

DEPARTMENT OF BIOTECHNOLOGY
DELHI TECHNOLOGICAL UNIVERSITY: DELHI
 Established under Govt. of Delhi Act 6 of 2009
 Shahbad Daulatpur, Bawana Road, Delhi-110042

INTEGRATED B.Sc.-M.Sc. (BIOTECHNOLOGY)

Scheme for Full Time Integrated B.Sc.-M.Sc. as per NEP-2020

First Year (Semester I)

Teaching Scheme					Contact hours / Week		
S.No.	Subject Code	Course title	Course Type	Credit	L	T	P
1.	IMSBT 101	Introduction to Biotechnology	DCC	4	3	1	0
2.	IMSBT 103	Microbiology	DCC	4	3	0	2
3.	IMSBT 105	Biochemistry	DCC	4	3	0	2
4.	IMSBT 107		GEC 1	4	4/3/3	0/1/0	0/0/2
5.	IAEC		AEC 1	2	2	0	0
6.	ISEBT -yz		SEC 1	2	2/1/0	0/1/0	0/0/4
7.	IVAC		VAC 1	2	2/1/0	0/1/0	0/0/4
		Total		22			

Discipline Specific core course (DCC), Generic electives (GEC), Ability Enhancement (AEC), Skill enhancement (SEC) and Value Addition course (VAC), Discipline Specific Laboratory may be included in DCC (4 Cr) with LTP: 0/0/8

MINOR PROGRAM: TRANSLATIONAL HEALTH SCIENCES

First Year (Semester II)

S.No.	Teaching Scheme				Contact hours / Week		
	Subject Code	Course title	Course Type	Credit	L	T	P
1.	IMSBT 102	Molecular Biology	DCC	4	3	0	2
2.	IMSBT 104	Genetics	DCC	4	3	0	2
3.	IMSBT 106	Cell Biology	DCC	4	3	1	0
4.	IMSBT 108		GEC 2	4	4/3/3	0/1/0	0/0/2
5.	IAEC		AEC 2	2	2	0	0
6.	ISEBT -yz		SEC 2	2	2/1/0	0/1/0	0/0/4
7.	IVAC		VAC 2	2	2/1/0	0/1/0	0/0/4
		Total		22			

Exit after one year: After securing 44 credits - awarded Undergraduate Certificate (NHEQF Level-4.5) in the relevant discipline/subject. This certification is contingent upon achieving a minimum of 4 credits through work-based vocational courses offered during the summer term or through internship/apprenticeship experiences, in addition to acquiring 4 credits from skill-based courses undertaken throughout the first and second semesters (Total Credit for exit: 48).

Second Year (Semester III)

Teaching scheme					Contact hours / Week		
S.No.	Subject Code	Course title	Course Type	Credit	L	T	P
1.	IMSBT 201	Basic Techniques in Biological Sciences	DCC	4	3	0	2
2.	IMSBT 203	Introduction to Computational Biology	DCC	4	3	0	2
3.	IMSBT 205	Human Anatomy and Physiology	DCC	4	3	1	0
4.	IMSBT 207		GEC 3	2	2/1/0	0/1/0	0/0/4
5.	IMSBT 2xx		DEC 1 / GEC 4	4	4/3/3	0/1/0	0/0/2
6.	IAEC		AEC 3	2	2	0	0
7.	ISEBT -yz		SEC 3	2	2/1/0	0/1/0	0/0/4
		Total		22			

GEC 1-3 is multidisciplinary & not included in the minor track

Minor track choices to be opted from 3rd semester

Second Year (Semester IV)

Teaching Scheme					Contact hours / Week		
S.No.	Subject Code	Course title	Course Type	Credit	L	T	P
1.	IMSBT 202	Enzymology	DCC	4	3	1	0
2.	IMSBT 204	Environmental Biotechnology	DCC	4	3	0	2
3.	IMSBT 206	Introduction to Nanoscience	DCC	4	3	1	0
4.	IMSBT 2xx		DEC 2 / GEC 5	4	4/3/3	0/1/0	0/0/2
5.	IAEC		AEC 4	2	2	0	0
6.	ISEBT -yz		SEC 4	2	2/1/0	0/1/0	0/0/4
7.	IVAC		VAC 3	2	2/1/0	0/1/0	0/0/4
		Total		22			

Exit after two years: After securing 88 credits - awarded Undergraduate Diploma (NHEQF Level-5.0) in the relevant discipline/subject. This certification is contingent upon achieving a minimum of 4 credits through work-based vocational courses offered during the first year or second year summer (Total Credit for exit: 92).

