Crop Improvement Molecular biology of Infectious diseases Molecular Diagnostics Gene therapy Functional genomics	3 3 3 3 3	0 0 0 0	0 0 0 0	3 3 3	18BTO102T 18BTO103T 18BTO104T 18BTO105T 18BTO106T	Modelling of biomolecules Activated carbon technology Defense Forces in our body Animal Models For Research Waste to Wealth to Wheels	3 3 3 3 3	0 0 0 0	0 0 0 0	3 3 3
18BTE423T 18BTE424T 18BTE425T 18BTE426T 18BTE427T	Genetics of Crop Improvement Molecular biology of Infectious diseases Molecular Diagnostics Gene therapy Functional genomics Plant Interactions	3 3 3 3 3	0 0 0	0 0 0 0	3 3 3 3	18BTO102T 18BTO103T 18BTO104T 18BTO105T 18BTO106T	Modelling of biomolecules Activated carbon technology Defense Forces in our body Animal Models For Research Waste to Wealth to Wheels Fundamental Neurobiology	3 3 3 3 3 3	0 0 0	0 0 0	3 3 3 3 3
18BTE423T 18BTE424T 18BTE425T 18BTE426T 18BTE427T	Genetics of Crop Improvement Molecular biology of Infectious diseases Molecular Diagnostics Gene therapy Functional genomics	3 3 3 3 3	0 0 0 0	0 0 0 0	3 3 3	18BTO102T 18BTO103T 18BTO104T 18BTO105T 18BTO106T	Modelling of biomolecules Activated carbon technology Defense Forces in our body Animal Models For Research Waste to Wealth to Wheels	3 3 3 3 3 3	0 0 0 0	0 0 0 0	3 3 3
18BTE423T 18BTE424T 18BTE425T 18BTE426T 18BTE427T	Genetics of Crop Improvement Molecular biology of Infectious diseases Molecular Diagnostics Gene therapy Functional genomics Plant Interactions Total Learning Credits	3 3 3 3 3	0 0 0 0	0 0 0 0	3 3 3 3	18BTO102T 18BTO103T 18BTO104T 18BTO105T 18BTO106T	Modelling of biomolecules Activated carbon technology Defense Forces in our body Animal Models For Research Waste to Wealth to Wheels Fundamental Neurobiology Total Learning Credits	3 3 3 3 3 3	0 0 0 0	0 0 0 0	3 3 3 3 3
18BTE423T 18BTE424T 18BTE425T 18BTE426T 18BTE427T	Genetics of Crop Improvement Molecular biology of Infectious diseases Molecular Diagnostics Gene therapy Functional genomics Plant Interactions Total Learning Credits 7. Project Work, Seminar, Internship In	3 3 3 3 3	0 0 0 0	0 0 0 0	3 3 3 3	18BTO102T 18BTO103T 18BTO104T 18BTO105T 18BTO106T 18BTO107T	Modelling of biomolecules Activated carbon technology Defense Forces in our body Animal Models For Research Waste to Wealth to Wheels Fundamental Neurobiology Total Learning Credits  Mandatory Courses (M)	3 3 3 3 3 3	0 0 0 0 0	0 0 0 0	3 3 3 3 3 15
18BTE423T 18BTE424T 18BTE425T 18BTE426T 18BTE427T 18BTE428T	Genetics of Crop Improvement Molecular biology of Infectious diseases Molecular Diagnostics Gene therapy Functional genomics Plant Interactions Total Learning Credits 7. Project Work, Seminar, Internship In Industry/ Higher Technical Institutions (P)	3 3 3 3 3	0 0 0 0 0	0 0 0 0 0 0 0	3 3 3 3 18	18BTO102T 18BTO103T 18BTO104T 18BTO105T 18BTO106T 18BTO107T	Modelling of biomolecules Activated carbon technology Defense Forces in our body Animal Models For Research Waste to Wealth to Wheels Fundamental Neurobiology Total Learning Credits  Mandatory Courses (M) Course Title	3 3 3 3 3 3	0 0 0 0 0	0 0 0 0	3 3 3 3 15
18BTE423T 18BTE424T 18BTE425T 18BTE426T 18BTE427T 18BTE428T	Genetics of Crop Improvement Molecular biology of Infectious diseases Molecular Diagnostics Gene therapy Functional genomics Plant Interactions  Total Learning Credits  7. Project Work, Seminar, Internship In Industry/ Higher Technical Institutions (P) Course Title	3 3 3 3 3	0 0 0 0	0 0 0 0 0 0 0	3 3 3 3	18BTO102T 18BTO103T 18BTO104T 18BTO105T 18BTO106T 18BTO107T Code	Modelling of biomolecules Activated carbon technology Defense Forces in our body Animal Models For Research Waste to Wealth to Wheels Fundamental Neurobiology Total Learning Credits  Mandatory Courses (M) Course Title Professional Skills and Practices	3 3 3 3 3 3	0 0 0 0 0	0 0 0 0	3 3 3 3 3 15
18BTE423T 18BTE424T 18BTE425T 18BTE426T 18BTE427T 18BTE428T Code 18BTP101L	Genetics of Crop Improvement Molecular biology of Infectious diseases Molecular Diagnostics Gene therapy Functional genomics Plant Interactions  Total Learning Credits  7. Project Work, Seminar, Internship In Industry/ Higher Technical Institutions (P) Course Title Massive Open Online Course - I	3 3 3 3 3 3 5	0 0 0 0 0	0 0 0 0 0	3 3 3 3 18	18BTO102T 18BTO103T 18BTO104T 18BTO105T 18BTO107T 18BTO107T Code 18PDM101L 18PDM201L	Modelling of biomolecules Activated carbon technology Defense Forces in our body Animal Models For Research Waste to Wealth to Wheels Fundamental Neurobiology Total Learning Credits  Mandatory Courses (M) Course Title Professional Skills and Practices Competencies in Social Skills	3 3 3 3 3 3	0 0 0 0 0	0 0 0 0	3 3 3 3 15
18BTE423T 18BTE424T 18BTE425T 18BTE426T 18BTE426T 18BTE428T Code 18BTP101L 18BTP102L	Genetics of Crop Improvement Molecular biology of Infectious diseases Molecular Diagnostics Gene therapy Functional genomics Plant Interactions  Total Learning Credits  7. Project Work, Seminar, Internship In Industryl Higher Technical Institutions (P) Course Title Massive Open Online Course - I Industrial Training-I	3 3 3 3 3	0 0 0 0 0	0 0 0 0 0 0	3 3 3 3 18	18BTO102T 18BTO103T 18BTO104T 18BTO105T 18BTO106T 18BTO107T 18BTO107T 18BTO107T 18PDM101L 18PDM201L 18PDM203L	Modelling of biomolecules Activated carbon technology Defense Forces in our body Animal Models For Research Waste to Wealth to Wheels Fundamental Neurobiology Total Learning Credits  Mandatory Courses (M)  Course Title Professional Skills and Practices Competencies in Social Skills Entrepreneurial Skill Development	3 3 3 3 3 3 3 4 0	0 0 0 0 0 0	0 0 0 0 0	3 3 3 3 15
