AMITY INSTITUTE OF BIOTECHNOLOGY

FLEXILEARN
-Freedom to design your degree

PROGRAMME STRUCTURES

2020

AMITY UNIVERSITY HARYANA

GURUGRAM

13044 B.Sc.-Biotechnology (Hons) (Total Credits-150)

Programme Structure-2020

FIRST SEMESTER

Course Code	Course Title	Lecture (L) Hours Per week	Tutorial (T) Hours Per week	Practical (P) Hours Per week	Total Credits
BTH2101	Plant Sciences-I	2	1	-	3
BTH2102	Animal Sciences-I	2	1	-	3
BTH2103	Computers Applications	2	1	-	3
BTH2104	Plant Sciences-I Lab	-	-	2	1
BTH2105	Animal Sciences-I Lab	-	-	2	1
BTH2106	Computers Applications Lab	-	-	2	1
Concentration Electives					**3**
BTH2107	Microbial Biotechnology	3	-	-	3
BTH2108	Food Biotechnology	3	-	-	3
BTH2109	Agriculture Biotechnology	3	-	-	3
BTH2131	Term Paper	2	-	-	2
BTH2132	Project (with Presentation & Evaluation)	-	-	-	3
BTH2133	Workshop / Certification (Discipline Specific) **(1credit per workshop)**	-	-	-	1
BTH2134	Study Abroad	-	-	-	3
Open Electives					**9*+3**
LAN2151 LAN2152 LAN2153 LAN2154 LAN2155 LAN2156 LAN2157 LAN2158 LAN2159	Foreign Language-I* French-I German-I Spanish-I Russian-I Chinese-I Portuguese-I Korean-I Japanese-I Hindi-I **	3	-	-	3
CSS2151	Effective Listening*	1	-	-	1
BEH2151	Understanding Self Effectiveness*	1	-	-	1
ENV2152	Environmental Studies*	4	-	-	4
	Minor Track Course (Flexi)	-	-	-	**3**
	TOTAL				**27**

** Hindi as Foreign Language for Foreign National Students

SECOND SEMESTER

Course Code	Course Title	Lecture (L) Hours Per week	Tutorial (T) Hours Per week	Practical (P) Hours Per week	Total Credits
BTH2201	Plant Sciences-II	2	1	-	3
BTH2202	Animal Sciences-II	2	1	-	3
BTH2203	Animal Physiology	2	-	-	2
BTH2204	Plant Physiology	2	-	-	2
BTH2205	Plant sciences-II Lab	-	-	2	1
BTH2206	Animal sciences-II Lab	-	-	2	1
BTH2207	Plant Physiology Lab	-	-	2	1
BTH2208	Animal Physiology Lab	-	-	2	1
Concentration Electives					**3**
BTH2209	Molecular Modeling	3	-	-	3
BTH2210	Bio-safety and Bioethics	3	-	-	3
BTH2211	Bioinformatics	2	1	-	3
BTH2231	Term Paper	-	-	-	2
BTH2232	Project(with Presentation &Evaluation)	-	-	-	3
BTH2233	Workshop/ Certification (Discipline Specific) **1credit per workshop)**	-	-	-	1
BTH2234	Study Abroad	-	-	-	3
Open Electives					**5*+3**
LAN2251 LAN2252 LAN2253 LAN2254 LAN2255 LAN2256 LAN2257 LAN2258 LAN2259	Foreign Language-II* French-II German-II Spanish-II Russian-II Chinese-II Portuguese-II Korean-II Japanese-II Hindi-II	3	-	-	3
CSS2251	Presentation Skills*	1	-	-	1
BEH2251	Problem Solving and Creative Thinking*	1	-	-	1
	Minor Track Course (Flexi)	-	-	-	**3**
TOTAL					**25**

THIRD SEMESTER

Course Code	Course Title	Lecture (L) Hours Per week	Tutorial (T) Hours Per week	Practical (P) Hours Per week	Total Credits
BTH2301	Biochemistry	2	1	-	3
BTH2302	Microbiology	2	1	-	3
BTH2303	Enzymology	2	1	-	3
BTH2304	Genetics & Cell Biology	2	1	-	3
BTH2305	Biochemistry Lab	-	-	2	1
BTH2306	Microbiology Lab	-	-	2	1
BTH2307	Enzymology Lab	-	-	2	1
BTH2308	Genetics & Cell Biology Lab	-	-	2	1
Concentration Electives					**3**
BTH2309	Intellectual property rights	3	-	-	3
BTH2310	Pharmaceutical Biotechnology	3	-	-	3
BTH2311	Clinical Biotechnology	3	-	-	3
BTH2331	Term Paper	-	-	-	2
BTH2332	Project(with Presentation &Evaluation)	-	-	-	3
BTH2333	Workshop/ Certification (Discipline Specific) **(1credit per workshop)**	-	-	-	1
BTH2334	Study Abroad	-	-	-	3
Open Electives					**4*+3**
LAN2351 LAN2352 LAN2353 LAN2354 LAN2355 LAN2356 LAN2357 LAN2358 LAN2359	Foreign Language-III* French-III German-III Spanish-III Russian-III Chinese-III Portuguese-III Korean-III Japanese-III Hindi-III	2	-	-	2
CSS2351	Reading and Comprehension*	1	-	-	1
BEH2351	Group Dynamics and Team Buildings*****	1	-	-	1
	Minor Track Course (Flexi)	-	-	-	**3**
TOTAL					**26**