Third Year (Semester V)

		Teaching Scheme			Contact hours / Week		
S.No.	Subject Code	Course title	Course Type	Credit	L	T	P
1.	IMSBT 301	Bioprocess Engineering	DCC	4	3	0	2
2.	IMSBT 303	Plant Biotechnology	DCC	4	3	0	2
3.	IMSBT 305	Animal Biotechnology	DCC	4	3	0	2
4.	IMSBT 307	Summer Intern		2	-	-	-
5.	IMSBT 3xx		DEC 3/ GEC 6	4	4/3/3/0	0/1/0/0	0/0/2/8
6.	IMSBT 3xx		DEC 4/ GEC 7	4	4/3/3/0	0/1/0/0	0/0/2/8
		Total		22			

Third Year (Semester VI)

S.No.	Teaching Scheme				Contact hours / Week		
	Subject Code	Course title	Course Type	Credit	L	T	P
1.	IMSBT 302	Genomics and Proteomics	DCC	4	3	0	2
2.	IMSBT 304	Advanced Immunology	DCC	4	3	0	2
3.	IMSBT 3xx		DEC 5/ GEC 8	4	4/3/3/0	0/1/0/0	0/0/2/8
4.	IMSBT 3xx		DEC 6/ GEC 9	4	4/3/3/0	0/1/0/0	0/0/2/8
5.	IMSBT 3xx		DEC 7/ GEC 10	2	2/1/0	0/1/0	0/0/4
6.	ISEC 3yz		SEC 5	2	2/1/0	0/1/0	0/0/4
		Total		20			

Exit after three years: After Completing Three Years - Bachelor of Biotechnology - 130 Cr (NHEQF Level-5.5). Students who want to undertake 3-year UG Programme will be awarded UG degree in the relevant Discipline/ Subject upon securing 130 Credits with or without minor. *Research Methodology shall be offered in VI as DEC 5/ GEC 8 included in minor track.

Fourth Year (Semester VII)

S.No.	Subject Code	Teaching Scheme			Contact hours / Week		
		Course title	Course Type	Credit	L	T	P
1.	IMSBT 401	Advances in Biotechnology	DCC	4	3	1	0
2.	IMSBT 403	Healthcare Biotechnology	DCC	4	3	1	0
3.	IMSBT 405	IPR, Bioethics and Biosafety	DCC	4	3	1	0
4.	IMSBT 407	Project 1		6	-	-	-
5.	IMSBT 4xx		DEC 8/ GEC 11	2	2/1/0	0/1/0	0/0/4
		Total		20			

Project - 1 or Entrepreneurship like startups, business etc.

The Project 1 or Entrepreneurship will start in VII semester and continued to VIII semester; however, their evaluation will be done in both the semesters.

Fourth Year (Semester VIII)

S.No.	Teaching Scheme				Contact hours / Week		
	Subject Code	Course title	Course Type	Credit	L	T	P
1.	IMSBT 402	Fermentation and Industrial Biotechnology	DCC	4	3	1	0
2.	IMSBT 404	Advanced Techniques in Genome and Proteome Engineering	DCC	4	3	1	0
3.	IMSBT 406	Project 2		6	-	-	-
4.	IMSBT 4xx		DEC 9/ GEC 12	4	4/3/3/0	0/1/0/0	0/0/2/8
5.	IMSBT 4xx		DEC 10/GEC 13	2	2/1/0	0/1/0	0/0/4
		Total		20			

Project 2 or Entrepreneurship like startups, business etc. The Project - 2 or Entrepreneurship will be in continuation of VII semester and continued to VIII semester, however, their evaluation will be done in both semesters.

Exit after four years: After Completing Four Years - Bachelor of Biotechnology (Honours) with Research/Academic Projects/Entrepreneurship - 170 Cr (NHEQF Level-6.0) will be awarded UG degree (Honours) with Research in the relevant Discipline/ Subject upon securing 170 Credits with or without minor.