18BTE423T 18BTE424T 18BTE425T 18BTE426T 18BTE426T 18BTE428T Code 18BTP101L 18BTP102L 18BTP103L	Genetics of Crop Improvement Molecular biology of Infectious diseases Molecular Diagnostics Gene therapy Functional genomics Plant Interactions  Total Learning Credits  7. Project Work, Seminar, Internship In Industryl Higher Technical Institutions (P) Course Title Massive Open Online Course - I Industrial Training-I Seminar - I	3 3 3 3 3 3 5	0 0 0 0 0	0 0 0 0 0	3 3 3 3 18	18BTO102T 18BTO103T 18BTO104T 18BTO105T 18BTO107T 18BTO107T Code 18PDM101L 18PDM201L 18PDM203L 18PDM203L	Modelling of biomolecules Activated carbon technology Defense Forces in our body Animal Models For Research Waste to Wealth to Wheels Fundamental Neurobiology Total Learning Credits  Mandatory Courses (M) Course Title Professional Skills and Practices Competencies in Social Skills Entrepreneurial Skill Development Critical and Creative Thinking Skills	3 3 3 3 3 3 4 1 1 1 1	0 0 0 0 0 0	0 0 0 0 0	3 3 3 3 15
18BTE423T 18BTE424T 18BTE425T 18BTE426T 18BTE427T 18BTE428T Code 18BTP101L 18BTP102L 18BTP103L 18BTP104L	Genetics of Crop Improvement Molecular biology of Infectious diseases Molecular Diagnostics Gene therapy Functional genomics Plant Interactions  Total Learning Credits  7. Project Work, Seminar, Internship In Industry/ Higher Technical Institutions (P) Course Title Massive Open Online Course - I Industrial Training-I Seminar - I Massive Open Online Course - II	3 3 3 3 3 3 3 4 4 1 0	0 0 0 0 0 0	0 0 0 0 0 0	3 3 3 3 18	18BTO102T 18BTO103T 18BTO104T 18BTO105T 18BTO106T 18BTO107T Code 18PDM101L 18PDM201L 18PDM203L 18PDM203L 18PDM202L	Modelling of biomolecules Activated carbon technology Defense Forces in our body Animal Models For Research Waste to Wealth to Wheels Fundamental Neurobiology Total Learning Credits  Mandatory Courses (M) Course Title Professional Skills and Practices Competencies in Social Skills Entrepreneurial Skill Development Critical and Creative Thinking Skills Business Basics for Entrepreneurs	3 3 3 3 3 3 3 4 0	0 0 0 0 0 0 0	0 0 0 0 0 0	3 3 3 3 15
18BTE423T 18BTE424T 18BTE425T 18BTE426T 18BTE427T 18BTE428T Code 18BTP101L 18BTP103L 18BTP103L 18BTP104L	Genetics of Crop Improvement Molecular biology of Infectious diseases Molecular Diagnostics Gene therapy Functional genomics Plant Interactions  Total Learning Credits  7. Project Work, Seminar, Internship In Industry/ Higher Technical Institutions (P) Course Title Massive Open Online Course - I Industrial Training-I Seminar - I Massive Open Online Course - II Industrial Training-II	3 3 3 3 3 3 5	0 0 0 0 0	0 0 0 0 0 0	3 3 3 3 18	18BTO102T 18BTO103T 18BTO104T 18BTO105T 18BTO106T 18BTO107T Code 18PDM101L 18PDM201L 18PDM203L 18PDM203L 18PDM204L 18PDM204L	Modelling of biomolecules Activated carbon technology Defense Forces in our body Animal Models For Research Waste to Wealth to Wheels Fundamental Neurobiology Total Learning Credits  Mandatory Courses (M) Course Title Professional Skills and Practices Competencies in Social Skills Entrepreneurial Skill Development Critical and Creative Thinking Skills Business Basics for Entrepreneurs Analytical and Logical Thinking Skills	3 3 3 3 3 3 3 4 0	0 0 0 0 0 0 0	0 0 0 0 0 0	3 3 3 3 15
18BTE423T 18BTE424T 18BTE426T 18BTE426T 18BTE426T 18BTE428T 18BTE428T 18BTP101L 18BTP103L 18BTP103L 18BTP105L 18BTP105L	Genetics of Crop Improvement Molecular biology of Infectious diseases Molecular Diagnostics Gene therapy Functional genomics Plant Interactions  Total Learning Credits  7. Project Work, Seminar, Internship In Industryl Higher Technical Institutions (P) Course Title Massive Open Online Course - I Industrial Training-I Seminar - I Industrial Training-II Seminar - III	3 3 3 3 3 3 3 4 4 1 0	0 0 0 0 0 0	0 0 0 0 0 0	3 3 3 3 18	18BTO102T 18BTO103T 18BTO104T 18BTO106T 18BTO107T 18BTO107T 18BTO107T 18PDM201L 18PDM203L 18PDM202L 18PDM204L 18PDM201L 18PDM301L 18PDM301L	Modelling of biomolecules Activated carbon technology Defense Forces in our body Animal Models For Research Waste to Wealth to Wheels Fundamental Neurobiology Total Learning Credits  Mandatory Courses (M)  Course Title Professional Skills and Practices Competencies in Social Skills Entrepreneurial Skill Development Critical and Creative Thinking Skills Business Basics for Entrepreneurs Analytical and Logical Thinking Skills Entrepreneurship Management	3 3 3 3 3 3 3 4 0 0	0 0 0 0 0 0 0	0 0 0 0 0 0	3 3 3 3 15 C 0 0
18BTE423T 18BTE424T 18BTE426T 18BTE426T 18BTE426T 18BTE428T 18BTE428T 18BTP101L 18BTP102L 18BTP103L 18BTP104L 18BTP105L 18BTP105L 18BTP106L 18BTP106L	Genetics of Crop Improvement Molecular biology of Infectious diseases Molecular Diagnostics Gene therapy Functional genomics Plant Interactions  Total Learning Credits  7. Project Work, Seminar, Internship In Industryl Higher Technical Institutions (P) Course Title Massive Open Online Course - I Industrial Training-I Seminar - I Massive Open Online Course - II Industrial Training-II Seminar - II Mindustrial Training-II Seminar - II Mindustrial Training-II Seminar - II Minor Project	3 3 3 3 3 3 3 4 4 1 0	0 0 0 0 0 0	0 0 0 0 0 0 0 0	3 3 3 3 18	18BTO102T 18BTO103T 18BTO104T 18BTO105T 18BTO106T 18BTO107T 18BTO107T 18PDM201L 18PDM203L 18PDM204L 18PDM204L 18PDM302L 18PDM302L 18PDM302L	Modelling of biomolecules Activated carbon technology Defense Forces in our body Animal Models For Research Waste to Wealth to Wheels Fundamental Neurobiology Total Learning Credits  Mandatory Courses (M)  Course Title Professional Skills and Practices Competencies in Social Skills Entrepreneurial Skill Development Critical and Creative Thinking Skills Business Basics for Entrepreneurs Analytical and Logical Thinking Skills Entrepreneurship Management Constitution of India	3 3 3 3 3 3 3 3 4 0 - 0	0 0 0 0 0 0 0 0	0 0 0 0 0 0	3 3 3 3 3 15 C 0 0