FOURTH SEMESTER

Course Code	Course Title	Lecture (L) Hours Per week	Tutorial (T) Hours Per week	Practical (P) Hours Per week	Total Credits
BTH2401	Molecular Biology	3	-	-	3
BTH2402	Introductory Immunology	3	-	-	3
BTH2403	Instrumentation & Bioanalytical techniques	2	-	-	2
BTH2404	Research Methodology	2	-	-	2
BTH2405	In Silico analysis of Biomolecules	2	-	-	2
BTH2406	Molecular Biology Lab	-	-	2	1
BTH2407	Introductory Immunology Lab	-	-	2	1
BTH2408	In Silico analysis of Biomolecules Lab	-	-	2	1
Concentration Electives					**3**
BTH2409	Nano Biotechnology	2	1	-	3
BTH2410	Forensic Biotechnology	2	1	-	3
BTH2411	Genetically Modified Organism	2	1	-	3
BTH2431	Term Paper	2	-	-	2
BTH2432	Project (with Presentation & Evaluation)	-	-	-	3
BTH2433	Workshop / Certification (Discipline Specific) (1credit per workshop)	-	-	-	1
BTH2434	Study Abroad	-	-	-	3
Open Electives					**4*+3**
LAN2451 LAN2452 LAN2453 LAN2454 LAN2455 LAN2456 LAN2457 LAN2458 LAN2459	Foreign Language-IV* French-IV German-IV Spanish-IV Russian-IV Chinese-IV Portuguese-IV Korean-IV Japanese-IV Hindi-IV	2	-	-	2
CSS2451	Corporate Communication*	1	-	-	1
BEH2451	Stress and Coping Strategies*	1	-	-	1
	Minor Track Course (Flexi)	-	-	-	**3**
TOTAL					**25**

FIFTH SEMESTER

Course Code	Course Title	Lecture (L) Hours Per week	Tutorial (T) Hours Per week	Practical (P) Hours Per week	Total Credits
BTH2501	Animal Biotechnology	2	-	-	2

BTH2502	PlantBiotechnology	2	-	-	2
BTH2503	Stem Cell & Gene Therapy	3	-	-	3
BTH2504	Marine biotechnology	3	-	-	3
BTH2505	Biosensors	3	-	-	3
BTH2509	Animal Biotechnology Lab	-	-	2	1
BTH2510	Plant Biotechnology Lab	-	-	2	1
Concentration Electives					**3**
BTH2506	Modern Killer diseases	3	-	-	3
BTH2507	Biofuels and Green Biotechnology	3	-	-	3
BTH2508	Artificial Neural Network	3	-	-	3
BTH2511	Introductory Nanobiotechnology	3	-	-	3
BTH2512	Integrated Biomaterials	3	-	-	3
BTH2531	Term Paper	2	-	-	2
BTH2532	Project (with Presentation & Evaluation)	-	-	-	3
BTH2533	Workshop / Certification (Discipline Specific) (1credit per workshop)	-	-	-	1
BTH2534	Study Abroad	-	-	-	3
Open Electives					**4*+3**
LAN2551 LAN2552 LAN2553 LAN2554 LAN2555 LAN2556 LAN2557 LAN2558 LAN2559	Foreign Language-V* French-V German-V Spanish-V Russian-V Chinese-V Portuguese-V Korean-V Japanese-V Hindi-V	2	-	-	2
CSS2551	Employability Skills*	1	-	-	1
BEH2551	Individual, Society and Nations*	1	-	-	1
	Minor Track Course (Flexi)	-	-	-	**3**
	TOTAL				**25**

SIXTH SEMESTER

Course Code	Course Title	Lecture (L) Hours	Tutorial (T) Hours Per week	Practical (P) Hours Per week	Total Credits
BTH2601	Recombinant DNA Technology	3	-	-	3
BTH2602	Genomics & Proteomics	2	-	-	2
BTH2603	Industrial Biotechnology	3	-	-	3
BTH2604	Stress Biology	3	-	-	3
BTH2605	Recombinant DNA Technology Lab	-	-	4	2
BTH2609	Genomics & Proteomics Lab	-	-	2	1
Concentration Electives					**3**

BTH2606	Biosafety Management	3	-	-	3
BTH2607	Drug Design and Development	3	-	-	3
BTH2608	Bioprocess Technology	3	-	-	3
BTH2631	Term Paper	2	-	-	2
BTH2632	Project (with Presentation & Evaluation)	-	-	-	3
BTH2633	Workshop / Certification (Discipline Specific) **1credit per workshop**	-	-	-	1
BTH2634	Study Abroad	-	-	-	3
Open Electives					**2^*+3**
CSS2651	Work Place Communication*	1	-	-	1
BEH2651	Interpersonal Communication and Relationship Management*	1	-	-	1
	Minor Track Course (Flexi)	-	-	-	**3**
	TOTAL				**22**

13692 B.Sc. (Honors) Biological Science (Total Credits-150)

Programme Structure-2020

FIRST SEMESTER

Course Code	Course Title	Lecture (L) Hours Per week	Tutorial (T) Hours Per week	Practical (P) Hours Per week	Total Credit
BLS2101	Plant Diversity-I	3	-	-	3
BLS2102	Animal Diversity-I	3	-	-	3
BLS2103	Chemistry-I	2	1	-	3
BLS2104	Physics-I	2	1	-	3
BLS2105	Mathematics-I	2	1	-	3
BLS2106	Plant &Animal Diversity Lab-I	-	-	4	2
BLS2107	Chemistry Lab-I	-	-	2	1
BLS2108	Physics Lab-I	-	-	2	1
Open Electives					**9*+3**
LAN2151 LAN2152 LAN2153 LAN2154 LAN2155 LAN2156 LAN2157 LAN2158 LAN2159	Foreign Language-I* French-I German-I Spanish-I Russian-I Chinese-I Portuguese-I Korean-I Japanese-I Hindi-I **	3	-	-	3
CSS2151	Effective Listening*	1	-	-	1
BEH2151	Understanding Self for Effectiveness*	1	-	-	1
ENV2152	Environmental Studies *	4	-	-	4
	Minor Track Course (Flexi)	-	-	-	**3**
	TOTAL				**31**

