Program Code : 111 - B.Tech. (Biotechnology)
Department : Department of Biotechnology
Year : I

Teaching Scheme					Contact Hours/Week			Exam Duration		Relative Weight (%)				
S. No.	Subject Code	Course Title	Subject Area	Credit	L	T	P	Theory	Practical	CWS	PRS	MTE	ETE	PRE
FIRST YEAR (Autumn)														
1.	MAN-001	Mathematics-I	BSC	4	3	1	0	3	0	20-35	-	20-30	40-50	-
2.	PHN-007	Modern Physics	BSC	4	3	0	2	3	0	10-25	25	15-25	30-40	
3.	CEN-105	Introduction to Environmental Studies	GSC	3	3	0	0	3	0	20-35	-	20-30	40-50	-
4.	HSN-001A	Communication Skills (Basic)	HSSC	2	1	0	2	2	0	25	-	25	50	-
	HSN-001B	Communication Skills (Advance)	HSSC	2	1	0	2	2	0	25	-	25	50	-
5.	HSN-002	Introduction of Psychology	HSSC	2	1	1	0	2	0	20-30	-	20-30	40-50	-
6.	BT-101	Introduction to Biotechnology	PCC	2	2	0	0	2	0	-	-	-	100	-
7.	BT-103	Computer Programming	ESC	4	3	0	2	3	0	10-25	25	15-25	30-40	-
		Total		**21**										
FIRST YEAR (Spring)														
1.	MAN-006	Probability and Statistics	BSC	4	3	1	0	3	0	20-35	-	20-30	40-50	-
2.	BT-102	Biochemistry	PCC	4	3	-	2	3	0	10-25	25	15-25	30-40	-
3.	BT-104	Cell Biology	PCC	4	3	-	2	3	0	10-25	25	15-25	30-40	-
4.	BT-106	Microbiology	PCC	4	3	-	2	3	0	10-25	25	15-25	30-40	-
5.	CYN- 002	Organic and Inorganic Chemistry	BSC	4	3	1	2/2	3	0	15-30	20	15-25	30-40	-
6.	CEN-108	Fluid Mechanics	ESC	4	3	1	2/2	3	0	15-30	20	15-25	30-40	-
		Total		**24**										

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Program Code: 111 - B.Tech. (Biotechnology)
Department : Department of Biotechnology
Year : II

Teaching Scheme					Contact Hours/Week			Exam Duration		Relative Weight (%)				
S. No.	Subject Code	Course Title	Subject Area	Credit	L	T	P	Theory	Practical	CWS	PRS	MTE	ETE	PRE
SECOND YEAR (Autumn)														
1.	MIN-106	Engineering Thermodynamics	ESC	4	3	1	2/2	3	0	15-30	20	15-25	30-40	-
2.	BT-201	Genetics and Developmental Biology	PCC	4	3	-	2	3	0	10-25	25	15-25	30-40	-
3.	BT-203	Immunology	PCC	4	3	-	2	3	0	10-25	25	15-25	30-40	-
4.	BT-205	Bioinformatics	PCC	4	3	-	2	3	0	10-25	25	15-25	30-40	-
5.	BT-207	Process Calculations	PCC	4	3	1	0	3	0	20-35	-	20-30	40-50	-
6.	HSN-ELE	HSS Elective Course	HSSMEC	3	2	1	0	3	0	20-35	-	20-30	40-50	-
Total				**23**										
SECOND YEAR (Spring)														
1.	BT-202	Structural Biology	PCC	4	3	-	2	3	0	10-25	25	15-25	30-40	-
2.	BT-204	Physiology of Animals and Plants	PCC	4	3	1	0	3	0	20-35	-	20-30	40-50	-
3.	BT-206	Transport phenomenon in Biological System	PCC	4	3	1	0	3	0	20-35	-	20-30	40-50	-
4.	BT-208	Biomaterials and Devices	PCC	4	3	1	2/2	3	0	15-30	20	15-25	30-40	-
5.	BT-210	Molecular Biology and Genetic Engineering	PCC	4	3	-	2	3	0	10-25	25	15-25	30-40	-
6.	ECN-102	Fundamentals of Electronics	ESC	4	3	1	0	3	0	20-35	-	20-30	40-50	-
		Total		**24**										