Generic Electives Course (GEC)													
	Teaching Scheme				Contact hours / Week			Relative Weightage					GEC
S.No.	Subject Code	Course title	Course Type	Credit	L	T	P	CWS	PRS	MTE	ETE	PRE	
1.	IMSBT 107	Current Topics in Biotechnology	GEC	4	3	1	0	25	-	25	50	-	GEC1
2.	IMSBT 108	Healthcare and Diagnostics	GEC	4	3	1	0	25	-	25	50	-	GEC2
3.	IMSBT 207	Food Nutrition and Hygiene	GEC	2	2	0	0	25	-	25	50	-	GEC3
4.	IMSBT 209	Biosensors	GEC	4	3	1	0	25	-	25	50	-	GEC4
5.	IMSBT 211	Basic Epidemiology	GEC	4	3	1	0	25	-	25	50	-	
6.	IMSBT 208	Introduction to Biomedical Engineering	GEC	4	3	1	0	25	-	25	50	-	GEC5
7.	IMSBT 210	Green Energy Technology	GEC	4	3	1	0	25	-	25	50	-	
8.	IMSBT 309	Biopolymers	GEC	4	3	1	0	25	-	25	50	-	GEC6
9.	IMSBT 311	Cancer Biology	GEC	4	3	1	0	25	-	25	50	-	
10.	IMSBT 313	Immunotechnology and Molecular Virology	GEC	4	3	1	0	25	-	25	50	-	GEC7
11.	IMSBT 315	Pharmaceutical Sciences	GEC	4	3	1	0	25	-	25	50	-	
12.	IMSBT 306	Principles of Toxicology	GEC	4	3	1	0	25	-	25	50	-	GEC8
13.	IMSBT 308	Biomaterials	GEC	4	3	1	0	25	-	25	50	-	
14.	IMSBT 310	Molecular Therapeutics	GEC	4	3	1	0	25	-	25	50	-	GEC9
15.	IMSBT 312	Vaccine Technology	GEC	4	3	1	0	25	-	25	50	-	
16.	IMSBT 314	Food Biotechnology	DEC	2	0	0	4	-	50	-	-	50	GEC10
17.	IMSBT 316	Basics of Computer Applications	GEC	2	0	0	4	-	50	-	-	50	
18.	IMSBT 409	Computer Aided Drug Design	GEC	2	0	0	4	-	50	-	-	50	GEC11
19.	IMSBT 411	Algal Biotechnology	GEC	2	0	0	4	-	50	-	-	50	
20.	IMSBT 408	Neuroscience	GEC	4	3	1	0	25	-	25	50	-	GEC12
21.	IMSBT 410	OMICs in Medicine	GEC	4	3	1	0	25	-	25	50	-	
22.	IMSBT 412	Molecular Docking and Simulation	GEC	2	0	0	4	-	50	-	-	50	GEC13
23.	IMSBT 414	Biotechnology Entrepreneurship	GEC	2	2	0	0	25	-	25	50	-	

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DEPARTMENT ELECTIVE COURSE (DEC)													
	Teaching Scheme				Contact hours / Week			Relative Weightage					DEC
S.No.	Subject Code	Course title	Course Type	Credit	L	T	P	CW S	PR S	MT E	ET E	PR E	
1.	IMSBT 213	Transgenic Technology	DEC	4	3	1	0	25	-	25	50	-	DEC 1
2.	IMSBT 215	Population Genetics	DEC	4	3	1	0	25	-	25	50	-	
3.	IMSBT 217	Metabolic Engineering	DEC	4	3	1	0	25	-	25	50	-	
4.	IMSBT 212	Protein Engineering	DEC	4	3	1	0	25	-	25	50	-	DEC 2
5.	IMSBT 214	Ecology and Evolution	DEC	4	3	1	0	25	-	25	50	-	
6.	IMSBT 216	Medical Microbiology	DEC	4	3	1	0	25	-	25	50	-	
7.	IMSBT 317	Bioenergy and Biofuels	DEC	4	3	1	0	25	-	25	50	-	DEC 3
8.	IMSBT 319	Agriculture Microbiology	DEC	4	3	1	0	25	-	25	50	-	
9.	IMSBT 321	Stem Cells and Regenerative Medicine	DEC	4	3	1	0	25	-	25	50	-	
10.	IMSBT 323	Genomics in Medicine	DEC	4	3	1	0	25	-	25	50	-	DEC 4
11.	IMSBT 325	Advances in Computational Biology	DEC	4	3	0	2	15	25	20	40	-	
12.	IMSBT 327	Developmental Biology	DEC	4	3	1	0	25	-	25	50	-	
13.	IMSBT 318	Concepts in Neurobiology	DEC	4	3	1	0	25	-	25	50	-	DEC 5
14.	IMSBT 320	Medical Biotechnology	DEC	4	3	1	0	25	-	25	50	-	
15.	IMSBT 322	Microbial Systems Biology	DEC	4	3	1	0	25	-	25	50	-	
16.	IMSBT 324	Crop Protection and Pest Management	DEC	4	3	1	0	25	-	25	50	-	DEC 6
17.	IMSBT 326	Structural Biology and Biophysics	DEC	4	3	1	0	25	-	25	50	-	
18.	IMSBT 328	One Health and Emerging Global Health Threats	DEC	4	3	1	0	25	-	25	50	-	
19.	IMSBT 330	Plant Bioinformatics	DEC	2	0	0	4	-	50	-	-	50	DEC 7
20.	IMSBT 332	Molecular and Genetic Techniques	DEC	2	0	0	4	-	50	-	-	50	
21.	IMSBT 334	Upstream Processing in Biotechnology	DEC	2	0	0	4	-	50	-	-	50	
22.	IMSBT 413	Enzyme Technology and Industrial Applications	DEC	2	0	0	4	-	50	-	-	50	DEC 8