18BTE423T 18BTE424T 18BTE426T 18BTE426T 18BTE427T 18BTE428T 18BTE428T 18BTP101L 18BTP102L 18BTP103L 18BTP105L 18BTP105L 18BTP105L 18BTP107L 18BTP107L	Genetics of Crop Improvement Molecular biology of Infectious diseases Molecular Diagnostics Gene therapy Functional genomics Plant Interactions  Total Learning Credits  7. Project Work, Seminar, Internship In Industryl Higher Technical Institutions (P) Course Title Massive Open Online Course - I Industrial Training-I Seminar - I Massive Open Online Course - III Industrial Training-II Seminar - III Minor Project Internship (4-6 weeks)	3 3 3 3 3 3 3 5	0 0 0 0 0 0	0 0 0 0 0 0 0 0	3 3 3 3 3 18	18BTO102T 18BTO103T 18BTO104T 18BTO105T 18BTO106T 18BTO107T Code 18PDM101L 18PDM203L 18PDM203L 18PDM204L 18PDM301L 18PDM301L 18PDM301L 18PDM301L 18LEM101T 18LEM101T	Modelling of biomolecules Activated carbon technology Defense Forces in our body Animal Models For Research Waste to Wealth to Wheels Fundamental Neurobiology Total Learning Credits  Mandatory Courses (M) Course Title Professional Skills and Practices Competencies in Social Skills Entrepreneurial Skill Development Critical and Creative Thinking Skills Business Basics for Entrepreneurs Analytical and Logical Thinking Skills Entrepreneurship Management Constitution of India Value Education	3 3 3 3 3 3 3 3 0 - 0	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 2 2 2 2 0 1	3 3 3 3 3 15 C 0 0 0
18BTE423T 18BTE424T 18BTE426T 18BTE426T 18BTE427T 18BTE428T 18BTP101L 18BTP103L 18BTP104L 18BTP105L 18BTP105L 18BTP105L 18BTP107L 18BTP108L 18BTP108L	Genetics of Crop Improvement Molecular biology of Infectious diseases Molecular Diagnostics Gene therapy Functional genomics Plant Interactions  Total Learning Credits  7. Project Work, Seminar, Internship In Industry/ Higher Technical Institutions (P) Course Title Massive Open Online Course - I Industrial Training-I Seminar - I Massive Open Online Course - III Industrial Training-II Seminar - II Minor Project Internship (4-6 weeks) Project	3 3 3 3 3 3 3 5	0 0 0 0 0 0	0 0 0 0 0 0 0 0 0 0 2 2 2	3 3 3 3 3 18	18BTO102T 18BTO103T 18BTO104T 18BTO104T 18BTO105T 18BTO107T  Code 18PDM101L 18PDM203L 18PDM203L 18PDM204L 18PDM301L	Modelling of biomolecules Activated carbon technology Defense Forces in our body Animal Models For Research Waste to Wealth to Wheels Fundamental Neurobiology Total Learning Credits  Mandatory Courses (M) Course Title Professional Skills and Practices Competencies in Social Skills Entrepreneurial Skill Development Critical and Creative Thinking Skills Business Basics for Entrepreneurs Analytical and Logical Thinking Skills Entrepreneurship Management Constitution of India Value Education Physical and Mental Health using Yoga	3 3 3 3 3 3 3 3 4 0 - 0	0 0 0 0 0 0 0 0	0 0 0 0 0 0	3 3 3 3 3 15 C 0 0
18BTE423T 18BTE424T 18BTE426T 18BTE426T 18BTE427T 18BTE428T 18BTP101L 18BTP103L 18BTP104L 18BTP105L 18BTP105L 18BTP105L 18BTP107L 18BTP108L 18BTP108L	Genetics of Crop Improvement Molecular biology of Infectious diseases Molecular Diagnostics Gene therapy Functional genomics Plant Interactions  Total Learning Credits  7. Project Work, Seminar, Internship In Industry/ Higher Technical Institutions (P) Course Title Massive Open Online Course - I Industrial Training-I Seminar - I Massive Open Online Course - II Industrial Training-II Seminar - II Minor Project Internship (4-6 weeks) Project Semester Internship	3 3 3 3 3 3 3 3 5	0 0 0 0 0 0 0	0 0 0 0 0 0 0 0 0 0 2 2 2	3 3 3 3 3 18 18 1 1 1 1	18BTO102T 18BTO103T 18BTO104T 18BTO105T 18BTO106T 18BTO107T  Code 18PDM101L 18PDM201L 18PDM203L 18PDM203L 18PDM301L	Modelling of biomolecules Activated carbon technology Defense Forces in our body Animal Models For Research Waste to Wealth to Wheels Fundamental Neurobiology  Total Learning Credits  Mandatory Courses (M)  Course Title Professional Skills and Practices Competencies in Social Skills Entrepreneurial Skill Development Critical and Creative Thinking Skills Business Basics for Entrepreneurs Analytical and Logical Thinking Skills Entrepreneurship Management Constitution of India Value Education Physical and Mental Health using Yoga NSS	3 3 3 3 3 3 3 3 4 0 0 0 1 1 0	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	P 2 2 2 0 1 1 2	3 3 3 3 3 15 C 0 0 0
18BTE423T 18BTE424T 18BTE426T 18BTE426T 18BTE427T 18BTE428T 18BTP101L 18BTP103L 18BTP104L 18BTP105L 18BTP105L 18BTP105L 18BTP105L 18BTP105L 18BTP105L 18BTP105L 18BTP105L	Genetics of Crop Improvement Molecular biology of Infectious diseases Molecular Diagnostics Gene therapy Functional genomics Plant Interactions  Total Learning Credits  7. Project Work, Seminar, Internship In Industry/ Higher Technical Institutions (P) Course Title Massive Open Online Course - I Industrial Training-I Seminar - I Massive Open Online Course - III Industrial Training-II Seminar - II Minor Project Internship (4-6 weeks) Project	3 3 3 3 3 3 3 3 5	0 0 0 0 0 0 0	0 0 0 0 0 0 0 0 0 0 2 2 2	3 3 3 3 3 18	18BTO102T 18BTO103T 18BTO104T 18BTO106T 18BTO107T 18BTO107T 18BTO107T 18PDM201L 18PDM203L 18PDM203L 18PDM204L 18PDM301L 18PDM301L 18PDM301L 18PM301L 18PM301L 18GMM101L 18GMM102L 18GMM103L	Modelling of biomolecules Activated carbon technology Defense Forces in our body Animal Models For Research Waste to Wealth to Wheels Fundamental Neurobiology Total Learning Credits  Mandatory Courses (M) Course Title Professional Skills and Practices Competencies in Social Skills Entrepreneurial Skill Development Critical and Creative Thinking Skills Business Basics for Entrepreneurs Analytical and Logical Thinking Skills Entrepreneurship Management Constitution of India Value Education Physical and Mental Health using Yoga NSS NCC	3 3 3 3 3 3 3 3 0 - 0	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 2 2 2 2 0 1	3 3 3 3 3 15 C 0 0 0