Program Code : 111 - B.Tech. (Biotechnology)
Department : Department of Biotechnology
Year : III

S. No.	Subject Code	Course Title	Subject Area	Credit	Contact Hours/Week			Exam Duration		Relative Weight (%)				
					L	T	P	Theory	Practical	CWS	PRS	MTE	ETE	PRE
THIRD YEAR (Autumn)														
1.	BT-301	Bioprocess Engineering	PCC	4	3	1	2/2	3	0	15-30	20	15-25	30-40	-
2.	BT-303	Animal and Plant Tissue Culture	PCC	4	3	-	2	3	0	10-25	25	15-25	30-40	-
3.	BT-305	Computational Biology	PCC	4	3	-	2	3	0	10-25	25	15-25	30-40	-
4.	BT-ELE1	Department Elective Course - I	PEC	4	3	1	-	3	0	20-35	-	20-30	40-50	-
5.	OEC/BM-ELE	Management Studies/ Open Elective Course*	HSSMEC/ OEC	3	3	0	0	3	0	20-35	-	20-30	40-50	-
6.	BT-391	Technical Communication	PCC	2	0	2	0	0	0	-	-	-	100	-
			Total	**21**										
THIRD YEAR (Spring)														
1.	BT-300	Case Study	PCC	4	3	1	0	3	0	20-35	-	20-30	40-50	-
2.	BT-302	Genomics, Proteomics and Metabolomics	PCC	4	3	1	2/2	3	0	15-30	20	15-25	30-40	-
3.	BT-304	Molecular Diagnostics	PCC	4	3	1	2/2	3	0	15-30	20	15-25	30-40	-
4.	BT-ELE2	Department Elective Course - II	PEC	4	3	1	0	3	0	20-35	-	20-30	40-50	-
5.	MSC1/ DHC1	Minor Specialization Course-I / Departmental Honours Course-I	MSC/DHC	4	3	1	0	3	0	20-35	-	20-30	40-50	-
6.	OEC/BM-ELE	Management Studies/ Open Elective Course*	HSSMEC/ OEC	3	3	0	0	3	0	20-35	-	20-30	40-50	-
7.	BT-399	Educational Tour	PCC	0	0	0	0	0	0	-	-	-	-	-
			Total	**19-23**										

* One course each from the OEC and the HSSMEC categories is to be opted either in the Autumn or in the Spring semester in the third year. The HSSMEC course should be selected from the list (basket) of Management Studies Elective Course.

Program Code : 111 - B.Tech. (Biotechnology)
Department : Department of Biotechnology
Year : IV

Teaching Scheme					Contact Hours/Week			Exam Duration		Relative Weight (%)				
S. No.	Subject Code	Course Title	Subject Area	Credit	L	T	P	Theory	Practical	CWS	PRS	MTE	ETE	PRE
FOURTH YEAR (Autumn)														
1.	BT-400A	B.Tech. Project	PCC	4	0	0	8	0	0	-	-	-	-	-
2.	BT- ELE3	Department Elective Course -III	PEC	4	3	1	0	3	0	20-35	-	20-30	40-50	-
3.	BT- ELE4	Department Elective Course -IV	PEC	4	3	1	0	3	0	20-35	-	20-30	40-50	-
4.	MSC2/ DHC2	Minor Specialization Course-II Departmental Honours Course-II	MSC/DHC	4	3	1	0	3	0	20-35	-	20-30	40-50	-
5.	MSC3/ DHC3	Minor Specialization Course-III Departmental Honours Course-III	MSC/DHC	4	3	1	0	3	0	20-35	-	20-30	40-50	-
6.	BT-499	Training Seminar	PCC	2	0	2	0	0	0	100	-	-	-	-
		Total		**14-22**										
FOURTH YEAR (Spring)														
1.	BT-400B	B.Tech. Project	PCC	8	0	0	16	0	0	-	100	-	-	-
2.	BT-ELE5	Department Elective Course –V	PEC	4	3	1	0	3	0	20-35	-	20-30	40-50	-
3.	BT-ELE6	Department Elective Course -VI	PEC	4	3	1	0	3	0	20-35	-	20-30	40-50	-
4.	MSC4/ DHC4	Minor Specialization Course-IV / Departmental Honours Course-IV	MSC/DHC	4	3	1	0	3	0	20-35	-	20-30	40-50	-
5.	MSC5/ DHC5	Minor Specialization Course-V / Departmental Honours Course-V	MSC/DHC	4	3	1	0	3	0	20-35	-	20-30	40-50	-
		Total		**16-24**										

