



SETHU INSTITUTE OF TECHNOLOGY

PULLOOR, KARIAPATTI – 626115
(An Autonomous Institution
Affiliated to Anna University Chennai)

B.TECH. BIOTECHNOLOGY

CURRICULUM

REGULATIONS 2021

CHOICE BASED CREDIT SYSTEM

(Applicable to candidates admitted in the Academic Year 2021 - 2022)

Approved in the Academic Council Meeting held on
14.05.2022



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Pulloor, Kariapatti - 626 115
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B.Tech. Degree Programme
CHOICE BASED CREDIT SYSTEM

CURRICULUM

Regulation 2021 (Academic Year 2021 – 2022)

Bachelor of Technology in Biotechnology

OVERALL COURSE STRUCTURE

S.No.	Course Category	Total No. of Courses	Credits	Percentage
1	Humanities and Social Sciences (HS)	6	10	6.21 %
2	Basic Science courses (BS)	9	27	16.77 %
3	Engineering Science courses (ES)	9	21	13.04 %
4	Professional Core courses (PC)	24	58	36.03 %
5	Professional Elective (PE)	6	18	11.19 %
6	Open Elective (OE)	4	12	7.45 %
7	Project work (P)	3	13	8.07 %
8	Mandatory Courses (MC)	9	2	1.24 %
TOTAL		70	161	100

COURSE CREDITS - SEMESTER WISE

Branch	I	II	III	IV	V	VI	VII	VIII	TOTAL
BT	22	17	19	19	21.5	24	24.5	14	161

SEMESTER I

S. No.	Course Code	Course Title	Course Category	L	T	P	C
THEORY							
1.	21UEN101	English for Technical Communication (Common to ALL except CSBS)	HS	2	0	0	2
2.	21UMA102	Matrix and Calculus (Common to ALL except CSBS)	BS	3	1	0	4
3.	21UPH103	Engineering Physics (Common to ALL except CSBS)	BS	3	0	0	3
4.	21UCY105	Applied Chemistry (Common to ECE, EEE, CSE, IT, BT, BME, CSD, AIDS & AIML)	BS	3	0	0	3
5.	21UCS108	Problem Solving and Python Programming (Common to ALL except CSBS)	ES	3	0	0	3
6.	21UME109	Engineering Graphics (Common to ALL except AIDS, CSBS & CSD)	ES	3	1	0	4
PRACTICAL							
7.	21UCS110	Problem Solving and Python Programming Laboratory (Common to ALL except CSBS)	ES	0	0	2	1
8.	21UCS112	Engineering Fundamentals Lab (Common to ECE, CSE, IT, BT & BME)	ES	0	0	2	1
9.	21UGS113	Basic Sciences Laboratory - I (Common to ALL except CSBS)	BS	0	0	2	1
MANDATORY							
10.	21UGM131	Induction Program (Common to ALL)	MC	0	3	0	P/F
Total				17	5	6	22
Total Credits: 22							

SEMESTER II

S. No.	Course Code	Course Title	Course Category	L	T	P	C
THEORY							
1.	21UEN201	Communication Skills for Professionals (except CSBS)	HS	1	0	1	1.5
2.	21UMA207	Calculus, Complex Analysis and Transform Techniques (Common to AGRI, BT& BME)	BS	3	1	0	4
3.	21UPH204	Biomaterial Physics	BS	3	0	0	3
4.	21UBT204	Microbiology	ES	3	0	0	3
5.	21UBT205	Principles of Biochemistry	ES	3	0	0	3
PRACTICAL							
7.	21UGS210	Basic Sciences Laboratory - II (Common to ALL except CSBS)	BS	0	0	2	1
8.	21UBT211	Biochemistry Laboratory	ES	0	0	3	1.5
MANDATORY							
9.	21UGM231	Environmental Science (Common to ALL)	MC	3	0	0	P/F
Total				16	1	6	17
Total Credits: 17							