** Hindi as Foreign Language for Foreign National Students

SECOND SEMESTER

Course Code	Course Title	Lecture (L) Hours Per	Tutorial (T) Hours Per week	Practical (P) Hours Per week	Total Credit
BLS2201	Plant Diversity II	3	-	-	3
BLS2202	Animal Diversity II	3	-	-	3
BLS2203	Chemistry II	2	1	-	3
BLS2204	Physics II	2	1	-	3
BLS2205	Mathematics II	2	1	-	3
BLS2206	Plant & Animal Diversity Lab II	-	-	4	2
BLS2207	Chemistry Lab II	-	-	2	1
BLS2208	Physics Lab II	-	-	2	1
Open Electives					**5*+3**
LAN2251 LAN2252 LAN2253 LAN2254 LAN2255 LAN2256 LAN2257 LAN2258 LAN2259	Foreign Language – II* French-II German-II Spanish-II Russian -II Chinese-II Portuguese-II Korean-II Japanese-II Hindi-II	3	-	-	3
CSS2251	Presentation Skills *	1	-	-	1
BEH2251	Problem Solving and Creative Thinking*	1	-	-	1
	Minor Track Course (Flexi)	-	-	-	**3**
TOTAL					**27**

THIRD SEMESTER

Course Code	Course Title	Lecture (L) Hours Per week	Tutorial (T) Hours Per week	Practical (P) Hours Per week	Total Credit
BLS2301	Plant Anatomy	2	-	-	2
BLS2302	Animal Anatomy	2	-	-	2
BLS2303	Cell Biology	3	-	-	3
BLS2304	Genetics	3	-	-	3
BLS2305	Plant & Animal Anatomy Lab	-	-	4	2
BLS2306	Cell biology & Genetics Lab	-	-	2	1

BLS2332	Project (with Presentation & Evaluation)	-	-	-	4
Open Electives					**4*+3**
LAN2351 LAN2352 LAN2353 LAN2354 LAN2355 LAN2356 LAN2357 LAN2358 LAN2359	Foreign Language – III * French-III German-III Spanish-III Russian -III Chinese-III Portuguese-III Korean-III Japanese-III Hindi-III	2	-	-	2
CSS2351	Reading & Comprehension*	1	-	-	1
BEH2351	Group Dynamics and Team Building*	1	-	-	1
	Minor Track Course (Flexi)	-	-	-	**3**
TOTAL					**24**

FOURTH SEMESTER

Course Code	Course Title	Lecture (L) Hours Per week	Tutorial (T) Hours Per week	Practical (P) Hours Per week	Total Credit
BLS2401	Plant Physiology	2	-	-	2
BLS2402	Animal Physiology	2	-	-	2
BLS2403	Microbiology	3	-	-	3
BLS2404	Biostats & Bioinformatics	2	1	-	3
BLS2405	Ecology & Evolution	3	-	-	3
BLS2406	Plant & Animal Physiology Lab	-	-	4	2
BLS2407	Microbiology Lab	-	-	2	1
Open Electives					**4*+3**
LAN2451 LAN2452 LAN2453 LAN2454 LAN2455 LAN2456 LAN2457 LAN2458 LAN2459	Foreign Language – IV* French-IV German-IV Spanish-IV Russian -IV Chinese-IV Portuguese-IV Korean-IV Japanese-IV Hindi-IV	2	-	-	2
CSS2451	Corporate Communication*	1	-	-	1
BEH2451	Stress and Coping Strategies*	1	-	-	1
	Minor Track Course (Flexi)	-	-	-	**3**
TOTAL					**23**

SUMMER PROJECT

FIFTH SEMESTER

Course Code	Course Title	Lecture (L) Hours Per week	Tutorial (T) Hours Per week	Practical (P) Hours Per week	Total Credit
BLS2501	Molecular Biology	3	-	-	3
BLS2502	Biochemistry	3	-	-	3
BLS2503	Immunology	3	-	-	3
BLS2504	Bio-analytical & Biophysical Techniques	2	-	-	2
BLS2505	Biomaterials	2	-	-	2
BLS2506	Molecular Biology Lab	-	-	2	1
BLS2507	Immunology Lab	-	-	2	1
BLS2508	Biochemistry & Bio-analytical Lab	-	-	2	1
BLS2535	Summer Internship Project (Evaluation)	-	-	-	4
Open Electives					**4*+3**
LAN2551 LAN2552 LAN2553 LAN2554 LAN2555 LAN2556 LAN2557 LAN2558 LAN2559	Foreign Language-V* French-V German-V Spanish-V Russian -V Chinese-V Portuguese-V Korean-V Japanese-V Hindi-V	2	-	-	2
CSS2551	Employability Skills*	1	-	-	1
BEH2551	Individual, Society and Nations*	1	-	-	1
	Minor Track Course (Flexi)	-	-	-	**3**
	TOTAL				**27**

SIXTH SEMESTER

Course Code	Course Title	Lecture (L) Hours Per week	Tutorial (T) Hours Per week	Practical (P) Hours Per week	Total Credit
BLS2601	Recombinant DNA Technology	3	-	-	3
BLS2602	Genomics &proteomics	3		-	3
BLS2603	IPR, Biosafety & Bioethics	2	-	-	2
BLS2604	Applied Biology	3	-	-	3

BLS2605	Recombinant DNA Technology Lab	-	-	2	1
BLS2606	Applied Biology Lab	-	-	2	1
Open Electives					**$2^* + 3$**
CSS2651	Workplace Communication*	1	-	-	1
BEH2651	Interpersonal Communication and Relationship Management*	1	-	-	1
	Minor Track Course (Flexi)	-	-	-	**3**
	TOTAL				**18**

* Compulsory

13041 B.Tech. - Biotechnology (Total Credits-195)

Programme Structure-2020

FIRST SEMESTER

Course Code	Course Title	Lectures (L) Hours Per Week	Tutorial (T) Hours Per Week	Practical (P) Hours Per Week	Total Credits
BTE2104	Introduction to Computers & Programming in 'C'	2	1	-	3
BTE2106	Electrical Science	2	1	-	3
BTE2108	Programming in C Lab	-	-	2	1
BTE2110	Electrical Science Lab	-	-	2	1
BTE2111	Engineering Mathematics-I	3	1	-	4
BTE2112	Engineering Chemistry	2	-	-	2
BTE2113	Engineering Chemistry Lab	-	-	2	1
Open Electives					**5**
CSS2152	English-I *	1	-	-	1
BEH2151	Understanding Self for Effectiveness*	1	-	-	1
LAN2170 LAN2152 LAN2153 LAN2154 LAN2155 LAN2156 LAN2157 LAN2158 LAN2159	Foreign Language-I* French for Technology-I German-I Spanish-I Russian-I Chinese-I Portuguese-I Korean-I Japanese-I Hindi-I **	3	-	-	3
TOTAL					**20**