List of Department Minor Specialization Courses:

Teaching Scheme					Contact Hours/Week			Exam Duration		Relative Weight (%)				
S. No.	Subject Code	Course Title	Subject Area	Credit	L	T	P	Theory	Practical	CWS	PRS	MTE	ETE	PRE
1.	BT-490	Fundamentals of Biotechnology	MSC	4	3	1	0	3	0	20-35	-	20-30	40-50	-
2.	BT-491	Biophotonics	MSC	4	3	1	0	3	0	20-35	-	20-30	40-50	-
3.	BT-492	Introduction to Computational Biology	MSC	4	3	1	0	3	0	20-35	-	20-30	40-50	-
4.	BT-493	Recombinant DNA Technology	MSC	4	3	1	0	3	0	20-35	-	20-30	40-50	-
5.	BT-494	Environmental Biotechnology	MSC	4	3	1	0	3	0	20-35	-	20-30	40-50	-
6.	BT-495	Fermentation Technology	MSC	4	3	1	0	3	0	20-35	-	20-30	40-50	-
7.	BT-496	Fundamentals of Food Biotechnology	MSC	4	3	1	0	3	0	20-35	-	20-30	40-50	-
8.	BT-497	NMR Techniques	MSC	4	3	1	0	3	0	20-35	-	20-30	40-50	-

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List of Department Honours Specialization Courses:

Teaching Scheme					Contact Hours/Week			Exam Duration		Relative Weight (%)				
S. No.	Subject Code	Course Title	Subject Area	Credit	L	T	P	Theory	Practical	CWS	PRS	MTE	ETE	PRE
1.	BT-471	Drug Discovery and Development	DHC	4	3	1	0	3	0	20-35	-	20-30	40-50	-
2.	BT-472	Stem Cell Technology	DHC	4	3	1	0	3	0	20-35	-	20-30	40-50	-
3.	BT-473	Phytomedicine	DHC	4	3	1	0	3	0	20-35	-	20-30	40-50	-
4.	BT-474	Advanced Virology	DHC	4	3	1	0	3	0	20-35	-	20-30	40-50	-
5.	BT-475	Enzyme Technology	DHC	4	3	1	0	3	0	20-35	-	20-30	40-50	-
6.	BT-476	Protein Crystallography	DHC	4	3	1	0	3	0	20-35	-	20-30	40-50	-
7.	BT-477	Biomedical Optics and Biophotonics	DHC	4	3	1	0	3	0	20-35	-	20-30	40-50	-
8.	BT-478	Protein NMR	DHC	4	3	1	0	3	0	20-35	-	20-30	40-50	-

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List of Department Elective Course