18BTE423T 18BTE424T 18BTE426T 18BTE426T 18BTE427T 18BTE428T 18BTP101L 18BTP103L 18BTP104L 18BTP105L 18BTP105L 18BTP105L 18BTP107L 18BTP108L 18BTP108L	Genetics of Crop Improvement Molecular biology of Infectious diseases Molecular Diagnostics Gene therapy Functional genomics Plant Interactions  Total Learning Credits  7. Project Work, Seminar, Internship In Industry/ Higher Technical Institutions (P) Course Title Massive Open Online Course - I Industrial Training-I Seminar - I Massive Open Online Course - II Industrial Training-II Seminar - II Minor Project Internship (4-6 weeks) Project Semester Internship	3 3 3 3 3 3 3 3 5	0 0 0 0 0 0 0	0 0 0 0 0 0 0 0 0 0 2 2 2	3 3 3 3 3 18 18 1 1 1 1	18BTO102T 18BTO103T 18BTO104T 18BTO105T 18BTO106T 18BTO107T 18BTO107T 18PDM201L 18PDM203L 18PDM203L 18PDM203L 18PDM303L 18PDM301L 18PDM301L 18PDM301L 18GNM101L 18GNM101L 18GNM103L	Modelling of biomolecules Activated carbon technology Defense Forces in our body Animal Models For Research Waste to Wealth to Wheels Fundamental Neurobiology Total Learning Credits  Mandatory Courses (M)  Course Title Professional Skills and Practices Competencies in Social Skills Entrepreneurial Skill Development Critical and Creative Thinking Skills Business Basics for Entrepreneurs Analytical and Logical Thinking Skills Entrepreneurship Management Constitution of India Value Education Physical and Mental Health using Yoga NSS NCC NSO	3 3 3 3 3 3 3 4 0 0 0	0 0 0 0 0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 2 2 2 2 2 2 2	3 3 3 3 3 15 C 0 0 0 0 0 0
18BTE423T 18BTE424T 18BTE426T 18BTE426T 18BTE427T 18BTE428T 18BTP101L 18BTP103L 18BTP104L 18BTP105L 18BTP105L 18BTP105L 18BTP107L 18BTP108L 18BTP108L	Genetics of Crop Improvement Molecular biology of Infectious diseases Molecular Diagnostics Gene therapy Functional genomics Plant Interactions  Total Learning Credits  7. Project Work, Seminar, Internship In Industry/ Higher Technical Institutions (P) Course Title Massive Open Online Course - I Industrial Training-I Seminar - I Massive Open Online Course - II Industrial Training-II Seminar - II Minor Project Internship (4-6 weeks) Project Semester Internship	3 3 3 3 3 3 3 3 5	0 0 0 0 0 0 0	0 0 0 0 0 0 0 0 0 0 2 2 2	3 3 3 3 3 18 18 1 1 1 1	18BTO102T 18BTO103T 18BTO104T 18BTO106T 18BTO106T 18BTO107T  Code 18PDM101L 18PDM201L 18PDM203L 18PDM204L 18PDM301L 18PDM301L 18BCM101T 18LEM102J 18GNM101L 18GNM101L 18GNM104L 18GNM104L 18LEM109T	Modelling of biomolecules Activated carbon technology Defense Forces in our body Animal Models For Research Waste to Wealth to Wheels Fundamental Neurobiology Total Learning Credits  Mandatory Courses (M) Course Title Professional Skills and Practices Competencies in Social Skills Entrepreneurial Skill Development Critical and Creative Thinking Skills Business Basics for Entrepreneurs Analytical and Logical Thinking Skills Entrepreneurship Management Constitution of India Value Education Physical and Mental Health using Yoga NSS NCC	3 3 3 3 3 3 3 3 4 0 0 0 1 1 0	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	P 2 2 2 0 1 1 2	3 3 3 3 3 15 C 0 0 0
18BTE423T 18BTE424T 18BTE426T 18BTE426T 18BTE427T 18BTE428T 18BTP101L 18BTP103L 18BTP104L 18BTP105L 18BTP105L 18BTP105L 18BTP107L 18BTP108L 18BTP108L	Genetics of Crop Improvement Molecular biology of Infectious diseases Molecular Diagnostics Gene therapy Functional genomics Plant Interactions  Total Learning Credits  7. Project Work, Seminar, Internship In Industry/ Higher Technical Institutions (P) Course Title Massive Open Online Course - I Industrial Training-I Seminar - I Massive Open Online Course - II Industrial Training-II Seminar - II Minor Project Internship (4-6 weeks) Project Semester Internship	3 3 3 3 3 3 3 3 5	0 0 0 0 0 0 0	0 0 0 0 0 0 0 0 0 0 2 2 2	3 3 3 3 3 18 18 1 1 1 1	18BTO102T 18BTO103T 18BTO104T 18BTO104T 18BTO105T 18BTO106T 18BTO107T  Code 18PDM101L 18PDM201L 18PDM201L 18PDM301L 18PDM301L 18PDM301L 18LEM101T 18LEM102J 18GNM101L 18GNM103L 18GNM103L 18GNM103L 18GNM103L 18LEM109T 18LEM109T	Modelling of biomolecules Activated carbon technology Defense Forces in our body Animal Models For Research Waste to Wealth to Wheels Fundamental Neurobiology Total Learning Credits  Mandatory Courses (M) Course Title Professional Skills and Practices Competencies in Social Skills Entrepreneurial Skill Development Critical and Creative Thinking Skills Business Basics for Entrepreneurs Analytical and Logical Thinking Skills Entrepreneurship Management Constitution of India Value Education Physical and Mental Health using Yoga NSS NSC NCC NSO Indian Traditional Knowledge	L 0 0 0 1 1	0 0 0 0 0 0 0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 2 2 2 2 2 2 0 1 2	3 3 3 3 3 15 C C 0 0 0 0
