



**B.Tech. BIOTECHNOLOGY**  
Minimum Credits to be Earned 172.0

**First Semester**

Code No.	Course	Objectives & Outcomes		L	T	P	C
		PEOs	POs				
18BT101	ENGINEERING MATHEMATICS I	I,II	a,b	3	1	0	4
18BT102	ENGINEERING PHYSICS I	I,II,III	a,b,i	2	0	2	3
18BT103	ENGINEERING CHEMISTRY I	I,II	a,b	2	0	2	3
18BT104	COMPUTER PROGRAMMING	I,II	a,b,c,e	2	0	2	3
18HS101	COMMUNICATIVE ENGLISH I	I,II,III	i,j	1	0	2	2
18BT106	BIOTECHNOLOGY LABORATORY PRACTICES	I,II,III	c,d,e,i,j,k,n,o	0	0	4	2
<b>Total</b>				10	1	12	17.0

**Second Semester**

Code No.	Course	Objectives & Outcomes		L	T	P	C
		PEOs	POs				
18BT201	ENGINEERING MATHEMATICS II	I,II	a,b	3	1	0	4
18BT202	ENGINEERING PHYSICS II	I,II,III	a,b,i	2	0	2	3
18BT203	ENGINEERING CHEMISTRY II	I,II	a,b,c,e	2	0	2	3
18BT204	BASICS OF ELECTRICAL AND ELECTRONICS ENGINEERING	I,II	a,b	2	0	2	3
	LANGUAGE ELECTIVE	-	-	-	-	-	2
18BT206	BIOCHEMISTRY	I,II,III	a,b,c,g,i,k,n	3	0	0	3
18BT207	BASICS OF BIOTECHNOLOGY	I,II	a,b,c,n,o	3	0	0	3
<b>Total</b>				15	1	6	21.0

**Third Semester**

Code No.	Course	Objectives & Outcomes		L	T	P	C
		PEOs	POs				
18BT301	ENGINEERING MATHEMATICS III	I,II	a,b	3	1	0	4
18BT302	PROCESS CALCULATIONS AND UNIT OPERATIONS	I,II	a,b,c	3	0	2	4
18BT303	INSTRUMENTATION AND ANALYTICAL TECHNIQUES	I,II	a,b,c,d,e,m	3	0	0	3
18BT304	CELL BIOLOGY	I,II	a,b,d,n	3	0	0	3
18BT305	BIOORGANIC CHEMISTRY	I,II	a,b,d,e,h,n	3	0	0	3
18BT306	MICROBIOLOGY	I,II,III	a,c,g,i,m,o	3	0	0	3
18BT307	MICROBIOLOGY LAB	I,II,III	a,c,g,i,m	0	0	4	2
18BT308	BIOCHEMISTRY AND BIOORGANIC CHEMISTRY LAB	I,II,III	c,d,e,i,j,m,n	0	0	4	2
18GE301	SOFT SKILLS - VERBAL ABILITY	-	-	2	0	0	0
<b>Total</b>				20	1	10	24.0

**Fourth Semester**

Code No.	Course	Objectives & Outcomes		L	T	P	C
		PEOs	POs				
18BT401	BIOPROCESS ENGINEERING	I,II	a,b,c,m	3	1	0	4
18BT402	FUNDAMENTALS OF TRANSPORT PROCESS	I,II	a,b,c,m	3	1	0	4
18BT403	IMMUNOLOGY	I,II,III	a,b,c,d,f,g,h,n	3	0	2	4
18BT404	MOLECULAR BIOLOGY	I,II,III	a,d,g,i,m,n	3	0	0	3
18BT405	PHARMACOGNOSY AND PHARMACOLOGY	I,II	a,b,c,d,n,o	3	0	0	3
18BT406	CHEMICAL THERMODYNAMICS	I,II	a,b,c,m	3	1	0	4
18BT407	BIOPROCESS LABORATORY	I,II,III	c,d,e,i,j,m	0	0	4	2
18BT408	MOLECULAR BIOLOGY LABORATORY	I,II,III	a,b,d,e,i,n	0	0	4	2
18HS001	ENVIRONMENTAL SCIENCE	I,II	a,b	2	0	0	0
18GE401	SOFT SKILLS-REASONING	-	-	2	0	0	0
<b>Total</b>				22	3	10	26.0

