

Program Code : 111 - B.Tech. (Biotechnology)

Department : Department of Biotechnology

Year : I

Teaching Scheme					Contact Hours/Week			Exam Duration (Hrs.)		Relative Weights (%)				
S.No.	Subject Code	Course Title	Subject Area	Credit	L	T	P	Theory	Practical	CWS	PRS	MTE	ETE	PRE
<b>(Autumn)</b>														
1.	MA-001	Mathematics-I	BSC	4	3	1	0	3	0	25	-	25	50	-
2.	PH-107	Modern Physics	BSC	4	3	0	2	3	0	15	25	20	40	-
3.	CE-105	Introduction to Environmental Studies	GSC	3	3	0	0	3	0	25	-	25	50	-
4.	HS- 001A	Communication Skills (Basic)	HSSC	2	1	0	2	2	0	25	-	25	50	-
	HS- 001B	Communication Skills (Advance)												
5.	HS-002	Ethics and Self Awareness	HSSC	2	2	1	0	2	0	25	-	25	50	-
6.	BT-101	Introduction to Biotechnology	DCC	2	2	0	0	2	0	-	-	-	100	-
7.	BT-103	Computer Programming	ESC	4	3	0	2	3	0	15	25	20	40	-
<b>Total</b>				<b>21</b>	<b>17</b>	<b>2</b>	<b>6</b>							
<b>(Spring)</b>														
1.	MA- 002	Mathematical Methods	BSC	4	3	1	0	3	0	25	-	25	50	-
2.	BT-102	Process Calculations	DCC	4	3	1	0	3	0	25	-	25	50	-
3.	BT-104	Cell Biology	DCC	4	3	1	0	3	0	25	-	25	50	-
4.	BT-106	Biochemistry	DCC	4	3	1	0	3	0	25	-	25	50	-
5.	CY- 002	Organic and Inorganic Chemistry	BSC	4	3	0	2	3	2	15	25	20	40	-
6.	MI-102	Basic Manufacturing Processes	ESC	4	2	0	4	3	0	15	25	20	40	-
<b>Total</b>				<b>24</b>	<b>17</b>	<b>4</b>	<b>6</b>							

**Program Code** : 111 - B.Tech. (Biotechnology)

**Department** : Department of Biotechnology

**Year** : II

Teaching Scheme					Contact Hours/Week			Exam Duration (Hrs.)		Relative Weights (%)				
S.No.	Subject Code	Course Title	Subject Area	Credit	L	T	P	Theory	Practical	CWS	PRS	MTE	ETE	PRE
<b>(Autumn)</b>														
1.	MI-106	Engineering Thermodynamics	ESC	4	3	1	2/2	3	0	20	20	20	40	-
2.	BT-201	Genetics and Molecular Biology	DCC	4	3	1	0	3	0	25	-	25	50	-
3.	BT-203	Microbiology	DCC	4	3	1	0	3	0	25	-	25	50	-
4.	BT-205	Bioinformatics	DCC	4	3	1	0	3	0	25	-	25	50	-
5.	BT-207	Immunotechnology	DCC	4	3	1	0	3	0	25	-	25	50	-
6.	HS-ELE	HSS Elective Course*	HSSMEC	3	2	1	0	3	0	25	-	25	50	-
<b>Total</b>				<b>23</b>	<b>17</b>	<b>06</b>	<b>00</b>							
<b>(Spring)</b>														
1.	CE-142	Fluid Mechanics	ESC	4	3	1	2/2	3	0	20	20	20	40	-
2.	BT-202	Genetic Engineering	DCC	4	3	1	0	3	0	25	-	25	50	-
3.	BT-204	Structural Biology	DCC	4	3	1	0	3	0	25	-	25	50	-
4.	BT-206	Heat and Mass Transfer Operations	DCC	4	3	1	0	3	0	25	-	25	50	-
5.	BT-208	Biotechnology Laboratory - I	DCC	4	0	0	8	0	0	-	-	100	-	-
6.	BT-292	Chemical Kinetics and Reactor Design	DCC	3	2	1	0	2	0	25	-	25	50	-
<b>Total</b>				<b>23</b>	<b>14</b>	<b>05</b>	<b>08</b>							

Program Code : 111 - B.Tech. (Biotechnology)