** Hindi as Foreign Language for Foreign National Students

SECOND SEMESTER

Course Code	Course Title	Lectures (L) Hours Per Week	Tutorial (T) Hours Per Week	Practical (P) Hours Per Week	Total Credits
BTE2203	Object Oriented Programming in C++	2	1	-	3
BTE2205	Object Oriented Programming in C++ Lab	-	-	2	1
BTE2206	Engineering Graphics Lab	-	-	2	1
BTE2207	Engineering Mathematics-II	3	1	-	4
BTE2208	Engineering Physics	2	1	-	3
BTE2209	Engineering PhysicsLab	-	-	2	1

Course Code	Course Title	Lectures (L) Hours Per Week	Tutorial (T) Hours Per Week	Practical (P) Hours Per Week	Total Credits
BTE2210	Life Sciences	3	-	-	3
	Open Electives				**9**
CSS2252	English-II *	1	-	-	1
BEH2251	Problem Solving and Creative Thinking*	1	-	-	1
ENV2252	Environmental Studies*	4	-	-	4
LAN2270 LAN2252 LAN2253 LAN2254 LAN2255 LAN2256 LAN2257 LAN2258 LAN2259	Foreign Language – II* French for Technology-II German-II Spanish-II Russian-II Chinese-II Portuguese-II Korean-II Japanese-II Hindi-II	3	-	-	3
	TOTAL				**25**

THIRD SEMESTER

Course Code	Course Title	Lectures (L) Hours Per Week	Tutorial (T) Hours Per Week	Practical (P) Hours Per Week	Total Credits
BTE2301	Cell Biology & Genetics	3	-	-	3
BTE2302	Biochemistry	3	-	-	3
BTE2303	Biostatistics	3	-	-	3
BTE2304	Database Management System	2	-	-	2
BTE2305	Chemical Biology	2	-	-	2
BTE2306	Biochemistry Lab	-	-	4	2
BTE2307	Cell Biology & Genetics Lab	-	1	2	2
BTE2308	Database Management System Lab	-	-	2	1
	Concentration Electives				**2**
BTE2309	Industrial Biotechnology	2	-	-	2
BTE2310	Fermentation technology	2	-	-	2
BTE2311	Drug Design and Development	2	-	-	2
BTE2312	Recombinant DNA Technology	2	-	-	2
BTE2331	Term Paper	-	-	-	2
BTE2332	Project (with Presentation & Evaluation)	-	-	-	2
BTE2333	Workshop / Certification (Discipline Specific)	-	-	-	2
BTE2334	Study Abroad	-	-	-	2
	Open Electives				**4*+3**
CSS2151	Effective Listening *	1	-	-	1
BEH2351	Group Dynamics and Team Building*	1	-	-	1

Course Code	Course Title	L	T	P	Credits
LAN2370	Foreign Language-III * French for Technology- III	2	-	-	2
LAN2352	German-III				
LAN2353	Spanish-III				
LAN2354	Russian-III				
LAN2355	Chinese-III				
LAN2356	Portuguese-III				
LAN2357	Korean-III				
LAN2358	Japanese-III				
LAN2359	Hindi-III				
	Minor Track Course (Flexi)	-	-	-	**3**
TOTAL					**27**

FOURTH SEMESTER

Course Code	Course Title	Lectures (L) Hours Per Week	Tutorial (T) Hours Per Week	Practical (P) Hours Per Week	Total Credits
BTE2401	Microbiology	3	-	-	3
BTE2402	Data Structure & Algorithms	2	-	-	2
BTE2403	Enzymology & Enzyme Technology	3	-	-	3
BTE2404	Chemical Engineering Principles	2	-	-	2
BTE2405	Methods and Instrumentation in Biotechnology	3	-	-	3
BTE2406	Microbiology Lab	-	-	4	2
BTE2407	Data Structure & Algorithms Lab	-	-	2	1
BTE2408	Enzymology & Enzyme Technology Lab	-	-	2	1
BTE2409	Methods and Instrumentation in Biotechnology Lab	-	-	2	1
Concentration Electives					**2**
BTE2410	Marine Biotechnology	2	-	-	2
BTE2411	Vaccine Development	2	-	-	2
BTE2412	Agricultural Biotechnology	2	-	-	2
BTE2413	Natural products and medicinal chemistry	2	-	-	2
BTE2414	Stem cell Technology	2	-	-	2
BTE2431	Term Paper	-	-	-	2
BTE2432	Project (with Presentation & Evaluation)	-	-	-	2
BTE2433	Workshop / Certification (Discipline Specific)	-	-	-	2
BTE2434	Study Abroad	-	-	-	2
Open Electives					**4*+3**
CSS2251	Presentation Skills*	1	-	-	1

Course Code	Course Title	L	T	P	Total
BEH2451	Stress and Coping Strategies*	1	-	-	1
	Foreign Language-IV*	2	-	-	2
LAN2470	French for Technology-IV				
LAN2452	German-IV				
LAN2453	Spanish-IV				
LAN2454	Russian-IV				
LAN2455	Chinese-IV				
LAN2456	Portuguese-IV				
LAN2457	Korean-IV				
LAN2458	Japanese-IV				
LAN2459	Hindi-IV				
	Minor Track Course (Flexi)	-	-	-	**3**
TOTAL					**27**