18BTE423T 18BTE424T 18BTE426T 18BTE426T 18BTE427T 18BTE428T 18BTP101L 18BTP103L 18BTP104L 18BTP105L 18BTP105L 18BTP105L 18BTP105L 18BTP105L 18BTP105L 18BTP105L 18BTP105L	Genetics of Crop Improvement Molecular biology of Infectious diseases Molecular Diagnostics Gene therapy Functional genomics Plant Interactions  Total Learning Credits  7. Project Work, Seminar, Internship In Industry/ Higher Technical Institutions (P) Course Title Massive Open Online Course - I Industrial Training-I Seminar - I Massive Open Online Course - II Industrial Training-II Seminar - II Minor Project Internship (4-6 weeks) Project Semester Internship	3 3 3 3 3 3 3 3 5	0 0 0 0 0 0 0	0 0 0 0 0 0 0 0 0 0 2 2 2	3 3 3 3 3 18 18 1 1 1 1	18BTO102T 18BTO103T 18BTO104T 18BTO104T 18BTO105T 18BTO107T  Code 18PDM101L 18PDM203L 18PDM203L 18PDM301L 18PDM301L 18PDM301L 18PDM301L 18LEM101T 18LEM101T 18LEM102J 18GNM103L 18GNM103L 18GNM103L 18GNM103L 18GNM103L 18GNM103L	Modelling of biomolecules Activated carbon technology Defense Forces in our body Animal Models For Research Waste to Wealth to Wheels Fundamental Neurobiology Total Learning Credits  Mandatory Courses (M) Course Title Professional Skills and Practices Competencies in Social Skills Entrepreneurial Skill Development Critical and Creative Thinking Skills Business Basics for Entrepreneurs Analytical and Logical Thinking Skills Entrepreneurship Management Constitution of India Value Education Physical and Mental Health using Yoga NSS NCC Indian Traditional Knowledge Indian Art Form	3 3 3 3 3 3 3 3 4 0 0 0 0 1 1 0 0	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	P 2 2 2 0 1 2 2 0 2 2 0 0	3 3 3 3 3 15 C C 0 0 0 0 0 0

## Program Articulation: B.Tech. in Biotechnology with Specialization in Genetic Engineering

				Р	rog	ram	Lea	arni	ng (	Outo	com	es (	PLO	<b>D</b> )		
						Grad	uate	Attrib	outes						PSO	
Course Code	Course Name	Engineering Knowledge	Problem Analysis	Design & Development	→ Analysis, Design, Research	Modern Tool Usage	Society & Culture	Environment & Sustainability	Ethics	Individual & Team Work	Communication	ProjectMgt. & Finance	Life Long Learning	H PSO-1	PSO-2	PSO - 3
18BTC101J	Biochemistry	М	М	Н	H	H	Н	М	Н	Н	Н	Н	Н	Н	Н	Н
18BTC102J	Cell Biology	М	М	Н	Н	Н	М	М	Н	Н	Н	Н	Н	Н	Н	Н
18BTC103J	Microbiology	М	М	Н	Н	Н	Н	Н	Н	Н	Н	Н	Н	Н	Н	Н
18BTC104T	Genetics and Cytogenetics	Н	Н	Н	Н	Н	Н	М	М	Н	Н	Н	Н	Н	Н	Н
18BTC105J	Molecular Biology	Н	Н	М	Н	Н	Н	М	Н	Н	Н	Н	Н	Н	Н	Н
18BTC106J	Immunology	Μ	Н	М	Н	Н	М	М	Н	Н	Н	Н	Н	Н	Н	Н
18BTC107J	Bioprocess Principles	Н	Н	Н	Н	Н	Н	Н	Н	Н	Н	Н	Н	Н	Н	Н
		М	Н	Н	Н	Н	Н	Н	Н	Н	Н	Н	Н	Н	Н	Н
18BTC201J	Gene manipulation and Genomics	Н	Н	Н	Н	Н	Н	Н	Н	Н	Н	Н	Н	Н	Н	Н
18BTC202J	Bioprocess Engineering	Н	Н	Н	Н	Н	Н	Н	Н	Н	Н	Н	Н	Н	Н	Н
18BTC203J	Animal Biotechnology	М	Н	Н	Н	Н	Н	Н	Н	Н	Н	Н	Н	Н	Н	Н
18BTC20 <mark>4T</mark>	Protein engineering and proteomics	Н	Н	Н	Н	Н	Н	Н	М	Н	Н	Н	Н	Н	Н	Н
		Н	Н	Н	Н	Н	Н	Н	Н	Н	Н	Н	Н	Н	Н	Н
18BTE420T	Human Genetics	М	М	Н	Н	Н	Н	М	Н	Н	Н	Н	Н	Н	Н	Н
18BTE421T	High Throughput Technologies in advanced biology	М	М	Н	Н	Н	М	М	Н	Н	Н	Н	Н	Н	Н	Н
18BTE422T	Metabolic Engineering of microbes	М	М	Н	Н	Н	Н	Н	Н	Н	Н	Н	Н	Н	Н	Н
		Н	Н	Н	Н	Н	Н	М	М	Н	Н	Н	Н	Н	Н	Н
18BTE424T	Molecular biology of Infectious diseases	Н	Н	М	Н	Н	Н	М	Н	Н	Н	Н	Н	Н	Н	Н
	Molecular Diagnostics	М	Н	М	Н	Н	М	М	Н	Н	Н	Н	Н	Н	Н	Н
18BTE426T	Gene therapy	Н	Н	Н	Н	Н	Н	Н	Н	Н	Н	Н	Н	Н	Н	Н
	Functional genomics	М	Н	Н	Н	Н	Н	Н	Н	Н	Н	Н	Н	Н	Н	Н
18BTE428T	Plant Interactions	М	Н	Н	Н	Н	Н	Н	Н	Н	Н	Н	Н	Н	Н	Н
18BTP101L	Massive Open Online Course - I	Н	Μ	М	Μ	М	М	М	М	Н	Н	Н	М	Н	Н	Н
	Industrial Training-I	Н	М	М	М	М	М	М	М	Н	Н	Н	М	Н	Н	Н
18BTP103L	Seminar - I	Н	М	М	М	М	М	М	М	Н	Н	Н	М	Н	Н	Н
	Massive Open Online Course - II	Н	М	М	М	М	М	М	М	Н	Н	Н	М	Н	Н	Н
	Industrial Training-II	Н	М	М	М	М	М	М	М	Н	Н	Н	М	Н	Н	Н
	Seminar - II	Н	М	М	М	М	М	М	М	Н	Н	Н	М	Н	Н	Н
18BTP107L	Minor Project	Н	Н	Н	Н	Н	М	М	Н	Н	Н	Н	Н	Н	М	М
	Internship (4-6 weeks)	Н	Н	Н	Н	Н	М	М	Н	Н	Н	Н	Н	Н	М	М
18BTP109L	Project	Н	Н	Н	Н	Н	М	М	Н	Н	Н	Н	Н	Н	М	М
18BTP110L	Semester Internship	Н	Н	Н	Н	Н	М	М	Н	Н	Н	Н	Н	Н	М	М
	Program Average	Н	Н	Н	Н	Н	Н	Н	Н	Н	Н	Н	Н	Н	Н	Н

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

Semester - I						Semester - II				
Course Title	_	urs/V	Veek P	С	Code	Course Title	Hou	rs/ W	/eek	С
English	2	_	2	3	18LEH10XJ	Chinese / French / German / Japanese/ Korean		0	2	3
Calculus and Linear Algebra	3	1	0	4			3	1	0	4
	3	1	2	5						5
	1	0	1	2						5
										1
	1						Ľ			Ŭ
	0	0	2	0			0	0	2	0
Total Learning Credit	s			20	18GNM104L					
						Total Learning Credits	i			21
Compostor, III						Compater IV				
Semester - III	Но	ire/V	Maak			Semester - IV	Ног	re/M	look	
Course Title	L	Т	Р	C	Code	Course Title	L	Τ	Р	С
	3	0	0	3			3	0	0	3
Cell Biology										
Constinue and Cutagonation					18B1C108J					
Management Principles for Engineers					18PDH103T					
	0	0	2	0	18PDM204L	Business Basics for Entrepreneurs	0	0	2	0
	s			23			1	0	0	0
Semester - V	I					Semester - VI				
Course Title	Hou			С	III			irs/ W		_
Course Title	L	T			Code	Course Title	L	T	P	С
Chemical Engineering Practice	0	0	4	2	18MAB303T	Bio-Statistics for Biotechnologists	L 3	T 1	P 0	C 4
Chemical Engineering Practice Gene manipulation and Genomics	3	0	4	2 4	18MAB303T 18BTC203J	Bio-Statistics for Biotechnologists Animal Biotechnology	3 3	T 1	P 0 2	4
Chemical Engineering Practice Gene manipulation and Genomics Bioprocess Engineering	3 3	0 0	2 2	2 4 4	18MAB303T 18BTC203J 18BTC204T	Bio-Statistics for Biotechnologists Animal Biotechnology Protein engineering and proteomics	3 3 3	T 1 0	P 0 2 0	4 4 3
