BTECH BIOTECHNOLOGY

COURSE STRUCTURE

EFFECTIVE: 2024-25 ADMISSION BATCH

Approved in Academic Council held on 30 July 2025

BTECH BIOTECHNOLOGY

PROGRAM OBJECTIVES

PO1: Engineering Knowledge: Apply knowledge of mathematics, natural science, computing, engineering fundamentals and an engineering specialization as specified in WK1 to WK4 respectively to develop to the solution of complex engineering problems

PO2: Problem Analysis: Identify, formulate, review research literature and analyze complex engineering problems reaching substantiated conclusions with consideration for sustainable development. (WK1 to WK4)

PO3: Design/Development of Solutions: Design creative solutions for complex engineering problems and design/develop systems/components/processes to meet identified needs with consideration for the public health and safety, whole-life cost, net zero carbon, culture, society and environment as required. (WK5)

PO4: Conduct Investigations of Complex Problems: Conduct investigations of complex engineering problems using research-based knowledge including design of experiments, modelling, analysis & interpretation of data to provide valid conclusions. (WK8)

PO5: Engineering Tool Usage: Create, select and apply appropriate techniques, resources and modern engineering & IT tools, including prediction and modelling recognizing their limitations to solve complex engineering problems. (WK2 and WK6)

PO6: The Engineer and The World: Analyze and evaluate societal and environmental aspects while solving complex engineering problems for its impact on sustainability with reference to economy, health, safety, legal framework, culture and environment. (WK1, WK5, and WK7)

PO7: Ethics: Apply ethical principles and commit to professional ethics, human values, diversity and inclusion; adhere to national & international laws. (WK9)

PO8: Individual and Collaborative Team work: Function effectively as an individual, and as a member or leader in diverse/multi-disciplinary teams

PO9: Communication: Communicate effectively and inclusively within the engineering community and society at large, such as being able to comprehend and write effective reports and design documentation, make effective presentations considering cultural, language, and learning differences

PO10: Project Management and Finance: Apply knowledge and understanding of engineering management principles and economic decision-making and apply these to one's own work, as a member and leader in a team, and to manage projects and in multidisciplinary environments

PO11: Life-Long Learning: Recognize the need for, and have the preparation and ability for i) independent and life-long learning ii) adaptability to new and emerging technologies and iii) critical thinking in the broadest context of technological change. (WK8)

FIRST SEMESTER

S. No.	Course			Contact Hours				Credits
	Category	Course Code	Course Title	L	T	P	Total	
1	HSMC	21B11HS111	English	2	0	0	2	2
2	HSMC	21B17HS171	English Lab	0	0	2	2	1
3	BSC	18B11MA112	Mathematics for Life Sciences I **OR**	3	1	0	4	4
		18B11BT111	Fundamental Biology	3	0	0	3	3
		18B17BT171	Fundamental Biology Lab	0	0	2	2	1
4	BSC	18B11PH112	Basic Engineering Physics-I	3	1	0	4	4
5	ESC	24B11CI111	Problem Solving and Programming	3	0	0	3	3
6	BSC	18B17PH172	Basic Engineering Physics Lab-I	0	0	2	2	1
7	ESC	24B17CI171	Problem Solving and Programming Lab	0	0	2	2	1
8	ESC	18B17GE173	Engineering Graphics **OR**	0	0	3	3	1.5
9	ESC	18BI7GE171	Workshop Practices	0	0	3	3	
10	PR	24B19BT191	Project	0	0	2	2	1
11	MNC		Mandatory Induction Program (including UHV-1)	2 Weeks				
			TOTAL				**24/25**	**18.5**

SECOND SEMESTER

S. No.	Course			Contact Hours				Credits
	Category	Course Code	Course Title	L	T	P	Total	
1	HSMC	23B11HS211	UHV II: Understanding Harmony	2	1	0	3	3
2	HSMC	23B11HS212	Professional Communication Practice (AUDIT)	0	1	0	1	0
3	BSC	25B11MA212	Mathematics for Life Sciences II	3	1	0	4	4
4	BSC	18B11PH212	Bioinstrumentation Techniques	3	1	0	4	4
5	ESC	24B11EC212	Basic Electrical Engineering for Life Sciences	3	1	0	4	4
6	ESC	24B17EC272	Basic Electrical Engineering for Life Sciences Lab	0	0	2	2	1
7	ESC	24B11CI211	Data Structure & Algorithms	3	0	0	3	3
8	ESC	18B17CI271	Data Structure & Algorithms Lab	0	0	4	4	2
9	ESC	18BI7GE171	Workshop Practices **OR**	0	0	3	3	1.5
10	ESC	18B17GE173	Engineering Graphics	0	0	3	3	
11	PR	24B19BT291	Project	0	0	2	2	1
			TOTAL				**30**	**23.5**