**Fifth Semester**

Code No.	Course	Objectives & Outcomes		L	T	P	C
		PEOs	POs				
18BT501	DOWNSTREAM PROCESSING	I,II,III	a,b,c,e,f,i,n	3	1	0	4
18BT502	NANO BIOTECHNOLOGY	I,II	a,b,c,d,e,h,m,n	3	0	2	4
18BT503	GENETIC ENGINEERING	I,II,III	a,b,e,f,h,m,n	3	0	0	3
18BT504	PLANT TISSUE CULTURE	I,II,III	a,b,c,f,g,h,k,m	3	0	0	3
	PROFESSIONAL ELECTIVE I	-	-	-	-	-	3
	PROFESSIONAL ELECTIVE II	-	-	-	-	-	3
18BT507	GENETIC ENGINEERING LABORATORY	I,II,III	a,b,d,e,i,n	0	0	4	2
18BT508	DOWNSTREAM PROCESSING LABORATORY	I,II,III	c,d,e,i,n	0	0	4	2
18GE501	SOFT SKILLS - APTITUDE I	-	-	0	0	2	0
<b>Total</b>				12	1	12	24.0

**Sixth Semester**

Code No.	Course	Objectives &Outcomes		L	T	P	C
		PEOs	POs				
18HS002	PROFESSIONAL ETHICS IN ENGINEERING	I,II,III	f,g,h,i,j,k,l	2	0	0	2
18BT602	BIOPHARMACEUTICAL TECHNOLOGY	I,II	a,b,c,m,n	3	0	0	3
18BT603	BIOINFORMATICS	I,II	a,b,c,m	3	0	2	4
18BT604	ANIMAL CELL CULTURE	I,II,III	a,c,f,h,n	3	0	0	3
	PROFESSIONAL ELECTIVE III	-	-	-	-	-	3
	PROFESSIONAL ELECTIVE IV	-	-	-	-	-	3
18BT607	TISSUE CULTURE LABORATORY	I,II,III	a,b,c,g,h,m	0	0	4	2
18BT608	BIOPHARMACEUTICAL TECHNOLOGY LABORATORY	I,II,III	c,d,e,i,n	0	0	4	2
18GE601	SOFT SKILLS-APTITUDE II	-	-	0	0	2	0
Total				11	0	12	22.0
Seventh Semester							
Code No.	Course	Objectives &Outcomes		L	T	P	C
		PEOs	POs				
18HS003	PRINCIPLES OF MANAGEMENT	-	-	2	0	0	2
18BT702	BIOBUSINESS	I,II,III	a,b,c,f,i,j,k,n,o	3	0	0	3
18BT703	ENZYME AND PROTEIN ENGINEERING	I,II,III	a,b,c,d,k,n	3	0	0	3
18BT704	SYSTEMS BIOLOGY	I,II	a,b,c,m	3	0	0	3
	PROFESSIONAL ELECTIVE V	-	-	-	-	-	3
	PROFESSIONAL ELECTIVE VI	-	-	-	-	-	3
18BT707	PROJECT WORK I	I,II,III	a,b,c,d,e,f,g,h,i,j,k,l,m,n,o	0	0	6	3
Total				11	0	6	20.0
Eight Semester							
Code No.	Course	Objectives &Outcomes		L	T	P	C
		PEOs	POs				
	PROFESSIONAL ELECTIVE VII	-	-	-	-	-	3
	PROFESSIONAL ELECTIVE VIII	-	-	-	-	-	3
	PROFESSIONAL ELECTIVE IX	-	-	-	-	-	3
18BT804	PROJECT WORK II	I,II,III	a,b,c,d,e,f,g,h,i,j,k,l,m,n,o	0	0	18	9
Total				0	0	18	18.0
Electives							
Code No.	Course	Objectives &Outcomes		L	T	P	C
		PEOs	POs				
LANGUAGE ELECTIVES							
18HSC01	CHINESE	-	-	1	0	2	2
18HSF01	FRENCH	I,II	j	1	0	2	2
18HSH01	HINDI	-	-	1	0	2	2
18HSJ01	JAPANESE	-	-	1	0	2	2
DISCIPLINE ELECTIVES							
18BT021	GENETICS	I,II,III	a,b,c,d,f,m,n	3	0	0	3
ONE CREDIT COURSES							
18BT0XB	TRANSLATIONAL RESEARCH AND TECHNOLOGY TRANSFER	I,III	a,i	1	0	0	1
18BT0XC	MARINE FOOD TECHNOLOGY	I,III	a,i	1	0	0	1
18BT0XD	BEVERAGE, BAKING AND CONFECTIONARY TECHNOLOGY	I,III	a,i	1	0	0	1
18BT0XE	APPLIED SYSTEMS BIOLOGY	I,II,III	a,i,k	1	0	0	1
18BT0XF	FUNDAMENTALS OF LIQUID CHROMATOGRAPHY	I,III	a,i	1	0	0	1
18BT0XG	PROCESS VALIDATION AND QUALITY ASSURANCE FOR BIOPRODUCTS	I,II,III	g,i,j,k,l	1	0	0	1
18BT0XH	DIAGNOSTICS AND HEALTH CARE	-	-	1	0	0	1
18BT0XI	CLINICAL RESEARCH	I,II	a,b,c,e	1	0	0	1
18BT0XJ	MEDICAL CODING	-	-	1	0	0	1
18BT0XK	PRODUCTION AND CHARACTERIZATION OF THERAPUTIC MONOCLONAL ANTIBODIES	I,II	a,c,d,m,n	1	0	0	1
18BT0XL	PRODUCTION OF BIOPHARMACEUTICALS	I,II,III	a,b,e,f,g,h,l,m	1	0	0	1
18BT0XM	ALGAE FOR HEALTH AND WEALTH	I,II,III	a,c,f,g,i,k	1	0	0	1
SPECIAL COURSES							
18BTV01	ELECTROPHORETIC TECHNIQUES AND BIOMOLECULES CHARACTERIZATION	I,II	a,c,d,m	1	0	0	0
OPEN ELECTIVES							
18BT0YD	MOLECULAR SIMULATIONS	I,II,III	a,b,c,d,e,f,i,l,n	3	0	0	3
18GE0C1	CORROSION SCIENCE AND ENGINEERING	I,II,III	a,b,g	3	0	0	3
18GE0C2	ENERGY STORING DEVICES	I,II,III	a,b,g	3	0	0	3
18GE0C3	POLYMER SCIENCE	I,II,III	a,b,c,g	3	0	0	3
18GE0P1	NANOMATERIALS SCIENCE	-	-	3	0	0	3