Chemical Engineering Practice Gene manipulation and Genomics Bioprocess Engineering Professional Elective – 1	0 3 3 3	0 0 0	4 2 2 0	2 4 4 3	18MAB303T 18BTC203J 18BTC204T	Bio-Statistics for Biotechnologists Animal Biotechnology Protein engineering and proteomics Comprehension	3 3 3 0	T 1 0 0	P 0 2 0 0	4 4 3 1
Chemical Engineering Practice Gene manipulation and Genomics Bioprocess Engineering Professional Elective – 1 Professional Elective – 2	0 3 3 3	0 0 0 0	4 2 2 0 0	2 4 4 3 3	18MAB303T 18BTC203J 18BTC204T	Bio-Statistics for Biotechnologists Animal Biotechnology Protein engineering and proteomics Comprehension Professional Elective – 3	3 3 3 0 3	T 1 0 0 1	P 0 2 0 0	4 4 3 1 3
Chemical Engineering Practice Gene manipulation and Genomics Bioprocess Engineering Professional Elective – 1 Professional Elective – 2 Open Elective – 2	0 3 3 3 3 3	0 0 0 0 0	4 2 2 0 0	2 4 4 3 3 3	18MAB303T 18BTC203J 18BTC204T	Bio-Statistics for Biotechnologists Animal Biotechnology Protein engineering and proteomics Comprehension Professional Elective – 3 Professional Elective – 4	3 3 3 0 3 3	T 1 0 0 1 0	P 0 2 0 0 0	4 4 3 1 3 3
Chemical Engineering Practice Gene manipulation and Genomics Bioprocess Engineering Professional Elective – 1 Professional Elective – 2 Open Elective – 2 Open Elective – 3	0 3 3 3	0 0 0 0 0	4 2 2 0 0	2 4 4 3 3	18MAB303T 18BTC203J 18BTC204T 18BTC350T	Bio-Statistics for Biotechnologists Animal Biotechnology Protein engineering and proteomics Comprehension Professional Elective – 3 Professional Elective – 4 Open Elective – 4	3 3 3 0 3 3 3	T 1 0 0 1 0 0	P 0 2 0 0 0 0	4 4 3 1 3 3 3
Chemical Engineering Practice Gene manipulation and Genomics Bioprocess Engineering Professional Elective – 1 Professional Elective – 2 Open Elective – 2 Open Elective – 3 Massive Open Online Course - I	0 3 3 3 3 3	0 0 0 0 0	4 2 2 0 0	2 4 4 3 3 3	18MAB303T 18BTC203J 18BTC204T 18BTC350T	Bio-Statistics for Biotechnologists Animal Biotechnology Protein engineering and proteomics Comprehension Professional Elective – 3 Professional Elective – 4 Open Elective – 4 Employability Skills and Practices	3 3 3 0 3 3	T 1 0 0 1 0	P 0 2 0 0 0	4 4 3 1 3 3
Chemical Engineering Practice Gene manipulation and Genomics Bioprocess Engineering Professional Elective – 1 Professional Elective – 2 Open Elective – 2 Open Elective – 3 Massive Open Online Course - I Industrial Training-I	0 3 3 3 3 3	0 0 0 0 0	4 2 2 0 0 0	2 4 4 3 3 3 3	18MAB303T 18BTC203J 18BTC204T 18BTC350T 18PDH201T 18BTP104L	Bio-Statistics for Biotechnologists Animal Biotechnology Protein engineering and proteomics Comprehension Professional Elective – 3 Professional Elective – 4 Open Elective – 4 Employability Skills and Practices Massive Open Online Course - II	3 3 0 3 3 3 0	T 1 0 0 1 0 0 0	P 0 2 0 0 0 0 0 2	4 4 3 1 3 3 3 1
Chemical Engineering Practice Gene manipulation and Genomics Bioprocess Engineering Professional Elective – 1 Professional Elective – 2 Open Elective – 2 Open Elective – 3 Massive Open Online Course - I Industrial Training-I Seminar - I Analytical and Logical Thinking Skills	0 3 3 3 3 3 3 0	0 0 0 0 0 0	4 2 2 0 0 0 0	2 4 4 3 3 3 3 1	18MAB303T 18BTC203J 18BTC204T 18BTC350T 18PDH201T 18BTP104L 18BTP105L	Bio-Statistics for Biotechnologists Animal Biotechnology Protein engineering and proteomics Comprehension Professional Elective – 3 Professional Elective – 4 Open Elective – 4 Employability Skills and Practices Massive Open Online Course - II Industrial Training-II	3 3 3 0 3 3 3	T 1 0 0 1 0 0	P 0 2 0 0 0 0	4 4 3 1 3 3 3
Chemical Engineering Practice Gene manipulation and Genomics Bioprocess Engineering Professional Elective – 1 Professional Elective – 2 Open Elective – 2 Open Elective – 3 Massive Open Online Course - I Industrial Training-I Seminar - I Analytical and Logical Thinking Skills Entrepreneurship Management	0 3 3 3 3 3	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	4 2 0 0 0 0 2	2 4 4 3 3 3 1	18MAB303T 18BTC203J 18BTC204T 18BTC350T 18PDH201T 18BTP104L 18BTP105L 18BTP106L	Bio-Statistics for Biotechnologists Animal Biotechnology Protein engineering and proteomics Comprehension Professional Elective – 3 Professional Elective – 4 Open Elective – 4 Employability Skills and Practices Massive Open Online Course - II Industrial Training-II Seminar - II	3 3 0 3 3 3 0	T 1 0 0 1 0 0 0	P 0 2 0 0 0 0 0 2	4 4 3 1 3 3 3 1
Chemical Engineering Practice Gene manipulation and Genomics Bioprocess Engineering Professional Elective – 1 Professional Elective – 2 Open Elective – 2 Open Elective – 3 Massive Open Online Course - I Industrial Training-I Seminar - I Analytical and Logical Thinking Skills Entrepreneurship Management Indian Traditional Knowledge	0 3 3 3 3 3 3 0	0 0 0 0 0 0	4 2 2 0 0 0 0	2 4 4 3 3 3 3 1	18MAB303T 18BTC203J 18BTC204T 18BTC350T 18PDH201T 18BTP104L 18BTP105L 18BTP106L	Bio-Statistics for Biotechnologists Animal Biotechnology Protein engineering and proteomics Comprehension Professional Elective – 3 Professional Elective – 4 Open Elective – 4 Employability Skills and Practices Massive Open Online Course - II Industrial Training-II Seminar - II Indian Art Form	L 3 3 0 3 3 3 0 0	T 1 0 0 1 0 0 0 0	P 0 2 0 0 0 0 0 2 2	4 4 3 1 3 3 3 1