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Year : III

Teaching Scheme					Contact Hours/Week			Exam Duration (Hrs.)		Relative Weights (%)				
S.No.	Subject Code	Course Title	Subject Area	Credit	L	T	P	Theory	Practical	CWS	PRS	MTE	ETE	PRE
<b>(Autumn)</b>														
1.	BT-301	Bioprocess Engineering	DCC	4	3	1	0	3	0	25	-	25	50	-
2.	BT-303	Plant Biotechnology	DCC	4	3	1	0	3	0	25	-	25	50	-
3.	BT-305	Animal Biotechnology	DCC	4	3	1	0	3	0	25	-	25	50	-
4.	BT-ELE1	Department Elective Course - I	DEC	4	3	1	0	3	0	25	-	25	50	-
5.	OEC/BM-ELE	Management Studies / Open Elective Course *	HSSMEC/OEC	3	3	0	0	3	0	25	-	25	50	-
6.	BT-391	Technical Communication	DCC	2	0	2	0	0	0	-	-	-	100	-
<b>Total</b>				<b>21</b>	<b>15</b>	<b>06</b>	<b>00</b>							
<b>(Spring)</b>														
1.	BT-300	Industry Oriental Problem /Case Study Lab Based Project/Practical Problem	DCC	4	3	1	0	3	0	25	-	25	50	-
2.	BT-302	Bioseparation Engineering	DCC	4	3	1	0	3	0	25	-	25	50	-
3.	BT-304	Biotechnology Laboratory - II	DCC	4	0	0	8	0	0	-	100	-	-	-
4.	BT-ELE2	Department Elective Course - II	DEC	4	3	1	0	3	0	25	-	25	50	-
5.	MSC1/DHC1	Minor Specialization Course-I Departmental Honours Course-I	MSC/DHC	4	3	1	0	3	0	25	-	25	50	-
6.	OEC/BM-ELE	Management Studies / Open Elective Course *	HSSMEC/OEC	3	3	0	0	3	0	25	-	25	50	-
7.	BT-399	Educational Tour	DCC	0	0	0	0	0	0	-	-	-	-	-
<b>Total</b>				<b>23</b>	<b>15</b>	<b>04</b>	<b>08</b>							

\*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)**

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**Year : IV**

Teaching Scheme					Contact Hours/Week			Exam Duration (Hrs.)		Relative Weights (%)				
S.No.	Subject Code	Course Title	Subject Area	Credit	L	T	P	Theory	Practical	CWS	PRS	MTE	ETE	PRE
<b>(Autumn)</b>														
1.	BT- 400A	B.Tech. Project	DCC	4	0	0	8	0	0	-	-	-	-	-
2.	BT- ELE3	Department Elective Course -III	DEC	4	3	1	0	3	0	25	-	25	50	-
3.	BT- ELE4	Department Elective Course -IV	DEC	4	3	1	0	3	0	25	-	25	50	-
4.	MSC2/DHC2	Minor Specialization Course-II Departmental Honours Course-II	MSC/ DHC	4	3	1	0	3	0	25	-	25	50	-
5.	MSC3/DHC3	Minor Specialization Course-III Departmental Honours Course-III	MSC/ DHC	4	3	1	0	3	0	25	-	25	50	-
6.	BT- 499	Training Seminar	DCC	2	0	2	0	0	0	100	-	-	-	-
<b>Total</b>				<b>14-22</b>	<b>12</b>	<b>06</b>	<b>08</b>							
<b>(Spring)</b>														
1.	BT- 400B	B.Tech. Project (Contd. from Autumn Semester)	DCC	8	0	0	16	0	0	-	100	-	-	-
2.	BT- ELE5	Department Elective Course -V	DEC	4	3	1	0	3	0	25	-	25	50	-
3.	BT- ELE6	Department Elective Course -VI	DEC	4	3	1	0	3	0	25	-	25	50	-
	MSC4/DHC4	Minor Specialization Course-IV Departmental Honours Course-IV	MSC/ DHC	4	3	1	0	3	0	25	-	25	50	-
4.	MSC5/DHC5	Minor Specialization Course-V Departmental Honours Course-V	MSC/ DHC	4	3	1	0	3	0	25	-	25	50	-
<b>Total</b>				<b>16-24</b>	<b>12</b>	<b>04</b>	<b>16</b>							

**DEPARTMENT OF BIOTECHNOLOGY  
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ROORKEE**

**List of Department Minor Specialization Courses:**

Teaching Scheme					Contact Hours/Week			Exam Duration (Hrs.)		Relative Weights (%)				
S. No.	Subject Code	Course Title	Subject Area	Credit	L	T	P	Theory	Practical	CWS	PRS	MTE	ETE	PRE
2.	BT- 491	<b>Introduction to Biophotonics tools and techniques</b>	MSC	4	3	1	0	3	0	25	-	25	50	-
3.	BT- 492	<b>Computational Biology</b>	MSC	4	3	1	0	3	0	25	-	25	50	-
4.	BT- 493	<b>Recombinant DNA Technology</b>	MSC	4	3	1	0	3	0	25	-	25	50	-
5.	BT- 494	<b>Environmental Biotechnology</b>	MSC	4	3	1	0	3	0	25	-	25	50	-
6.	BT- 495	<b>Fermentation Technology</b>	MSC	4	3	1	0	3	0	25	-	25	50	-
7.	BT- 496	<b>Fundamentals of Food Biotechnology</b>	MSC	4	3	1	0	3	0	25	-	25	50	-
8.	BT- 497	<b>NMR Techniques</b>	MSC	4	3	1	0	3	0	25	-	25	50	-

