

## Department of Biotechnology

### B.Tech. Biotechnology & Bioinformatics Curriculum

Course No	SEM - I	Type	Credits
CY1018	Environmental Chemistry	BS	2
EP1108	Modern Physics	BS	2
ID1063	Introduction to Programming	BE	3
MA1110	Calculus-I	BS	1
MA1220	Calculus-II	BS	1
BT1023	Basic Bioinformatics	DC	2
LA1760	English Communication*	LA	2
LAXxxx	LA Elective	LA	1
BT1110	Introduction to bio-nanotechnology	DC	1
BT1010	Introduction to Life Sciences*	BS	1
	TOTAL		16

Course No	SEM - 2	Type	Credits
MA1140	Elementary Linear Algebra	BS	1
MA1150	Differential Equations	BS	1
ID1050	Intro to AI & ML	BE	1
CH1140	Thermodynamics	BE	3
EP1031	Physics lab	BS	2
FExxxx	Free Elective	FE	1
BM1030	Bioengineering	BE	2
CY1031	Chemistry Lab	BS	2
ID1054	Digital Fabrication	BE	2
	TOTAL		15

Course No	SEM - 3	Type	Credits
BT2030	Biochemistry	DC	3
BT2040	Microbiology	DC	2
BT2011	Basic Biotechnology lab	DC	3
BT2053	Big Data biology & Biological databases	DC	3
ID2230	Data Structures and Applications	BE	3
BT3123	R and Python for Biologists	DC	3
	TOTAL		17

Course No	SEM - 4	Type	Credits
BT2063	Molecular and Cellular Biology	DC	3
BT2070	Biochemical Engineering	DC	3
BT2090	Protein structure, function and disease	DC	3
BTxxxx	Elective (BT)	DE	3
BT2083	Next Generation Sequencing	DC	2
BT2023	Biostatistics	DC	3
	TOTAL		17

Course No	SEM - 5	Type	Credits
BT4130	Neuroscience & Technology	DC	3
FExxxx	Free Elective	FE	2
BT3030	Sequence alignment algorithms	DC	2
BT3023	Machine Learning for Bioinformatics	DC	2
BT3043	Genetic Engineering	DC	3
BT3050	Genomics, Transcriptomics & Proteomics	DC	3
LAxxxx	LA Electives	LA	2
	TOTAL		17

Course No	SEM – 6	Type	Credits
FExxxx	Free Electives	FE	6
LAxxxx	LA Electives	LA	3
BT3015	Option 1: Internship (CGPA > 7.0)		6
BT3015	Option 2: Departmental Project	DE	6
	TOTAL		15

Course No	SEM - 7	Type	Credits
BT4030	Industrial Biotechnology	DC	3
BT4040	Immunology and Immunotechnology	DC	2
BTxxxx	Elective	DE	2
BT4026	Seminar in BT and BI	DC	1
BT4010	Computer Aided Drug Designing	DC	3
BT4223	Algorithms for Molecular Dynamics simulation	DC	2
FExxxx	Free Elective	FE	2
	TOTAL		15

Course No	SEM - 8	Type	Credits
FExxxx	Free Electives	FE	2
LAxxxx	LA Elective	LA	2
BTxxxx	Elective	DE	3
BTxxxx	Elective	DE	2
BT5010	Systems Biology	DC	2
ID4006	Ethics and values*	LA	1
BT4143	Biological Data Analysis	DC	3
	TOTAL		15

**Total Number of Credits: 127**

Core/Elective: 76 (59%)

Basic science: 13 (10%)

Basic engineering: 14 (11%)

LA/Creative arts: 11 (8%)

Free electives: 13 (10%)

\* 1-credit mandatory course

Departmental elective courses

S. No.	Semester	Code	Course Name	Credits
1	4	BT2253	Molecular Biophysics and Macromolecular Structural Biology	3
2	4	BT2150	Nucleic acids and RNA biomedicine	3
3	7	BT4150	Genomics stability and Human Disease	2
4	8	BT5020	BioSignalling	3
8	8	BT4050	Principles of Pharmacology	2
9	8	BT4160	Fermentation Technology	2