SUMMER INTERNSHIP
FIFTH SEMESTER

Course Code	Course Title	Lectures (L) Hours Per Week	Tutorial (T) Hours Per Week	Practical (P) Hours Per Week	Total Credits
BTE2501	Molecular Biology	3	-	-	3
BTE2502	Animal Biotechnology	3	-	-	3
BTE2503	Plant Biotechnology	3	-	-	3
BTE2504	Bioinformatics	3	-	-	3
BTE2505	Molecular Biology Lab	-	-	2	1
BTE2506	Animal Biotechnology Lab	-	-	4	2
BTE2507	Plant Biotechnology Lab	-	-	4	2
BTE2508	Bioinformatics Lab	-	-	2	1
BTE2535	Summer Internship Evaluation-I	-	-	-	3
Concentration Electives					**2**
BTE2509	Biofuels & Green Technology	2	-	-	2
BTE2510	Stem Cells and Tissue Engineering	2	-	-	2
BTE2511	Java-I	1	-	2	2
BTE2531	Term Paper	-	-	-	2
BTE2532	Project (with Presentation & Evaluation)	-	-	-	2
BTE2533	Workshop / Certification (Discipline Specific)	-	-	-	2
BTE2534	Study Abroad	-	-	-	2
Open Electives					**4*+3**
CSS2351	Reading & Comprehension *	1	-	-	1
BEH2552	Personality, Nationalism and Human Values*	1	-	-	1

Course Code	Course Title	L	T	P	Credits
LAN2570	Foreign Language – V* French for Technology-V	2	-	-	2
LAN2552	German-V				
LAN2553	Spanish-V				
LAN2554	Russian-V				
LAN2555	Chinese-V				
LAN2556	Portuguese-V				
LAN2557	Korean-V				
LAN2558	Japanese-V				
LAN2559	Hindi-V				
	Minor Track Course (Flexi)	-	-	-	**3**
TOTAL					**30**

SIXTH SEMESTER

Course Code	Course Title	Lectures (L) Hours Per Week	Tutorial (T) Hours Per Week	Practical (P) Hours Per Week	Total Credits
BTE2601	Recombinant DNA Technology	3	-	-	3
BTE2602	Bioprocess Technology	3	-	-	3
BTE2603	Immunology & Immunotechnology	3	-	-	3
BTE2604	Fundamentals of Biochemical Engineering	2	-	-	2
BTE2605	Recombinant DNA Technology Lab	-	-	4	2
BTE2606	Bioprocess Technology Lab	-	-	4	2
BTE2607	Immunology & Immunotechnology Lab	-	-	2	1
Concentration Electives					**2**
BTE2608	Pharmaceutical Biotechnology	2	-	-	2
BTE2609	Molecular modeling	2	-	-	2
BTE2610	Artificial Neural network	2	-	-	2
BTE2611	JAVA –II	1	-	2	2
BTE2612	RNA Biology	2	-	-	2
BTE2631	Term Paper	-	-	-	2
BTE2632	Project (with Presentation & Evaluation)	-	-	-	2
BTE2633	Workshop / Certification (Discipline Specific)	-	-	-	2
BTE2634	Study Abroad	-	-	-	2
Open Electives					**4*+3**
CSS2451	Corporate Communication *	1	-	-	1
BEH2652	Interpersonal Communication	1	-	-	1

Course Code	Course Title	Lectures (L) Hours Per Week	Tutorial (T) Hours Per Week	Practical (P) Hours Per Week	Total Credits
LAN2670 LAN2652 LAN2653 LAN2654 LAN2655 LAN2656 LAN2657 LAN2658 LAN2659	Foreign Language – VI* French for Technology-VI German-VI Spanish-VI Russian-VI Chinese-VI Portuguese-VI Korean-VI Japanese-VI Hindi-VI	2	-	-	2
	Minor Track Course (Flexi)	-	-	-	**3**
	TOTAL				**25**

SUMMER INTERNSHIP
SEVENTH SEMESTER

Course Code	Course Title	Lectures (L) Hours Per Week	Tutorial (T) Hours Per Week	Practical (P) Hours Per Week	Total Credits
BTE2701	Genomics & Proteomics	3	-	-	3
BTE2702	IPR, Biosafety & Bioethics	2	-	-	2
BTE2703	Research Methodology & Report Writing	2	-	-	2
BTE2704	Genomics & Proteomics Lab	-	-	4	2
BTE2735	Summer InternshipEvaluation-II	-	-	-	3
Concentration Electives					**2**
BTE2705	Bioprocess Plant Designing	2	-	-	2
BTE2706	Molecular Medicine & Diagnosis	2	-	-	2
BTE2707	Applications of Plant Biotechnology	2	-	-	2
BTE2708	Bioenergy Engineering	2	-	-	2
BTE2709	Advanced Nanobiotechnology	2	-	-	2
BTE2731	Term Paper	-	-	-	2
BTE2732	Project (with Presentation & Evaluation)	-	-	-	2
BTE2733	Workshop/ Certification (Discipline Specific)	-	-	-	2
BTE2734	Study Abroad	-	-	-	2
Open Electives					**4*+3**
CSS2551	Employability Skills*	1	-	-	1
BEH2751	Relationship Management*	1	-	-	1

Course Code	Course Title	Lectures (L) Hours Per Week	Tutorial (T) Hours Per Week	Practical (P) Hours Per Week	Total Credits
LAN2770 LAN2752 LAN2753 LAN2754 LAN2755 LAN2756 LAN2757 LAN2758 LAN2759	Foreign Language-VII* French for Technology-VII German-VII Spanish-VII Russian-VII Chinese-VII Portuguese-VII Korean-VII Japanese-VII Hindi-VII	2	-	-	2
	Minor Track Course (Flexi)	-	-	-	3
TOTAL					21

EIGHTH SEMESTER

Course Code	Course Title	Lectures (L) Hours Per Week	Tutorial (T) Hours Per Week	Practical (P) Hours Per Week	Total Credits
BTE2837	Dissertation / Project Report Presentation / Viva Voce	-	-	-	17
Open Electives					3
	Minor Track Course (Flexi)	-	-	-	3
TOTAL		-	-	-	20