SEMESTER III

S.No.	Course Code	Course Title	Course Category	L	T	P	C
THEORY							
1.	21UMA326	Transform Techniques and Partial Differential Equations (Common to AGRI, BME & BT)	BS	3	1	0	4
2.	21UBT302	Stoichiometry and Fluid Mechanics	ES	3	0	0	3
3.	21UBT303	Applied Thermodynamics for Biotechnologists	PC	3	0	0	3
4.	21UBT304	Cell Biology	PC	3	0	0	3
5.	21UBT305	Biochemical Metabolism	PC	3	0	0	3
PRACTICAL							
6.	21UBT306	Microbiology Laboratory	PC	0	0	3	1.5
7.	21UBT307	Cell Biology Laboratory	PC	0	0	3	1.5
Total				15	1	6	19
Total Credits: 19							

SEMESTER IV

S.No.	Course Code	Course Title	Course Category	L	T	P	C
THEORY							
1.	21UMA424	Probability and Inferential Statistics (Common to BT & BME)	BS	3	1	0	4
2.	21UBT402	Bioprocess Principles	PC	3	0	0	3
3.	21UBT403	Basic Industrial Biotechnology	PC	3	0	0	3
4.	21UBT404	Protein Engineering	PC	3	0	0	3
5.	21UBT405	Principles of Genetics	PC	3	0	0	3
PRACTICAL							
6.	21UBT406	Chemical Engineering Laboratory	ES	0	0	3	1.5
7.	21UBT407	Instrumental Methods of Analysis Laboratory	PC	0	0	3	1.5
MANDATORY							
8.	21UGM431	Gender Equality (Common to ALL)	MC	1	0	0	P/F
Total				16	1	6	19
Total Credits: 19							

SEMESTER V

S.No.	Course Code	Course Title	Course Category	L	T	P	C
THEORY							
1.	21UBT501	Molecular Biology	PC	3	0	0	3
2.	21UBT502	Bioprocess Engineering	PC	3	0	0	3
3.	21UBT503	Mass Transfer Operations	PC	3	0	0	3
4.	PE - I	Professional Elective – I	PE	3	0	0	3
5.	OE - I	Open Elective – I	OE	3	0	0	3
PRACTICAL							
6.	21UBT506	Molecular Biology Laboratory	PC	0	0	3	1.5
7.	21UBT508	Bioprocess Laboratory - I	PC	0	0	3	1.5
SPECIAL COURSE							
8.	21UBT507	Creative Thinking and Innovation	P	0	0	2	1
9.	21UGS533	Interpersonal Skills Laboratory (Common to Mech, Civil, BT & BME)	HS	0	0	3	1.5
MANDATORY							
10.	21UGT140	Heritage of Tamil	MC	1	0	0	1
Total				16	0	11	21.5
Total Credits: 21.5							

SEMESTER VI

S.No.	Course Code	Course Title	Course Category	L	T	P	C
THEORY							
1.	21UBT601	Genetic Engineering	PC	3	0	0	3
2.	21UBT602	Bioinformatics	PC	3	0	0	3
3.	PE – II	Professional Elective – II	PE	3	0	0	3
4.	PE – III	Professional Elective – III	PE	3	0	0	3
5.	OE – II	Open Elective – II	OE	3	0	0	3
PRACTICAL							
6.	21UBT606	Genetic Engineering Laboratory	PC	0	0	3	1.5
7.	21UBT608	Bioprocess Laboratory - II	PC	0	0	3	1.5
SPECIAL COURSE							
8.	21UBT607	Product Development Project	P	0	0	8	4
9.	21UGS631	Logical Reasoning and Aptitude (Common to Civil, BT & BME)	HS	1	0	0	1
10.	21UGS632	Soft skills and Communication Laboratory	HS	0	0	2	1
MANDATORY							
11.	21UGM631	Indian Constitution (Common to ALL)	MC	1	0	0	P/F
Total				17	0	16	24
Total Credits: 24							