18GE0P2	SEMICONDUCTOR PHYSICS AND DEVICES	-	-	3	0	0	3
18GE0P3	APPLIED LASER SCIENCE	-	-	3	0	0	3
18GE0P4	BIO-PHOTONICS	-	-	3	0	0	3
18GE0P5	PHYSICS OF SOFT MATTER	-	-	3	0	0	3
<b>ADDITIONAL ONE CREDIT COURSE</b>							
18GE0XA	ETYMOLOGY	-	-	1	0	0	1
18GE0XB	GENERAL PSYCHOLOGY	-	-	1	0	0	1
18GE0XC	NEURO BEHAVIORAL SCIENCE	III	i	1	0	0	1
18GE0XD	VISUAL MEDIA AND FILM MAKING	I,II,III	b,f	1	0	0	1
18GE0XE	YOGA FOR HUMAN EXCELLENCE	-	-	1	0	0	1
18GE0XF	VEDIC MATHEMATICS	-	-	1	0	0	1
18GE0XG	HEALTH AND FITNESS	-	-	1	0	0	1
18GE0XH	CONCEPT, METHODOLOGY AND APPLICATIONS OF VERMICOMPOSTING	-	-	1	0	0	1
18GE0XI	BLOG WRITING	I,II,III	f,g,j	1	0	0	1
18GE0XJ	INTERPERSONAL SKILLS	-	-	1	0	0	1
18GE0XL	NATIONAL CADET CORPS	III	g,i	1	0	0	1
18GE0XM	COMMUNITY SERVICE AND LEADERSHIP DEVELOPMENT	-	-	1	0	0	1
18GE0XN	DISRUPTIVE INNOVATION BASED STARTUP ACTIVITIES	-	-	1	0	0	1
18GE0XO	SOCIAL PSYCHOLOGY	III	i	1	0	0	1
18GE0XP	FM RADIO BROADCASTING TECHNOLOGY	-	-	1	0	0	1
18GE0XQ	Introduction to MATLAB	-	-	1	0	0	1
18GE0XR	INDIA VISION PROGRAM	-	-	1	0	0	1
<b>LANGUAGE ELECTIVES</b>							
18HS201	COMMUNICATIVE ENGLISH II	I,II,III	i,j	1	0	2	2
18HSG01	GERMAN	-	-	1	0	2	2
<b>DISCIPLINE ELECTIVES</b>							
18BT001	CANCER BIOLOGY	I,II	a,b,d,e,h,n,o	3	0	0	3
18BT002	CELLULAR BIOPHYSICS	I,II	a,b,c,m	3	0	0	3
18BT003	METABOLIC ENGINEERING	I,II,III	a,c,d,f,g,h,n	3	0	0	3
18BT004	BIOPOLYMERS	I,II,III	a,b,c,d,e,f,g,n	3	0	0	3
18BT005	BIOSENSORS	I,II,III	b,c,d,g,m	3	0	0	3
18BT006	BIOMATERIALS	I,II,III	a,b,c,d,f,h,n	3	0	0	3
18BT007	STEM CELL TECHNOLOGY	I,II,III	a,d,e,f,j,k,m,o	3	0	0	3
18BT008	GENOMICS AND PROTEOMICS	I,II	a,b,c,m	3	0	0	3
18BT009	PHARMACOVIGILANCE	I,II	a,d,e,n	3	0	0	3