13002 M.Sc.- Biotechnology (Total Credits-100)

Programme Structure-2020

FIRST SEMESTER

Course Code	Course Title	Lectures (L) Hours Per Week	Tutorial (T) Hours Per Week	Practical (P) Hours Per Week	Total Credits
BTH4101	Biochemistry	2	-	-	2
BTH4102	Plant & Animal Physiology	2	-	-	2
BTH4103	Microbiology	3	-	-	3
BTH4104	Genetics	3	-	-	3
BTH4105	Foundation Course - I (Mathematics)	2	-	-	2
BTH4106	Foundation Course - II (Physics)	2	-	-	2
BTH4107	Biochemistry Lab	-	-	4	2
BTH4108	Plant & Animal Physiology Lab	-	-	4	2
BTH4109	Microbiology Lab	-	-	2	1
BTH4110	Genetics Lab	-	-	2	1
Open Electives					**5**
CSS4151	Basics of Communication	1	-	-	1
BEH4151	Self Development & Interpersonal Skills	1	-	-	1
LAN4151 LAN4152 LAN4153 LAN4154 LAN4155 LAN4156 LAN4157 LAN4158 LAN4159	Foreign Business Language-I French-I German-I Spanish-I Russian-I Chinese-I Portuguese-I Korean-I Japanese-I Hindi-I **	3	-	-	3
TOTAL					**25**

** Hindi as Foreign Language for Foreign National Students

SECOND SEMESTER

Course Code	Course Title	Lectures (L) Hours Per Week	Tutorial (T) Hours Per Week	Practical (P) Hours Per Week	Total Credits
BTH4201	Molecular Biology	2	-	-	2
BTH4202	Plant Biotechnology	2	-	-	2

Course Code	Course Title	Lectures (L) Hours Per Week	Tutorial (T) Hours Per Week	Practical (P) Hours Per Week	Total Credits
BTH4203	Immunology	2	-	-	2
BTH4204	Environmental Biotechnology	2	-	-	2
BTH4205	Cell Biology	2	-	-	2
BTH4206	Biostatistics	2	-	-	2
BTH4207	Cell &Molecular Biology Lab	-	-	4	2
BTH4208	Plant Biotechnology Lab	-	-	2	1
BTH4209	Immunology Lab	-		4	2
BTH4231	Term Paper	-	-	-	2
Open Electives					**5**
CSS4251	Corporate Communication	1	-	-	1
BEH4251	Behavioral Communication & Relationship Management	1	-	-	1
LAN4251 LAN4252 LAN4253 LAN4254 LAN4255 LAN4256 LAN4257 LAN4258 LAN4259	Foreign Business Language-II French-II German-II Spanish-II Russian-II Chinese-II Portuguese-II Korean-II Japanese-II Hindi-II	3	-	-	3
TOTAL					**24**

SUMMER INTERNSHIP

THIRD SEMESTER

Course Code	Course Title	Lectures (L) Hours Per Week	Tutorial (T) Hours Per Week	Practical (P) Hours Per Week	Total Credits
BTH4301	Animal Biotechnology	2	-	-	2
BTH4302	Biophysics & Structural Biology	2	-	-	2
BTH4303	Genomics & Proteomics	2	-	-	2
BTH4304	Recombinant DNA Technology	3	-	-	3
BTH4305	Bioinformatics & Computational Biology	2	-	-	2
BTH4306	IPR, Biosafety & Bioethics	2	-	-	2
BTH4307	Recombinant DNA Technology Lab			4	2
BTH4308	Animal Biotechnology Lab	-	-	2	1
BTH4309	Genomics & Proteomics Lab	-	-	4	2
BTH4310	Bioinformatics & Computational Biology Lab	-	-	2	1
BTH4335	Summer Internship Evaluation	-	-	-	6
Elective (Select any One)					**2**
BTH4311	Pharmaceutical Biotechnology & Drug Design	2	-	-	2

BTH4312	Downstream Processing &Fermentation Technology	2	-	-	2
BTH4313	Stem Cell and Gene Therapy	2	-	-	2
BTH4314	Nanobiotechnology	2	-	-	2
BTH4315	New Generation Sequencing Analysis	2	-	-	2
BTH4316	Introductory Nano-Biotechnology	2	-	-	2
BTH4317	Integrated Biomaterials	2	-	-	2
BTH4318	RNA Biology	2	-	-	2
BTH4319	Advances in Plant Genomics	2	-	-	2
	Open Electives				**4**
LAN4351 LAN4352 LAN4353 LAN4354 LAN4355 LAN4356 LAN4357 LAN4358 LAN4359	**Foreign Business Language-III** French-III German-III Spanish-III Russian-III Chinese-III Portuguese-III Korean-III Japanese-III Hindi-III	2	-	-	2
CSS4351	Interpersonal Communication	1	-	-	1
BEH4351	Leading Through Teams	1	-	-	1
	TOTAL				**31**

FOURTH SEMESTER

Course Code	Course Title	Lectures (L) Hours Per Week	Tutorial (T) Hours Per Week	Practical (P) Hours Per Week	Total Credits
BTH4437	Dissertation / Project Report Presentation / Viva Voce	-	-	-	20
	TOTAL	-	-	-	**20**

13107 M.Tech.- Biotechnology (Total Credits-100)

Programme Structure-2020

FIRST SEMESTER

Course Code	Course Title	Lectures (L) Hours Per Week	Tutorial (T) Hours Per Week	Practical (P) Hours Per Week	Total Credits
BTE4101	Biochemistry & Metabolic Regulation	2	-	-	2
BTE4102	Genetics & Molecular Biology	3	-	-	3
BTE4103	Instrumentation & Research Methodology	2	-	-	2
BTE4104	Microbial Technology	2	-	-	2
BTE4105	Biostatistics	2	-	-	2
BTE4106	Biochemistry & Metabolic Regulation Lab	-	-	2	1
BTE4107	Genetics & Molecular Biology Lab	-	-	4	2
BTE4108	Microbial Technology Lab	-	-	2	1
	Select any one paper of the following Electives with their lab				**3**
BTE4111 BTE4112	**Elective-I (Choose any one)** Animal Biotechnology Plant Cell, Tissue & Organ Culture	2	-	-	2
BTE4113 BTE4114	**Elective-II (Choose any one)** Animal Biotechnology Lab Plant Cell, Tissue & Organ Culture Lab	-	-	2	1
	Open Electives				**5**
CSS4151	Basics of Communication	1	-	-	1
BEH4151	Self Development and Interpersonal Skills	1	-	-	1
LAN4151 LAN4152 LAN4153 LAN4154 LAN4155 LAN4156 LAN4157 LAN4158 LAN4159	Foreign Business Language – I French-I German-I Spanish-I Russian -I Chinese-I Portuguese-I Korean-I Japanese-I Hindi-I **	3	-	-	3
	TOTAL				**23**