SEMESTER VII

S.No.	Course Code	Course Title	Course Category	L	T	P	C
THEORY							
1.	21UME701	Project Management and Finance (Common to ALL except CSBS)	HS	3	0	0	3
2.	21UBT702	Downstream Processing	PC	3	1	0	4
3.	21UBT703	Immunology	PC	3	0	0	3
4.	PE – IV	Professional Elective – IV (Through SWAYAM portal)	PE	3	0	0	3
5.	PE – V	Professional Elective – V	PE	3	0	0	3
6.	OE – III	Open Elective – III	OE	3	0	0	3
	OR						
	21UGE710	MDP Phase - I	P	0	0	3	3
PRACTICAL							
7.	21UBT707	Downstream Processing Laboratory	PC	0	0	3	1.5
8.	21UBT708	Immunology Laboratory	PC	0	0	3	1.5
9.	21UBT709	Bioinformatics Laboratory	PC	0	0	3	1.5
MANDATORY							
10.	21UBT735	Internship	MC	0	0	0	1
11.	21UGM731	Sports & Social Development (Common to ALL)	MC	-	-	-	P/F
12.	21UGM732	Skill Development (Common to ALL)	MC	-	-	-	P/F
Total				18	1	9	24.5
Total Credits: 24.5							

SEMESTER VIII

S.No.	Course Code	Course Title	Course Category	L	T	P	C
THEORY							
1.	PE - VI	Professional Elective – VI	PE	3	0	0	3
2.	OE - IV	Open Elective – IV	OE	3	0	0	3
PRACTICAL							
3.	21UBT801	Project work	P	0	0	16	8
MANDATORY							
4.	21UGM831	Professional Ethics and Human Values (Common to ALL)	MC	2	0	0	P/F
Total				8	0	16	14
Total Credits: 14							

LIST OF PROFESSIONAL ELECTIVES FOR HONORS DEGREE

S.No.	Course Code	Course Title	L	T	P	C
Vertical - I: 21BTV100 BIOPROCESS TECHNOLOGY						
1.	21BTV101	Environmental Biotechnology	3	0	0	3
2.	21BTV102	Bioprocess Modeling	3	0	0	3
3.	21BTV103	Biopharmaceutical Technology	3	0	0	3
4.	21BTV104	Bioreactor Design and Scale up process	3	0	0	3
5.	21BTV105	Bio-refinery and Sustainable Technologies	3	0	0	3
6.	21BTV106	Metabolic Engineering	3	0	0	3
Vertical - II: 21BTV200 BIOSCIENCES						
1.	21BTV201	Genomics and Proteomics	3	0	0	3
2.	21BTV202	Fundamentals of Nanotechnology	3	0	0	3
3.	21BTV203	Marine Biotechnology	3	0	0	3
4.	21BTV204	Stem Cell technology	3	0	0	3
5.	21BTV205	Neurobiology and Cognitive Sciences	3	0	0	3
6.	21BTV206	Human Physiology	3	0	0	3
7.	21BTV207	Biosensors in Disease Management	3	0	0	3
Vertical - III: 21BTV300 MEDICAL BIOTECHNOLOGY						
1.	21BTV301	Cancer Biology	3	0	0	3
2.	21BTV302	Tissue Engineering	3	0	0	3
3.	21BTV303	Nanomedicine for Theranostics	3	0	0	3
4.	21BTV304	Molecular Pathogenesis	3	0	0	3
5.	21BTV305	Vaccine Technology	3	0	0	3
6.	21BTV306	Molecular Therapeutics & Diagnostics	3	0	0	3
7.	21BTV307	Drug Delivery: Principles and Engineering	3	0	0	3
8.	21BTV308	Introduction to Proteogenomics	3	0	0	3
Vertical - IV: 21BTV400 COMPUTATIONAL BIOTECHNOLOGY						
1.	21BTV401	Programming for Bioinformatics Applications	3	0	0	3
2.	21BTV402	Fundamentals of Algorithms for Bioinformatics	3	0	0	3
3.	21BTV403	Computer Aided Drug Design	3	0	0	3
4.	21BTV404	Metabolomics and Metabolic Engineering	3	0	0	3
5.	21BTV405	Molecular Modelling	3	0	0	3
6.	21BTV406	Data Mining and Machine Learning Techniques for Bioinformatics	3	0	0	3