Chemical Engineering Practice Gene manipulation and Genomics Bioprocess Engineering Professional Elective – 1 Professional Elective – 2 Open Elective – 2 Open Elective – 3 Massive Open Online Course - 1 Industrial Training-I Seminar - 1 Analytical and Logical Thinking Skills Entrepreneurship Management Indian Traditional Knowledge Total Learning Credit	0 3 3 3 3 3 3 0	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	4 2 0 0 0 0 2	2 4 4 3 3 3 3 1	18MAB303T 18BTC203J 18BTC204T 18BTC350T 18PDH201T 18BTP104L 18BTP105L 18BTP106L	Bio-Statistics for Biotechnologists Animal Biotechnology Protein engineering and proteomics Comprehension Professional Elective – 3 Professional Elective – 4 Open Elective – 4 Employability Skills and Practices Massive Open Online Course - II Industrial Training-II Seminar - II Indian Art Form Total Learning Credits	L 3 3 0 3 3 3 0 0	T 1 0 0 1 0 0 0 0	P 0 2 0 0 0 0 0 2 2	4 4 3 1 3 3 3 1 1
Chemical Engineering Practice Gene manipulation and Genomics Bioprocess Engineering Professional Elective – 1 Professional Elective – 2 Open Elective – 2 Open Elective – 3 Massive Open Online Course - I Industrial Training-I Seminar - I Analytical and Logical Thinking Skills Entrepreneurship Management Indian Traditional Knowledge Total Learning Credit	0 3 3 3 3 3 3 3 0	0 0 0 0 0 0 0 0	4 2 2 0 0 0 0 2 2 2 0	2 4 4 3 3 3 3 1 0 0 23	18MAB303T 18BTC203J 18BTC204T 18BTC350T 18BTC350T 18PDH201T 18BTP104L 18BTP105L 18BTP106L 18LEM110L	Bio-Statistics for Biotechnologists Animal Biotechnology Protein engineering and proteomics Comprehension Professional Elective – 3 Professional Elective – 4 Open Elective – 4 Employability Skills and Practices Massive Open Online Course - II Industrial Training-II Seminar - II Indian Art Form Total Learning Credits	L 3 3 3 0 3 3 3 0 0	T 1 0 0 0 1 0 0 0 0 0 0 0 0 0 0 0 0 0 0	P 0 2 0 0 0 0 0 2 2 2 2 2	4 4 3 1 3 3 3 3 1 1 1 0 23
Chemical Engineering Practice Gene manipulation and Genomics Bioprocess Engineering Professional Elective – 1 Professional Elective – 2 Open Elective – 2 Open Elective – 3 Massive Open Online Course - I Industrial Training-I Seminar - I Analytical and Logical Thinking Skills Entrepreneurship Management Indian Traditional Knowledge Total Learning Credit  Semester - VII Course Title	0 3 3 3 3 3 3 3 3 0 0	0 0 0 0 0 0 0 0 0	2 0 0 0 2 2 2 0	2 4 4 3 3 3 3 1 1 0 0 23	18MAB303T 18BTC203J 18BTC204T 18BTC350T 18BTDH201T 18BTP104L 18BTP105L 18BTP106L 18LEM110L	Bio-Statistics for Biotechnologists Animal Biotechnology Protein engineering and proteomics Comprehension Professional Elective – 3 Professional Elective – 4 Open Elective – 4 Employability Skills and Practices Massive Open Online Course - II Industrial Training-II Seminar - II Indian Art Form  Total Learning Credits  Semester - VIII Course Title	L 3 3 3 0 0 3 3 3 0 0 0 0 0 0 0 0 0 0 0	T 1 0 0 0 1 0 0 0 0 0 0 0 0 0 Tars/ W	P 0 2 0 0 0 0 0 2 2 2 2 2 P	4 4 3 1 3 3 3 1 1 1 0 23
Chemical Engineering Practice Gene manipulation and Genomics Bioprocess Engineering Professional Elective – 1 Professional Elective – 2 Open Elective – 2 Open Elective – 3 Massive Open Online Course - I Industrial Training-I Seminar - I Analytical and Logical Thinking Skills Entrepreneurship Management Indian Traditional Knowledge Total Learning Credit  Semester - VII Course Title Bioseparation Technology	0 3 3 3 3 3 3 3 3 0 0 1 1 1 1 1 1 1 1 1	0 0 0 0 0 0 0 0 0 0	2 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	2 4 4 3 3 3 3 1 0 0 0 23	18MAB303T 18BTC203J 18BTC204T 18BTC350T 18BTC350T 18BTP104L 18BTP105L 18BTP106L 18LEM110L Code 18BTP109L	Bio-Statistics for Biotechnologists Animal Biotechnology Protein engineering and proteomics Comprehension Professional Elective – 3 Professional Elective – 4 Open Elective – 4 Employability Skills and Practices Massive Open Online Course - II Industrial Training-II Seminar - II Indian Art Form Total Learning Credits  Semester - VIII Course Title Project	L 3 3 3 0 0 3 3 3 0 0 0 0 0 0 0 0 0 0 0	T 1 0 0 0 1 0 0 0 0 0 0 0 0 0 Tars/ W	P 0 2 0 0 0 0 0 2 2 2 2 2 P	4 4 3 1 3 3 3 1 1 1 0 23
Chemical Engineering Practice Gene manipulation and Genomics Bioprocess Engineering Professional Elective – 1 Professional Elective – 2 Open Elective – 2 Open Elective – 3 Massive Open Online Course - I Industrial Training-I Seminar - I Analytical and Logical Thinking Skills Entrepreneurship Management Indian Traditional Knowledge Total Learning Credit  Semester - VII Course Title Bioseparation Technology Professional Elective – 5	0 3 3 3 3 3 3 3 0 0 1 1 S	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	2 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	2 4 4 3 3 3 3 1 0 0 23	18MAB303T 18BTC203J 18BTC204T 18BTC350T 18BTC350T 18BTP104L 18BTP105L 18BTP106L 18LEM110L Code 18BTP109L	Bio-Statistics for Biotechnologists Animal Biotechnology Protein engineering and proteomics Comprehension Professional Elective – 3 Professional Elective – 4 Open Elective – 4 Employability Skills and Practices Massive Open Online Course - II Industrial Training-II Seminar - II Indian Art Form Total Learning Credits  Semester - VIII Course Title Project	L 3 3 3 0 0 3 3 3 0 0 0 0 0 0 0 0 0 0 0	T 1 0 0 0 1 0 0 0 0 0 0 0 0 0 Tars/ W	P 0 2 0 0 0 0 0 2 2 2 2 2 P	4 4 3 1 3 3 3 1 1 1 0 23
Chemical Engineering Practice Gene manipulation and Genomics Bioprocess Engineering Professional Elective – 1 Professional Elective – 2 Open Elective – 2 Open Elective – 3 Massive Open Online Course - I Industrial Training-I Seminar - I Analytical and Logical Thinking Skills Entrepreneurship Management Indian Traditional Knowledge Total Learning Credit  Semester - VII  Course Title Bioseparation Technology Professional Elective – 5 Professional Elective – 6	0 3 3 3 3 3 3 3 0 0 1 1 1 1 1 1 1 1 1 1	0 0 0 0 0 0 0 0 0 0	2 0 0 0 2 2 2 0	2 4 4 3 3 3 3 1 0 0 23	18MAB303T 18BTC203J 18BTC204T 18BTC350T 18BTC350T 18BTP104L 18BTP105L 18BTP106L 18LEM110L Code 18BTP109L	Bio-Statistics for Biotechnologists Animal Biotechnology Protein engineering and proteomics Comprehension Professional Elective – 3 Professional Elective – 4 Open Elective – 4 Employability Skills and Practices Massive Open Online Course - II Industrial Training-II Seminar - II Indian Art Form Total Learning Credits  Semester - VIII Course Title Project	L 3 3 3 0 0 3 3 3 0 0 0 0 0 0 0 0 0 0 0	T 1 0 0 0 1 0 0 0 0 0 0 0 0 0 Tars/ W	P 0 2 0 0 0 0 0 2 2 2 2 2 P	4 4 3 1 3 3 3 1 1 1 0 23