18BT010	VACCINE TECHNOLOGY	I,II,III	a,b,c,d,e,f,n,o	3	0	0	3
18BT011	MOLECULAR MODELLING AND DRUG DESIGN	I,II	a,c,d,e,n	3	0	0	3
18BT012	MOLECULAR PATHOGENESIS AND DISEASE DIAGNOSIS	I,II,III	b,c,e,f,m,n	3	0	0	3
18BT013	BIOLOGICAL SPECTROSCOPY	I,II	a,b,d,e,m	3	0	0	3
18BT014	BIOPROCESS MODELLING AND SIMULATION	I,II	a,b,c,e,m	3	0	0	3
18BT015	INTELLECTUAL PROPERTY RIGHTS AND TECHNOLOGY TRANSFER	I,II,III	c,e,h,k,n,o	3	0	0	3
18BT016	BIOETHICS AND BIOSAFETY	I,II,III	c,f,g,h,o	3	0	0	3
18BT017	BIOREMEDIATION	I,II,III	c,f,g,h,o	3	0	0	3
18BT018	BIOMASS AND BIOENERGY	I,II,III	a,b,c,d,e,f,g,n,o	3	0	0	3
18BT019	WASTE MANAGEMENT AND UTILIZATION	I,II,III	a,b,c,d,e,f,g,h,o	3	0	0	3
18BT020	BIODIVERSITY AND BIOPROSPECTING	I,II,III	a,f,g,n	3	0	0	3
<b>ONE CREDIT COURSES</b>							
18BT0XA	MOLECULAR MARKER TECHNOLOGIES	I,II,III	a,i,k	1	0	0	1
<b>ADDITIONAL ONE CREDIT COURSE</b>							
18GE0XK	NEW AGE INNOVATION AND ENTREPRENEURSHIP	-	-	1	0	0	1
<b>OPEN ELECTIVES</b>							
18BT0YA	BIOFUELS	I,II,III	a,c,g,o	3	0	0	3
18BT0YB	MUSHROOM CULTIVATION AND VERMICOMPOSTING	I,II,III	b,c,e,g,n,o	3	0	0	3
18BT0YC	FORENSIC TECHNOLOGY	I,II	a,b,c,d,e,m	3	0	0	3
18AE0YA	NON-DESTRUCTIVE TESTING	-	-	3	0	0	3
18AE0YB	SMART MATERIALS	-	-	3	0	0	3
18AE0YC	FUNDAMENTALS OF AIRCRAFT ENGINEERING	-	-	3	0	0	3
18AG0YA	ENTREPRENEURSHIP DEVELOPMENT AND FOOD QUALITY MANAGEMENT FOOD INDUSTRY	-	-	3	0	0	3
18AG0YB	HUMAN ENGINEERING AND SAFETY IN AGRICULTURE	-	-	3	0	0	3
18AG0YC	ENERGY MANGEMENT IN AGRICULTURE	-	-	3	0	0	3
18AG0YD	FARM MECHANISATION	-	-	3	0	0	3
18AU0YA	AUTOMOTIVE ENGINEERING	-	-	3	0	0	3
18AU0YB	VEHICLE CONTROL SYSTEMS	-	-	3	0	0	3
18AU0YC	PUBLIC TRANSPORT MANAGEMENT	-	-	3	0	0	3
18AU0YD	TECHNOLOGIES FOR GREEN MOBILITY	-	-	3	0	0	3