Vertical - V: 21BTV500 AGRO BIOTECHNOLOGY

1.	21BTV501	Plant Anatomy	3	0	0	3
2.	21BTV502	Plant Biotechnology	3	0	0	3
3.	21BTV503	Plant molecular Farming	3	0	0	3
4.	21BTV504	Plant tissue culture	3	0	0	3
5.	21BTV505	Biotechnological approach in crop improvement	3	0	0	3
6.	21BTV506	Bio fertilizer production and Mushroom cultivation	3	0	0	3
7.	21BTV507	Therapeutic applications of phytochemicals	3	0	0	3

Vertical - VI: 21BTV600 ANIMAL BIOTECHNOLOGY

1.	21BTV601	Fundamentals of Animal Biotechnology	3	0	0	3
2.	21BTV602	Animal Health and Nutrition	3	0	0	3
3.	21BTV603	Animal Physiology & Metabolism	3	0	0	3
4.	21BTV604	Animal cell culture Technology	3	0	0	3
5.	21BTV605	Advances in Animal Biotechnology	3	0	0	3
6.	21BTV606	Tissue Engineering	3	0	0	3
7.	21BTV607	Dairy Technology	3	0	0	3

GENERAL VERTICALS FOR MINOR DEGREE

S. No.	Course Code	Course Title	L	T	P	C
Vertical – 21CBVG00 Fintech and Block Chain						
1.	21CBVG01	Financial Management	3	0	0	3
2.	21CBVG02	Fundamentals of Investment	3	0	0	3
3.	21CBVG03	Banking, Financial Services and Insurance	3	0	0	3
4.	21CBVG04	Introduction to Block chain and its applications	3	0	0	3
5.	21CBVG05	Fintech Personal Finance and Payments	3	0	0	3
6.	21CBVG06	Introduction to Fintech	3	0	0	3
Vertical – 21MEVG00 Entrepreneurship						
1.	21MEVG01	Foundations of Entrepreneurship	3	0	0	3
2.	21MEVG02	Team Building & Leadership Management for Business	3	0	0	3
3.	21MEVG03	Creativity & Innovation in Entrepreneurship	3	0	0	3
4.	21MEVG04	Principles of Marketing Management for Business	3	0	0	3
5.	21MEVG05	Human Resource Management for Entrepreneurs	3	0	0	3
6.	21MEVG06	Financing New Business Ventures	3	0	0	3
Vertical – 21EEVG00 Public Administration						
1.	21EEVG01	Principles of Public Administration	3	0	0	3
2.	21EEVG02	Constitution of India	3	0	0	3
3.	21EEVG03	Public Personnel Administration	3	0	0	3
4.	21EEVG04	Administrative Theories	3	0	0	3
5.	21EEVG05	Indian Administrative System	3	0	0	3
6.	21EEVG06	Public Policy Administration	3	0	0	3
Vertical – 21CSVG00 Business Data Analytics						
1.	21CSVG01	Statistics for Management	3	0	0	3
2.	21CSVG02	Data mining for Business Intelligence	3	0	0	3
3.	21CSVG03	Human Resource Analytics	3	0	0	3
4.	21CSVG04	Marketing and Social Media Web Analytics	3	0	0	3
5.	21CSVG05	Operation and Supply Chain Analytics	3	0	0	3
6.	21CSVG06	Financial Analytics	3	0	0	3
Vertical – 21CEVG00 Environment and Sustainability						
1.	21CEVG01	Sustainable infrastructure Development	3	0	0	3
2.	21CEVG02	Sustainable Agriculture and Environmental Management	2	0	2	3
3.	21CEVG03	Sustainable Bio Materials	3	0	0	3
4.	21CEVG04	Materials for Energy Sustainability	3	0	0	3
5.	21CEVG05	Green Technology	3	0	0	3
6.	21CEVG06	Environmental Quality Monitoring and Analysis	3	0	0	3
7.	21CEVG07	Integrated Energy Planning for Sustainable Development	3	0	0	3
8.	21CEVG08	Energy Efficiency for Sustainable Development	3	0	0	3