**DEPARTMENT OF BIOTECHNOLOGY  
INDIAN INSTITUTE OF TECHNOLOGY ROORKEE  
ROORKEE**

**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
2.	BT- 472	<b>Stem Cell Technology</b>	DHC	4	3	1	0	3	0	25	-	25	50	-
3.	BT- 473	<b>Chemical Genetics</b>	DHC	4	3	1	0	3	0	25	-	25	50	-
4.	BT- 474	<b>Phytomedicine</b>	DHC	4	3	1	0	3	0	25	-	25	50	-
5.	BT- 475	<b>Advanced Virology</b>	DHC	4	3	1	0	3	0	25	-	25	50	-
6.	BT- 476	<b>Biomolecular Interactions</b>	DHC	4	3	1	0	3	0	25	-	25	50	-
7.	BT- 477	<b>Drug Discovery</b>	DHC	4	3	1	0	3	0	25	-	25	50	-
8.	BT- 478	<b>Enzyme Technology</b>	DHC	4	3	1	0	3	0	25	-	25	50	-
9.	BT-479	<b>Protein Crystallography</b>	DHC	4	3	1	0	3	0	25	-	25	50	-
10.	BT-480	<b>Biomedical Optics and Biophotonics</b>	DHC	4	3	1	0	3	0	25	-	25	50	-
11.	BT-481	<b>Protein NMR</b>	DHC	4	3	1	0	3	0	25	-	25	50	-

Revised as on Oct. 24, 2013

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**List of Department Electives :**

S. No	Teaching Scheme				Contact Hours/Week			Exam Duration		Relative Weight (%)				
	Subject Code	Course Title	Subject Area	Credit	L	T	P	Theory	Practical	CWS	PRS	MTE	ETE	PRE
1.	BT-441	<b>Biodiversity, Bioprospecting, and Organic-farming</b>	DEC	4	3	1	0	3	0	25	-	25	50	-
2.	BT-442	<b>Molecular Biophysics</b>	DEC	4	3	1	0	3	0	25	-	25	50	-
3.	BT-443	<b>Gene Regulation</b>	DEC	4	3	1	0	3	0	25	-	25	50	-
4.	BT-444	<b>Instrumental Methods of Analysis</b>	DEC	4	3	1	0	3	0	25	-	25	50	-
5.	BT-445	<b>Genomics and Proteomics</b>	DEC	4	3	1	0	3	0	25	-	25	50	-
6.	BT-446	<b>Metabolic Engineering</b>	DEC	4	3	1	0	3	0	25	-	25	50	-
7.	BT-447	<b>Protein Engineering</b>	DEC	4	3	1	0	3	0	25	-	25	50	-
8.	BT-448	<b>Structural Analysis by NMR</b>	DEC	4	3	1	0	3	0	25	-	25	50	-
9.	BT-449	<b>Diagnostics</b>	DEC	4	3	1	0	3	0	25	-	25	50	-
10.	BT-450	<b>Biomolecular Modelling</b>	DEC	4	3	1	0	3	0	25	-	25	50	-
11	BT-451	<b>Cell and Tissue Engineering</b>	DEC	4	3	1	0	3	0	25	-	25	50	-
12.	BT-452	<b>Bioreactor design and analysis</b>	DEC	4	3	1	0	3	0	25	-	25	50	-
13	BT-453	<b>Genetically Modified Organisms</b>	DEC	4	3	1	0	3	0	25	-	25	50	-
14	BT-454	<b>Vaccine Biotechnology</b>	DEC	4	3	1	0	3	0	25	-	25	50	-
15	BT-455	<b>Drug Designing</b>	DEC	4	3	1	0	3	0	25	-	25	50	-
16	BT-456	<b>Industrial Biotechnology</b>	DEC	4	3	1	0	3	0	25	-	25	50	-
17	BT-457	<b>X-Ray Crystallography</b>	DEC	4	3	1	0	3	0	25	-	25	50	-
18	BT-458	<b>Nanobiotechnology</b>	DEC	4	3	1	0	3	0	25	-	25	50	-
19	BT-459	<b>Bioprocess Modeling and Simulation</b>	DEC	4	3	1	0	3	0	25	-	25	50	-
20	BT-460	<b>Separation and Analysis of Biomolecules</b>	DEC	4	3	1	0	3	0	25	-	25	50	-
21	BT-461	<b>Advanced Transfer Processes</b>	DEC	4	3	1	0	3	0	25	-	25	50	-
22	BT-462	<b>Food Biotechnology</b>	DEC	4	3	1	0	3	0	25	-	25	50	-
23	BT-463	<b>Biological Spectroscopy</b>	DEC	4	3	1	0	3	0	25	-	25	50	-
24	BT-464	<b>Bioprocess Economics and Plant Design</b>	DEC	4	3	1	0	3	0	25	-	25	50	-
25	BT-465	<b>Biomolecular NMR</b>	DEC	4	3	1	0	3	0	25	-	25	50	-