18AU0YE	TROUBLE SHOOTING AND MAINTENANCE OF AUTOMOBILES	-	-	3	0	0	3
18CE0YA	GREEN BUILDINGS	-	-	3	0	0	3
18CE0YB	DISASTER PREPAREDNESS AND PLANNING	-	-	3	0	0	3
18CE0YC	ENVIRONMENTAL IMPACT ASSESSMENT	-	-	3	0	0	3
18CE0YD	BUILDING SERVICES	-	-	3	0	0	3
18CE0YE	INDUSTRIAL WASTE MANAGEMENT	-	-	3	0	0	3
18CE0YF	WEALTH FROM WASTE	-	-	3	0	0	3
18CE0YG	RISK AND SAFETY MANAGEMENT	-	-	3	0	0	3
18CE0YH	ENERGY SCIENCE AND ENGINEERING	-	-	3	0	0	3
18CE0YI	CONCEPTS OF REMOTE SENSING	-	-	3	0	0	3
18CS0YA	E-LEARNING TECHNIQUES	-	-	3	0	0	3
18CS0YB	SOFTWARE TESTING AND QUALITY ASSURANCE	-	-	3	0	0	3
18CS0YC	JAVA FUNDAMENTALS	-	-	3	0	0	3
18CS0YD	NETWORK ENGINEERING AND MANAGEMENT	-	-	3	0	0	3
18CS0YE	AGENT BASED INTELLIGENT SYSTEMS	-	-	3	0	0	3
18CS0YF	E-BUSINESS	-	-	3	0	0	3
18CS0YG	KNOWLEDGE DISCOVERY IN DATABASES	-	-	3	0	0	3
18CS0YH	SOCIAL NETWORK ANALYSIS CONCEPTS	-	-	3	0	0	3
18CS0YI	OPERATING SYSTEM CONCEPTS	-	-	3	0	0	3
18CS0YJ	OBJECT ORIENTED PROGRAMMING	-	-	3	0	0	3
18EC0YA	BASICS OF ANALOG AND DIGITAL ELECTRONICS	-	-	3	0	0	3
18EC0YB	AUTOMOTIVE ELECTRONICS	-	-	3	0	0	3
18EC0YC	PCB DESIGN AND PROTOTYPING	-	-	3	0	0	3
18EC0YD	MICROCONTROLLER PROGRAMMING	-	-	3	0	0	3
18EC0YE	ENGINEERING COMPUTATION WITH MATLAB	-	-	3	0	0	3
18EC0YF	BASICS OF HARDWARE DESCRIPTION LANGUAGES	-	-	3	0	0	3
18EC0YG	FUNDAMENTALS OF EMBEDDED SYSTEMS	-	-	3	0	0	3
18EC0YH	PRINCIPLES OF COMMUNICATION SYSTEMS	-	-	3	0	0	3
18EC0YI	ELECTRONIC PRODUCT DESIGN AND PACKAGING	-	-	3	0	0	3
18EC0YJ	PRINCIPLES OF COMPUTER COMMUNICATION AND NETWORKS	-	-	3	0	0	3
18EE0YA	ENERGY CONSERVATION AND MANAGEMENT	-	-	3	0	0	3
18EE0YB	ELECTRICAL SAFETY	-	-	3	0	0	3
18EE0YC	INDUSTRIAL DRIVES AND CONTROL	-	-	3	0	0	3
18EI0YA	PROGRAMMABLE LOGIC CONTROLLERS	-	-	3	0	0	3
18EI0YB	SENSOR TECHNOLOGY	-	-	3	0	0	3