Chemical Engineering Practice Gene manipulation and Genomics Bioprocess Engineering Professional Elective – 1 Professional Elective – 2 Open Elective – 2 Open Elective – 3 Massive Open Online Course - I Industrial Training-I Seminar - I Analytical and Logical Thinking Skills Entrepreneurship Management Indian Traditional Knowledge Total Learning Credit  Semester - VII  Course Title Bioseparation Technology Professional Elective – 5 Professional Elective – 6 Open Elective – 5	0 3 3 3 3 3 3 3 0 0 1 1 5 S	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	2 0 0 0 2 2 2 0	2 4 4 3 3 3 3 1 0 0 23	18MAB303T 18BTC203J 18BTC204T 18BTC350T 18BTC350T 18BTP104L 18BTP105L 18BTP106L 18LEM110L Code 18BTP109L	Bio-Statistics for Biotechnologists Animal Biotechnology Protein engineering and proteomics Comprehension Professional Elective – 3 Professional Elective – 4 Open Elective – 4 Employability Skills and Practices Massive Open Online Course - II Industrial Training-II Seminar - II Indian Art Form Total Learning Credits  Semester - VIII Course Title Project	L 3 3 3 0 0 3 3 3 0 0 0 0 0 0 0 0 0 0 0	T 1 0 0 0 1 0 0 0 0 0 0 0 0 0 Tars/ W	P 0 2 0 0 0 0 0 2 2 2 2 2 P	4 4 3 1 3 3 3 1 1 1 0 23
Chemical Engineering Practice Gene manipulation and Genomics Bioprocess Engineering Professional Elective – 1 Professional Elective – 2 Open Elective – 2 Open Elective – 3 Massive Open Online Course - I Industrial Training-I Seminar - I Analytical and Logical Thinking Skills Entrepreneurship Management Indian Traditional Knowledge Total Learning Credit  Semester - VII  Course Title Bioseparation Technology Professional Elective – 5 Professional Elective – 6 Open Elective – 5 Minor Project	0 3 3 3 3 3 3 3 0 0 1 1 5 S	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	2 0 0 0 2 2 2 0	2 4 4 3 3 3 3 1 0 0 23	18MAB303T 18BTC203J 18BTC204T 18BTC350T 18BTC350T 18BTP104L 18BTP105L 18BTP106L 18LEM110L Code 18BTP109L	Bio-Statistics for Biotechnologists Animal Biotechnology Protein engineering and proteomics Comprehension Professional Elective – 3 Professional Elective – 4 Open Elective – 4 Employability Skills and Practices Massive Open Online Course - II Industrial Training-II Seminar - II Indian Art Form Total Learning Credits  Semester - VIII Course Title Project	L 3 3 3 0 0 3 3 3 0 0 0 0 0 0 0 0 0 0 0	T 1 0 0 0 1 0 0 0 0 0 0 0 0 0 Tars/ W	P 0 2 0 0 0 0 0 2 2 2 2 2 P	4 4 3 1 3 3 3 1 1 1 0 23
Chemical Engineering Practice Gene manipulation and Genomics Bioprocess Engineering Professional Elective – 1 Professional Elective – 2 Open Elective – 2 Open Elective – 3 Massive Open Online Course - I Industrial Training-I Seminar - I Analytical and Logical Thinking Skills Entrepreneurship Management Indian Traditional Knowledge Total Learning Credit  Semester - VII  Course Title Bioseparation Technology Professional Elective – 5 Professional Elective – 5 Open Elective – 5 Minor Project Internship (4-6 weeks)	0 3 3 3 3 3 3 3 0 0 1 1 5 S	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	2 0 0 0 0 2 2 2 0 0 0 0 0 0 0 0 0 0 0 0	2 4 4 3 3 3 3 1 0 0 23	18MAB303T 18BTC203J 18BTC204T 18BTC350T 18BTC350T 18BTP104L 18BTP105L 18BTP106L 18LEM110L Code 18BTP109L	Bio-Statistics for Biotechnologists Animal Biotechnology Protein engineering and proteomics Comprehension Professional Elective – 3 Professional Elective – 4 Open Elective – 4 Employability Skills and Practices Massive Open Online Course - II Industrial Training-II Seminar - II Indian Art Form  Total Learning Credits  Semester - VIII  Course Title  Project Semester Internship	L 3 3 3 0 0 3 3 3 0 0 0 0 0 0 0 0 0 0 0	T 1 0 0 0 1 0 0 0 0 0 0 0 0 0 Tars/ W	P 0 2 0 0 0 0 0 2 2 2 2 2 P	4 4 3 3 3 3 1 1 1 0 23
	English Calculus and Linear Algebra Physics: Electromagnetic Theory, Quantum Mechanics, Waves and Optics Engineering Graphics and Design Basic Civil and Mechanical Engineering Professional Skills and Practices Constitution of India Physical and Mental Health using Yoga Total Learning Credit  Semester - III  Course Title Human Physiology and Health Basic Chemical Engineering Biochemistry Cell Biology Microbiology Genetics and Cytogenetics Management Principles for Engineers Competencies in Social Skills Entrepreneurial Skill Development Total Learning Credit  Semester - V	English 2 Calculus and Linear Algebra 3 Physics: Electromagnetic Theory, Quantum Mechanics, Waves and Optics Engineering Graphics and Design 1 Basic Civil and Mechanical Engineering 7 Professional Skills and Practices 0 Constitution of India 1 Physical and Mental Health using Yoga 7 Total Learning Credits  Semester - III Course Title Hou L Human Physiology and Health 3 Basic Chemical Engineering 3 Biochemistry 3 Biochemistry 3 Gell Biology 3 Microbiology 3 Microbiology 3 Microbiology 3 Microbiology 3 Microbiology 3 Management Principles for Engineers 2 Competencies in Social Skills 5 Entrepreneurial Skill Development 7 Total Learning Credits	English	English	English	Calculus and Linear Algebra	English	English	English	English