BTECH BIOINFORMATICS

COURSE STRUCTURE

EFFECTIVE: 2025-26 ADMISSION BATCH

Approved in Academic Council held on 30 July 2025

BTECH BIOINFORMATICS

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

Sr. No.	Course			Contact Hours				Credits
	Category	Course Code	Course Title	L	T	P	Total	
1.	BSC	25B11MA112	Mathematics for Life Sciences-I	3	1	0	4	4
2.	BSC	25B11PH112	Basic Engineering Physics	3	1	0	4	4
3.	ESC	25B11CI112	Software Development Fundamentals-I	3	1	0	4	4
4.	HSC	25B11HS111	English	1	0	2	3	2
5.	BSC	25B17PH171	Physics Lab-1	0	0	2	2	1
6.	ESC	25B17CI172	Software Development Fundamentals Lab-I	0	0	2	2	1
7.	ESC	25B17GE171	Workshop	0	0	3	3	1.5
8.	ESC	25B17GE172	Engineering Drawing & Design	0	0	3	3	
9.	ESC	25B11EC112	Basic Electronics for Life Sciences	3	1	0	4	4
10.	ESC	25B17EC172	Basic Electronics for Life Sciences Lab	0	0	2	2	1
Total							**28**	**22.5**

SECOND SEMESTER

Sr. No.	Course			Contact Hours				Credits
	Category	Course Code	Course Title	L	T	P	Total	
1.	BSC	25B11MA212	Mathematics for Life Sciences-II	3	1	0	4	4
2.	BSC	25B11PH212	Biophysical Techniques	3	1	0	4	4
3	ESC	25B11CI21	Software Development Fundamentals-II	3	1	0	4	4
4.	BSC	25B17BT271	Basic Bioscience Lab	0	0	2	2	1
5.	ESC	25B17CI271	Software Development Fundamentals Lab-II	0	0	2	2	1
6.	HSC	25B17HS271	Life Skills & Professional Communication Lab	0	0	2	2	Qualifying
7.	ESC	25B17GE172	Engineering Drawing & Design	0	0	3	3	1.5
8.	ESC	25B17GE171	Workshop	0	0	3	3	
9.	HSC	25B11HS211	Universal Human Values (UHV)	2	1	0	3	3
Total							**24**	**18.5**

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	PCC	25B11BI311	Biological Computation	3	0	0	3	3
3	PCC		Data Structures	3	1	0	4	4
4	PCC		Data Structures Lab	0	0	2	2	1
5	PCC	25B11BI312	Bioinformatics Data management	3	0	0	3	3
6	PCC	25B17BI372	Bioinformatics Data Management Lab	0	0	2	2	1
7	PCC	25B17BI371	Biological computation Lab	0	0	2	2	1
8	PCC	25B11BT313	Biochemistry	3	1	0	4	4
9	HSC	25B11HS311	Economics	2	1	0	3	3
10	PRC	25B19BI391	Summer Training-I (4 weeks)	0	0	0	0	2
11			Competitive Programming-I	0	0	2	2	1
Total							**30**	**27**

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	25B11BT411	Python for Bioinformatics	3	0	0	3	3
3	PCC	25B17BT471	Python for Bioinformatics Lab	0	0	2	2	1
4	PCC	25B11CI412	Design and Analysis of Algorithms	3	1	0	4	4
5	PCC	25B17CI472	Design and Analysis of Algorithms Lab	0	0	2	2	1
6	PCC	25B11CI413	Artificial Intelligence and Machine Learning	3	0	0	3	3
7	PCC	25B17CI473	Artificial Intelligence and Machine Learning Lab	0	0	2	2	1
8	PCC	25B11BT415	Molecular Biology	3	0	0	3	3
9	PEC		Discipline Elective – 1	3/2	0	0/2	3/4	3
10	OMC	25B11GE411	Environmental Studies	3	0	0	3	Qualifying
Total							**28**	**22**

FIFTH SEMESTER

S.	Course	Contact Hours	Credits

No.	Category	Course Code	Course Title	L	T	P	Total	
	PCC		Web Development for Bioinformatics	3	0	0	3	3
	PCC		Web Development for Bioinformatics Lab	0	0	2	2	1
1	PCC		Linux Lab	0	0	2	2	1
2	PCC		Structural Bioinformatics	3	1	0	4	4
3	PCC		Structural Bioinformatics Lab	0	0	2	2	1
4	PCC		R Language 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	0	3	3
8	OMC		Indian Constitution & Traditional Knowledge	3	0	0	3	Qualifying
9	PRC		Summer Training-II (6 weeks)	0	0	0	0	2
10		24B11HS513	LQT-I	2	0	0	2	2
Total							**29**	**24**

SIXTH SEMESTER

S. No.	Course			Contact Hours				Credits
	Category	Course Code	Course Title	L	T	P	Total	
1	PCC		Advanced Algorithms for Bioinformatics	3	0	0	3	3
3	PCC		Computer Aided Drug Design	3	1	0	4	4
4	PCC		Computer Aided Drug Design Lab	0	0	2	2	1
5	PCC		Advanced Algorithms for Bioinformatics Lab	0	0	2	2	1
6	PCC		NGS Data Analysis Lab	0	0	2	2	1
7	PEC		Discipline Elective – 4	3/2	0	0/2	3/4	3
8	PEC		Discipline Elective – 5	3/2	0	0/2	3/4	3
9	OEC		Open Elective – 1	2	0	0	2	2
10	Value Added		Selected Value Added Course	2	0	0	2	Audit
11	HSC		Soft Skill For Employability	0	0	2	2	1
12	PRC		Minor Project	0	0	4	4	2
			LQT-II	2	0	0	2	2
Total							**31**	**23**

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: 22.5+18.5+27+22+24+23+14+14 = 165