Category-I

Teaching Scheme					Contact Hours/Week			Exam Duration		Relative Weight (%)				
S. No.	Subject Code	Course Title	Subject Area	Credit	L	T	P	Theory	Practical	CWS	PRS	MTE	ETE	PRE
Basket-1 (Cell and Molecular Biology)														
1.	BT-341	Gene Regulation	PEC	4	3	1	0	3	0	20-35	-	20-30	40-50	-
2.	BT-342	Food Biotechnology	PEC	4	3	1	0	3	0	20-35	-	20-30	40-50	-
3.	BT-343	Virology	PEC	4	3	1	0	3	0	20-35	-	20-30	40-50	-
4.	BT-344	Nano- Bioengineering	PEC	4	3	1	0	3	0	20-35	-	20-30	40-50	-
5.	BT- 345	Separation and Analysis of Biomolecules	PEC	4	3	1	0	3	0	20-35	-	20-30	40-50	-
6.	BT-346	Drug Discovery	PEC	4	3	1	0	3	0	20-35	-	20-30	40-50	-
Basket-2 (Biological Engineering)														
7.	BT-347	Bioprocess Control	PEC	4	3	1	0	3	0	20-35	-	20-30	40-50	-
8.	BT-348	Bioprocess Modelling and Simulation	PEC	4	3	1	0	3	0	20-35	-	20-30	40-50	-
9.	BT-349	Biomechanics	PEC	4	3	1	0	3	0	20-35	-	20-30	40-50	-
Basket-3 (Structural and Computational Biology)														
10.	BT-350	Machine Learning and Deep Learning	PEC	4	3	1	0	3	0	20-35	-	20-30	40-50	-
11.	BT-351	Protein Engineering	PEC	4	3	1	0	3	0	20-35	-	20-30	40-50	-
12.	BT-352	Biophotonics	PEC	4	3	1	0	3	0	20-35	-	20-30	40-50	-

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Category- II

Teaching Scheme					Contact Hours/Week			Exam Duration		Relative Weight (%)				
S. No.	Subject Code	Course Title	Subject Area	Credit	L	T	P	Theory	Practical	CWS	PRS	MTE	ETE	PRE
Basket-1 (Cell and Molecular Biology)														
1.	BT-441	Principles of Synthetic Biology	PEC	4	3	1	0	3	0	20-35	-	20-30	40-50	-
2.	BT-442	Environmental Biotechnology	PEC	4	3	1	0	3	0	20-35	-	20-30	40-50	-
3.	BT-443	Stem Cell Engineering	PEC	4	3	1	0	3	0	20-35	-	20-30	40-50	-
4.	BT-444	Industrial Bioprocessing	PEC	4	3	1	0	3	0	20-35	-	20-30	40-50	-
5.	BT-445	High Throughput Sequencing	PEC	4	3	1	0	3	0	20-35	-	20-30	40-50	-
6.	BT-446	Chemical Genetics	PEC	4	3	1	0	3	0	20-35	-	20-30	40-50	-
7.	BT-447	Genetically Modified Organisms	PEC	4	3	1	0	3	0	20-35	-	20-30	40-50	-
8.	BT-448	Vaccine Biotechnology	PEC	4	3	1	0	3	0	20-35	-	20-30	40-50	-
9.	BT-449	Cell and Tissue Engineering	PEC	4	3	1	0	3	0	20-35	-	20-30	40-50	-
Basket-2 (Biological Engineering)														
10.	BT-450	Bioreactor Design and Analysis	PEC	4	3	1	0	3	0	20-35	-	20-30	40-50	-
11.	BT-451	Bioprocess Optimization	PEC	4	3	1	0	3	0	20-35	-	20-30	40-50	-
12.	BT-452	Bioseparation Engineering	PEC	4	3	1	0	3	0	20-35	-	20-30	40-50	-
13.	BT-453	Bioelectronic Medical Devices	PEC	4	3	1	0	3	0	20-35	-	20-30	40-50	-

Basket-3 (Structural and Computational Biology)														
14.	BT-454	Big Data Analytics	PEC	4	3	1	0	3	0	20-35	-	20-30	40-50	-
15.	BT-455	Biomolecular NMR	PEC	4	3	1	0	3	0	20-35	-	20-30	40-50	-
16.	BT-456	Biomolecular Modelling	PEC	4	3	1	0	3	0	20-35	-	20-30	40-50	-
17.	BT-457	Systems Biology	PEC	4	3	1	0	3	0	20-35	-	20-30	40-50	-
18.	BT-458	Molecular Biophysics	PEC	4	3	1	0	3	0	20-35	-	20-30	40-50	-
19.	BT-459	Biomolecular Interactions	PEC	4	3	1	0	3	0	20-35	-	20-30	40-50	-
20.	BT-460	Design and Analysis of Algorithms	PEC	4	3	1	0	3	0	20-35	-	20-30	40-50	-