18EI0YC	FUNDAMENTALS OF VIRTUAL INSTRUMENTATION	-	-	3	0	0	3
18EI0YD	OPTOELECTRONICS AND LASER INSTRUMENTATION	-	-	3	0	0	3
18FD0YA	TRADITIONAL FOODS	-	-	3	0	0	3
18FD0YB	FOOD LAWS AND REGULATIONS	-	-	3	0	0	3
18FD0YC	POST HARVEST TECHNOLOGY OF FRUITS AND VEGETABLES	-	-	3	0	0	3
18FT0YA	FASHION CRAFTS	-	-	3	0	0	3
18FT0YB	FASHION ACCESSORIES	-	-	3	0	0	3
18FT0YC	FASHION VISUAL MERCHANDISING	-	-	3	0	0	3
18FT0YD	INTERIOR DESIGN	-	-	3	0	0	3
18FT0YE	SURFACE EMBELLISHMENT	-	-	3	0	0	3
18GE01	BUSINESS ANALYTICS	-	-	3	0	0	3
18GE02	INDUSTRIAL SAFETY	-	-	3	0	0	3
18GE03	OPERATIONS RESEARCH	-	-	3	0	0	3
18GE04	COST MANAGEMENT OF ENGINEERING PROJECTS	-	-	3	0	0	3
18GE05	COMPOSITE MATERIALS	-	-	3	0	0	3
18GE06	WASTE TO ENERGY	-	-	3	0	0	3
18IT0YA	DATABASE MANAGEMENT SYSTEMS	-	-	3	0	0	3
18IT0YB	DATA STRUCTURES AND ALGORITHMS	-	-	3	0	0	3
18IT0YC	DATA SCIENCES AND ANALYTICS	-	-	3	0	0	3
18IT0YD	OBJECT ORIENTED PROGRAMMING	-	-	3	0	0	3
18IT0YE	ARTIFICIAL INTELLIGENCE	-	-	3	0	0	3
18ME0YA	INDUSTRIAL PROCESS ENGINEERING	-	-	3	0	0	3
18ME0YB	SAFETY ENGINEERING	-	-	3	0	0	3
18ME0YC	MAINTENANCE ENGINEERING	-	-	3	0	0	3
18ME0YD	BASICS OF NON-DESTRUCTIVE TESTING	-	-	3	0	0	3
18ME0YE	DIGITAL MANUFACTURING	-	-	3	0	0	3
18ME0YF	WORK STUDY AND ERGONOMICS	-	-	3	0	0	3
18ME0YG	METROLOGY IN INDUSTRY	-	-	3	0	0	3
18ME0YH	PLANT LAYOUT AND MATERIAL HANDLING	-	-	3	0	0	3
18ME0YI	CONCEPTS OF ENGINEERING DESIGN	-	-	3	0	0	3
18ME0YJ	OIL HYDRAULICS AND PNEUMATICS	-	-	3	0	0	3
18ME0YK	ENERGY AUDITING AND MANAGEMENT	-	-	3	0	0	3
18ME0YL	LEAN SIX SIGMA	-	-	3	0	0	3

18ME0YM	HEATING VENTILATION AND AIRCONDITIONING	-	-	3	0	0	3
18TT0YA	YARN AND FABRIC MANUFACTURE	-	-	3	0	0	3
18TT0YB	COLOURATION OF TEXTILES	-	-	3	0	0	3
18TT0YC	TEXTILES IN ENGINEERING APPLICATION	-	-	3	0	0	3
18TT0YD	GENERAL TEXTILE TECHNOLOGY	-	-	3	0	0	3