LIST OF OPEN ELECTIVES

S. No.	Course Code	Course Title	L	T	P	C
Open Electives - I						
1.	21UCS971	Artificial Intelligence and machine Learning Fundamentals	3	0	0	3
2.	21UCD972	Data Science Fundamentals	3	0	0	3
3.	21UEN971	English For Competitive Exam	3	0	0	3
4.	21UGR974	German for Engineers	3	0	0	3
Open Electives - II						
1.	21UEC976	IoT Concepts and Applications	3	0	0	3
2.	21UAD971	Augmented and Virtual Reality	3	0	0	3
3.	21UJN975	Japanese for Engineers	3	0	0	3
4.	21UEN972	Speak Better, Write Better	3	0	0	3
5.	21UFR973	French for Engineers	3	0	0	3
Open Electives - III						
1.	21UCB971	Digital Marketing Strategy	3	0	0	3
2.	21UCB973	Strategic Management and Leadership	3	0	0	3
3.	21UCS977	Mobile Application Development	3	0	0	3
4.	21UEC971	Automotive Electronics	3	0	0	3
5.	21UME976	Lean Concepts, Tools and Practices	3	0	0	3
6.	21UBM975	Robotics in Health Care	3	0	0	3
Open Electives - IV						
1.	21UBM974	Forensic Science	3	0	0	3
2.	21UCH971	Fire safety Engineering	3	0	0	3
3.	21UAD974	Working with Emotional Intelligence	3	0	0	3
4.	21UCD973	Digital Media and Society	3	0	0	3
5.	21UCS980	Web Technologies and Applications	3	0	0	3
6.	21UIT975	Introduction to 3D Animation	3	0	0	3
7.	21UME981	Quality Engineering	3	0	0	3

LIST OF INDUSTRY DESIGNED COURSES / VALUE ADDED COURSE

S.No.	Course Code	Course Title	L	T	P	C
1.	21UBT861	Mushroom Farming	0	0	2	1
2.	21UBT862	Food microbiology and Fermentation laboratory	0	0	2	1
3.	21UBT863	Automated Interactive Tools for Conformational Studies	0	0	2	1
4.	21UBT864	Introduction to Statistical Analysis System	1	0	0	1
5.	21UBT865	Computational Reckoning of Bioprocess	1	0	0	1
6.	21UBT866	Animal Cell Culture	1	0	0	1
7.	21UBT867	Introduction to PERL Programming & Bio-Perl	0	0	2	1
8.	21UBT868	Regulation Perspective of Clinical Research	1	0	0	1
9.	21UBT869	Numerical methods for Biotechnologists	1	0	0	1
10.	21UBT870	Biosafety Regulations	1	0	0	1
11.	21UBT871	Introduction to Fuzzy Logic and Genetic Algorithms	1	0	0	1
12.	21VBT01	Single Cell Protein Cultivation Strategies	Value Added Course			
13.	21VBT02	Synthesis of Nanoparticles & Characterization	Value Added Course			
14.	21VBT03	Statistical Tools for Biotechnologists	Value Added Course			
15.	21VBT04	Current Good Manufacturing Practices	Value Added Course			
16.	21VBT05	Industrial Training in Bioprocess Engineering	Value Added Course			
17.	21VBT06	Drug Discovery and Development	Value Added Course			
18.	21VBT07	Psychology	Value Added Course			

**LIST OF OPEN ELECTIVES
(OFFERED FOR OTHER BRANCH STUDENTS)**

S.No.	Course Code	Course Title	Course Category	L	T	P	C
1.	21UBT971	Bio nanotechnology	OE	3	0	0	3
2.	21UBT972	Herbal Medicines	OE	3	0	0	3
3.	21UBT973	Nano medicine for Cancer Treatment	OE	3	0	0	3
4.	21UBT974	Patents and Copyrights	OE	3	0	0	3
5.	21UBT975	Quality Assurance and Control in Food Industry	OE	3	0	0	3
6.	21UBT976	Bioentrepreneurship	OE	3	0	0	3
7.	21UBT977	Food and Dairy Technology	OE	3	0	0	3