** Hindi as Foreign Language for Foreign National Students

SECOND SEMESTER

Course Code	Course Title	Lectures (L) Hours Per Week	Tutorial (T) Hours Per Week	Practical (P) Hours Per Week	Total Credits
BTE4201	Recombinant DNA Technology	2	-	-	2
BTE4202	Bioinformatics & Computational Biology	2	-	-	2
BTE4203	Biochemical Engineering	2	-	-	2
BTE4204	Environmental Biotechnology	2	-	-	2
BTE4205	IPR & Bioethics	2	-	-	2
BTE4206	Molecular Cell Biology	3	-	-	3
BTE4207	Recombinant DNA Technology Lab	-	-	4	2
BTE4208	Bioinformatics & Computational Biology Lab	-	-	4	2
BTE4209	Environmental Biotechnology Lab	-	-	2	1
BTE4210	Molecular Cell Biology Lab	-	-	2	1
BTE4211	Immunology	2	-	-	2
BTE4212	Immunology Lab	-	-	4	2
BTE4231	Term Paper	-	-	-	1
	Open Electives				**5**
CSS4251	Corporate Communication	1	-	-	1
BEH4251	Behavioural Communication& Relationship Management	1	-	-	1
LAN4251 LAN4252 LAN4253 LAN4254 LAN4255 LAN4256 LAN4257 LAN4258 LAN4259	Foreign Business Language-II French-II German-II Spanish-II Russian -II Chinese-II Portuguese-II Korean-II Japanese-II Hindi-II	3	-	-	3
	TOTAL				**29**

THIRD SEMESTER

Course Code	Course Title	Lectures (L) Hours Per Week	Tutorial (T) Hours Per Week	Practical (P) Hours Per Week	Total Credits
BTE4301	Enzyme technology	2	-	-	2
BTE4302	Genomics & Proteomics	2	-	-	2
BTE4303	Structural Biology	2	-	-	2
BTE4304	Downstream Processing & Fermentation Biotechnology	2	-	-	2
BTE4305	Enzyme Technology Lab	-	-	4	2

Course Code	Course Title	L	T	P	Credits
BTE4306	Genomics & Proteomics Lab	-	-	4	2
BTE4307	Structural Biology Lab	-	-	2	1
BTE4308	Fermentation Biotechnology & Downstream Processing Lab	-	-	4	2
BTE4335	Summer Internship Evaluation	-	-	-	6
Electives (Select any One)					**3**
BTE4309	Industrial Management	3	-	-	3
BTE4310	Immunotechnology	3	-	-	3
BTE4311	Agri-Food Biotechnology	3	-	-	3
BTE4312	Biofuels & green technology	3	-	-	3
BTE4313	Stem Cells and Gene Therapy	3	-	-	3
BTE4314	Drug design & Pharmaceutical Biotechnology	3	-	-	3
BTE4315	Nanobiotechnology	3	-	-	3
BTE4316	New Generation Sequencing Analysis	3	-	-	3
BTE4317	Advanced Nanobiotechnology	3	-	-	3
Open Electives					**4**
CSS4351	Interpersonal Communication	1	-	-	1
BEH4351	Leading Through Teams	1	-	-	1
LAN4351 LAN4352 LAN4353 LAN4354 LAN4355 LAN4356 LAN4357 LAN4358 LAN4359	Foreign Business Language-III French-III German-III Spanish-III Russian -III Chinese-III Portuguese-III Korean-III Japanese-III Hindi-III	2	-	-	2
	TOTAL				**28**

FOURTH SEMESTER

Course Code	Course Title	Lectures (L) Hours Per Week	Tutorial (T) Hours Per Week	Practical (P) Hours Per Week	Total Credits
BTE4437	Dissertation / Project Report Presentation / Viva Voce	-	-	-	20
	TOTAL	-	-	-	**20**

131177 M.Sc. Data Science (Total Credits-100)

Programme Structure-2020

FIRST SEMESTER

Course Code	Course Title	Lectures (L) Hours Per Week	Tutorial (T) Hours Per Week	Practical (P) Hours Per Week	Total Credits
DSC4101	Introduction to Data Science	4	-	-	4
DSC4102	Machine Learning-I	3	-	-	3
DSC4103	Statistics & Exploratory Data Analysis	3	-	-	3
DSC4104	Database Management System-I	-	-	4	2
DSC4105	Programming Toolbox I-R	-	-	2	1
DSC4106	Programming ToolBox II- Python	-	-	2	1
DSC4107	Big Data Tools & Technologies-I	-	-	2	1
DSC4108	Introduction to Linux	-	-	2	1
DSC4109	Machine Learning-I Lab	-	-	2	1
DSC4110	Statistics & Exploratory Data Analysis Lab	-	-	2	1
Open Electives					**5**
CSS4151	Basics of Communication	1	-	-	1
BEH4151	Self Development and Interpersonal Skills	1	-	-	1
LAN4151 LAN4152 LAN4153 LAN4154 LAN4155 LAN4156 LAN4157 LAN4158 LAN4159	Foreign Business Language – I French-I German-I Spanish-I Russian -I Chinese-I Portuguese-I Korean-I Japanese-I Hindi-I **	3	-	-	3
	TOTAL				**23**

** Hindi as Foreign Language for Foreign National Students

SECOND SEMESTER

Course Code	Course Title	Lectures (L) Hours Per Week	Tutorial (T) Hours Per Week	Practical (P) Hours Per Week	Total Credits
DSC4201	Machine Learning-II	3	-	-	3

