CURRICULUM - B. Tech. Computational Biology (2023-27)

Semester 1						
Sr. No.	**Code**	**Course**	**L**	**T**	**P**	**Credits**
1	BT 1101/ BT 1102	Basic Mathematics I / Introduction to Biology*	3	0	0	3
2	CS 1101	Introduction to Computing	2	1	2	4
1	BT 1104	Chemistry of Biomolecules	3	0	2	4
5	PH 1103	Physics for BT & CB	3	1	2	5
6	ES 103	Earth and Environmental Sciences	2	0	0	2
7	HS 1101	English	0	3	0	3
8	HS 1102	Media Project	0	0	2	1.5
9	FS 1103	French- I	0	2	0	0.5
10	HS 1104	Introduction to Entrepreneurship	0	0	3	1
		Total Credits				**24**

***For students with Bio or Math in 10+2**

Semester 2						
	Code	**Course**	**L**	**T**	**P**	**Credits**
2	BT 1205	Genetics	2	1	2	4
3	BT 1207	Basic Mathematics II	3	1	0	4
5	CB1201	Introduction to Computational Biology	1	0	0	1
6	CS 1202	Discrete Mathematics	2	0	0	2
	EE1204	Basic Electronics & Applications	2	1	2	4
4	CH 1202	Chemistry-II	2	0	2	3
7	CB 1202	Programming Workshop (C++)	0	0	2	1
8	HS 1201	Entrepreneurship Practice	1	0	0	1
9	HS 1202	Professional Ethics	0	1	0	1
10	FL 1203	French-II	0	2	0	0.5
		Total Credits				**21.5**

Semester 3						
	Code	**Course**	**L**	**T**	**P**	**Credits**
1	BT 2109	Microbes & Immune Systems	3	0	2	4
2	BT 2110	Cell & Molecular Biology	3	0	2	4
3	BT 2111	Probability & Biostatistics	2	1	2	4
4	CS2104	Data Structures	2	2	2	5
5	HS 2 101	Lean Start-up (Fractal)	1	0	0	1
6	HS 2102	Principles of Economics (Fractal)	3	0	0	1.5
7	HS 2103	French-III	0	2	0	0.5
8	CB 2103	Programming Workshop (Python & BioPython)	0	0	2	1
		Total Credits				**21**

Semester 4						
	Code	**Course**	**L**	**T**	**P**	**Credits**
1	CB 2204	Computational Biology	3	0	2	4
2	BT 2212	Omic Technologies	3	0	2	4
3	CB 2205	Structural Bioinformatics	2	0	2	3
4	CS 2203	Artificial and Computational Intelligence	4	0	0	4
5	BT 2215	IPR & Regulatory	1	0	0	1
6	HS 2201	Design Thinking	1	0	2	2
7	HS 2202	Financial Accounting	3	0	0	1.5
8	HS 2203	French-IV	0	2	0	0.5
9	CB 2206	Programming Workshop with R	0	0	2	1
		Total Credits				**21**

Semester 5						
	Code	**Course**	**L**	**T**	**P**	**Credits**
1	CS 3101	Design and Analysis of Algorithms	3	0	2	4
2	CB 3106	Biological Database Management	3	0	2	4
3	CS 3105	Object Oriented Programming	2	0	2	3
	CB 3107	Workshop in Linux	0	0	2	1
5	CB 3008	Elective – I	3	0	0	3
6	CB 3009	Elective – II	3	0	0	3
7	HS Electives	HSS Elective -I	2	0	0	2
		Total Credits				**20**

		Semester 6				
	Code	**Course**	**L**	**T**	**P**	**Credits**
1	CB 3210	Algorithms in Bioinformatics	1	0	2	2
2	CS 2202	Machine Learning with Python	3	0	2	4
3	CB 3211	Programming Workshop (Java & BioJava)	0	0	2	1
	CB 3212	Computational Genomics	3	0	2	4
5	CB 3013	Elective – III	3	0	0	3
6	CB 3014	Elective – IV	3	0	0	3
7	PR 301	Project-I (Literature review & seminar)	0	0	5	2.5
8	HS Electives	HSS Elective-II	2	0	0	2
9	HS 3201	Introduction to Professional Development (Fractal)	2	0	0	2
		Total Credits				**23.5**

		Semester 7				

	Code	Course	L	T	P	Credits
2	BT 4227	Research Methods & Ethics	2	0	0	2
	CB 4115	Systems Biology in Drug Discovery & Development	2	0	2	3
2	CB 4016	Elective – V	3	0	0	3
3	CB 4017	Elective – VI	3	0	0	3
4	PR 402	Project-II (Research work and presentation)	0	0	10	5
5	HSS Elective	HSS Elective-III	2	0	0	2
		Total Credits				**18**

		Semester 8				
	Code	**Course**	**L**	**T**	**P**	**Credits**
1	PR 403	Year-4 Project (Industrial Internship/R&D Institute with major research project)	0	0	24	12
		Total Credits				**12.0**

Total Credits: 24 + 21.5 + 21 + 21 + 20 + 23.5 + 18 + 12 = 161

Electives: Students will choose 4 electives from a particular track (specialization) and remaining 2 electives from any BT or CB baskets

Specializations: Each specialization will have 4 electives and extensive project work

Projects-I, II, III: For students choosing a particular track, all 3 projects will be aligned to track/ specialization