23.	IMSBT 415	Biostatistics and Computer Applications	DEC	2	0	0	4	-	50	-	-	50	
24.	IMSBT 417	Environmental and Emerging Biotechnological Techniques	DEC	2	0	0	4	-	50	-	-	50	
25.	IMSBT 416	Gene Therapy	DEC	4	3	1	0	25	-	25	50	-	DEC 9
26.	IMSBT 418	Pharmacogenomics and Personalized Medicine	DEC	4	3	1	0	25	-	25	50	-	
27.	IMSBT 420	Techniques in Protein Biology	DEC	4	3	1	0	25	-	25	50	-	
28.	IMSBT 422	Industrial Skills & Quality Control	DEC	2	0	0	4	-	50	-	-	50	DEC 10
29.	IMSBT 424	Downstream Processing and Bioseparation	DEC	2	0	0	4	-	50	-	-	50	
30.	IMSBT 426	Database Management in Biotechnology	DEC	2	0	0	4	-	50	-	-	50	
31.	IMSBT	Plant Immunology	DEC	4	3	1	0	25	-	25	50	-	
32.	IMSBT	Bioinformatics Approaches in Complex Disorders	DEC	4	3	1	0	25	-	25	50	-	
33.	IMSBT	Bioresource and Bioprospecting Technology	DEC	4	3	1	0	25	-	25	50	-	
34.	IMSBT	Bacterial Stress Biology and Industrial Applications	DEC	4	3	1	0	25	-	25	50	-	

Skill Enhancement Courses (SEC)												
	Teaching Scheme				Contact hours / Week			Relative Weightage				
S.No.	Subject Code	Course title	Course Type	Credit	L	T	P	CWS	PRS	MTE	ETE	PRE
1.	ISEBT -yz	Aquaculture	SEC	2	2	0	0	25	-	25	50	-
2.	ISEBT -yz	Diagnostic Techniques	SEC	2	0	0	4	-	50	-	-	50
3.	ISEBT -yz	Cell Culture Techniques	SEC	2	0	0	4	-	50	-	-	50
4.	ISEBT -yz	Machine Learning in Biotechnology	SEC	2	0	0	4	-	50	-	-	50
5.	ISEBT -yz	Bioinstrumentation	SEC	2	0	0	4	-	50	-	-	50

Value Addition Courses (VAC)												
	Teaching Scheme				Contact hours / Week			Relative Weightage				
S.No.	Subject Code	Course title	Course Type	Credit	L	T	P	CWS	PRS	MTE	ETE	PRE
1	IVABT -yz	Ethics in Science	VAC	2	2	0	0	25	-	25	50	-
2	IVABT -yz	Biotechnology for Society	VAC	2	2	0	0	25	-	25	50	-
3	IVABT -yz	Science of Well-being	VAC	2	2	0	0	25	-	25	50	-
4	IVABT -yz	Human Nutrition	VAC	2	2	0	0	25	-	25	50	-
5	IVABT -yz	Introduction to Biological Sciences	VAC	2	2	0	0	25	-	25	50	-

Ability Enhancement Courses (AEC)												
	Teaching Scheme				Contact hours/Week			Relative Weightage				
S.No.	Subject Code	Course title	Course Type	Credit	L	T	P	CWS	PRS	MTE	ETE	PRE
1.	IAEBT -yz	Applied Biostatistics	AEC	2	2	0	0	25	-	25	50	-
2.	IAEBT -yz	Research Methodology	AEC	2	2	0	0	25	-	25	50	-
3.	IAEBT -yz	Bioinformatics	AEC	2	2	0	0	25	-	25	50	-