 # Summer Training-I(4weeks)(In summer vacation after second semester

THIRD SEMESTER

S No	Course			Contact Hours				Credits
	Category	Course Code	Course Title	L	T	P	Total	
1.	BSC	25B11MA313	Probability and Statistical Techniques	3	1	0	4	4
2.	BSC	25B11BT313	Biochemistry	3	1	0	4	4
3.	PCC	25B11BT311	Thermodynamics and Chemical Processes	3	1	0	4	4
4.	PCC	25B11BT312	Genetics and Developmental Biology	3	1	0	4	4
5	PCC	25B17BT373	Biochemical Techniques Lab	0	0	2	2	1
6.	PCC	25B17BT371	Thermodynamics and Chemical Processes Lab	0	0	2	2	1
7.	PCC	25B17BT372	Genetics and Developmental Biology Lab	0	0	2	2	1
8.	PCC	25B11HS311	Economics	2	1	0	3	3
9.	HSC	25B19BT391	Summer Training-I(4 weeks)	0	0	0	0	2
10.	PRC	25B11GE311	Environmental Studies	3	0	0	3	Qualifying
	OMC	25B17CI379	Competitive Programming-I	0	0	2	2	1
			TOTAL				**30**	**25**

FOURTH SEMESTER

S No	Course			Contact Hours				Credits
	Category	Course Code	Course Title	L	T	P	Total	
1.	HSC		HSS Elective– 1	2	1	0	3	3
2.	PCC	25B11BT416	Molecular Biology	3	1	0	4	4
3.	PCC	25B11BT414	Introduction to Bioinformatics	3	1	0	4	4
4.	PCC	25B11BT412	Microbiology	3	1	0	4	4
5	PCC	25B11BT413	Immunology	3	0	0	3	3
6.	PCC	25B17BT472	Microbiology Lab	0	0	2	2	1
7.	PCC	25B17BT474	Bioinformatics Lab	0	0	2	2	1
8.	PCC	25B17BT473	Immunology Lab	0	0	2	2	1
9.	PEC		Discipline Elective-1*	3	0	0	3/4	3
			TOTAL				**27**	**24**

*Discipline electives may run in 3 0 0 or 2 02(LT P) mode as per requirement of subject

FIFTH SEMESTER

S No	Course			Contact Hours				Credits
	Category	Course Code	Course Title	L	T	P	Total	
1.	PCC		Genetic Engineering	3	1	0	4	4
2.	PCC		Bioprocess Engineering	3	1	0	4	4
3.	PCC		Genetic Engineering Lab	0	0	2	2	1
4.	PCC		Industrial Biotechnology Lab	0	0	2	2	1
5	PEC		Discipline Elective–2*	3/2	0	0/2	3/4	3
6.	PEC		Discipline Elective–3*	3/2	0	0/2	3/4	3
7.	BSC		Science Elective	3		0	3	3
8.	OMC		Indian Constitution & Traditional Knowledge	3	0	0	3	Qualifying
9.	PRC		Summer Training-II (6weeks)	0	0	0	0	2
10.			LQT-I	2	0	0	2	2
			TOTAL				**26**	**23**

SIXTH SEMESTER

S No	Course			Contact Hours				Credits
	Category	Course Code	Course Title	L	T	P	Total	
1.	PCC		Biocomputing and Applications	3	0	0	3	3
2.	PCC		Cell Culture Technology	3	0	0	3	3
3.	PCC		Food and Agribiotechnology	3	0	0	3	3
4.	PEC		Discipline Elective– 4*	3/2	0	0/2	3/4	3
5	PEC		Discipline Elective-5*	3/2	0	0/2	3/4	3
6.	OEC		Open Elective-1	2	0	0	2	2
7.	Value added		Selected Value-Added Course	2	0	0	2	Audit
8.	PCC		IT Practice Lab	0	0	2	2	1
9.	PCC		Cell Culture Lab	0	0	2	2	1
10.	HSC		Soft Skill For Employability	0	0	2	2	1
11.	PRC		Minor Project	0	0	4	4	2
12.			LQT-II	2	0	0	2	2
			TOTAL				**31**	**24**

SEVENTH SEMESTER

S No	Course			Contact Hours				Credits
	Category	Course Code	Course Title	L	T	P	Total	
1.	PEC		Discipline Elective–6*	3/2	0	0/2	3/4	3
2.	OEC		Open Elective-2	3	0	0	3	3
3.	PRC		Major Project Part-1	0	0	0	8	4
4.	PRC		Summer Training-III (6 weeks)	0	0	0	0	4
			TOTAL				**14**	**14**

EIGHTH SEMESTER

S No	Course			Contact Hours				Credits
	Category	Course Code	Course Title	L	T	P	Total	
1.	PEC		Discipline Elective–7*	3/2	0	0/2	3/4	3
2.	OEC		Open Elective-3	3	0	0	3	3
3.	PRC		Major Project Part-2	0	0	0	16	8
			TOTAL				**22**	**14**

Total Program Credits: 18.5+23.5+25+24+23+24+14+14 = 166