DSC4202	Regression Theory & Analysis	3	-	-	3
DSC4203	Data Structure & Algorithm Design	3	-	-	3
DSC4204	Database Management System-II	-	-	4	2
DSC4205	Spark	-	-	2	1
DSC4206	Data Visualization	-	-	2	1
DSC4207	Big Data Tools & Technologies-II	-	-	2	1
DSC4208	Machine Learning-II Lab	-	-	2	1
DSC4209	Regression Theory & Analysis Lab	-	-	2	1
DSC4210	Data Structure & Algorithm Design Lab	-	-	2	1
Electives (Choose any Two)					**2**
DSC4211	Pattern Recognition	-	-	2	1
DSC4212	Next Generation Sequencing Analysis	-	-	2	1
DSC4213	Association Rule Mining	-	-	2	1
Open Electives					**5**
CSS4251	Corporate Communication	1	-	-	1
BEH4251	Behavioural Communication & Relationship Management	1	-	-	1
LAN4251 LAN4252 LAN4253 LAN4254 LAN4255 LAN4256 LAN4257 LAN4258 LAN4259	Foreign Business Language-II French-II German-II Spanish-II Russian -II Chinese-II Portuguese-II Korean-II Japanese-II Hindi-II	3	-	-	3
	TOTAL				**24**

THIRD SEMESTER

Course Code	Course Title	Lectures (L) Hours Per Week	Tutorial (T) Hours Per Week	Practical (P) Hours Per Week	Total Credits
DSC4301	Generalized & Linear Modeling	3	-	-	3
DSC4302	Deep Learning & Neural Networks	3	-	-	3
DSC4303	Time Series	3	-	-	3
DSC4304	Graph & Social Network Analysis	3	-	-	3
DSC4305	Natural Language Processing	-	-	4	2
DSC4306	Graph & Social Network Analysis Lab	-	-	2	1
DSC4307	Big Data Tools & Technologies-III	-	-	2	1
DSC4308	Generalized & Linear Modeling Lab	-	-	2	1
DSC4309	Time Series Lab	-	-	2	1
DSC4310	Deep Learning & Neural Networks	-	-	2	1

Course Code	Course Title	Lectures (L) Hours Per Week	Tutorial (T) Hours Per Week	Practical (P) Hours Per Week	Total Credits
	Lab				
DSC4335	Summer Internship Evaluation	-	-	-	8
	Electives (Choose any Two)				**2**
DSC4311	Weather Prediction	-	-	2	1
DSC4312	Disease Classification	-	-	2	1
DSC4313	Customer Behaviour Analysis	-	-	2	1
	Open Electives				**4**
CSS4351	Interpersonal Communication	1	-	-	1
BEH4351	Leading Through Teams	1	-	-	1
LAN4351 LAN4352 LAN4353 LAN4354 LAN4355 LAN4356 LAN4357 LAN4358 LAN4359	Foreign Business Language-III French-III German-III Spanish-III Russian -III Chinese-III Portuguese-III Korean-III Japanese-III Hindi-III	2	-	-	2
	TOTAL				**33**

FOURTH SEMESTER

Course Code	Course Title	Lectures (L) Hours Per Week	Tutorial (T) Hours Per Week	Practical (P) Hours Per Week	Total Credits
DSC4437	Dissertation / Project Report Presentation / Viva Voce	-	-	-	20
	TOTAL	-	-	-	**20**

131345 Post Graduate Diploma in Data Science (Total Credits-55)

Programme Structure-2020

FIRST SEMESTER

Course Code	Course Title	Lectures (L) Hours Per Week	Tutorial (T) Hours Per Week	Practical (P) Hours Per Week	Total Credits
DSC3101	Introduction to Data Science	4	-	-	4
DSC3102	Machine Learning-I	3	-	-	3
DSC3103	Statistics & Exploratory Data Analysis	3	-	-	3
DSC3104	Database Management System-I	-	-	4	2
DSC3105	Programming Toolbox I-R	-	-	2	1
DSC3106	Programming ToolBox II- Python	-	-	2	1
DSC3107	Big Data Tools & Technologies-I	-	-	2	1
DSC3108	Introduction to Linux	-	-	2	1
DSC3109	Machine Learning-I Lab	-	-	2	1
DSC3110	Statistics & Exploratory Data Analysis Lab	-	-	2	1
Open Electives					**5**
CSS3151	Basics of Communication	1	-	-	1
BEH3151	Self Development and Interpersonal Skills	1	-	-	1
LAN3151 LAN3152 LAN3153 LAN3154 LAN3155 LAN3156 LAN3157 LAN3158 LAN3159	Foreign Business Language – I French-I German-I Spanish-I Russian -I Chinese-I Portuguese-I Korean-I Japanese-I Hindi-I **	3	-	-	3
TOTAL					**23**

** Hindi as Foreign Language for Foreign National Students

SECOND SEMESTER

Course Code	Course Title	Lectures (L) Hours Per Week	Tutorial (T) Hours Per Week	Practical (P) Hours Per Week	Total Credits
DSC3201	Machine Learning-II	3	-	-	3
DSC3202	Regression Theory & Analysis	3	-	-	3

DSC3203	Data Structure & Algorithm Design	3	-	-	3
DSC3204	Database Management System-II	-	-	4	2
DSC3205	Spark	-	-	2	1
DSC3206	Data Visualization	-	-	2	1
DSC3207	Big Data Tools & Technologies-II	-	-	2	1
DSC3208	Machine Learning-II Lab	-	-	2	1
DSC3209	Regression Theory & Analysis Lab	-	-	2	1
DSC3210	Data Structure & Algorithm Design Lab	-	-	2	1
DSC3237	Project	-	-	-	8
Electives (Choose any Two)					**2**
DSC3211	Pattern Recognition	-	-	2	1
DSC3212	Next Generation Sequencing Analysis	-	-	2	1
DSC3213	Association Rule Mining	-	-	2	1
Open Electives					**5**
CSS3251	Corporate Communication	1	-	-	1
BEH3251	Behavioural Communication & Relationship Management	1	-	-	1
LAN3251 LAN3252 LAN3253 LAN3254 LAN3255 LAN3256 LAN3257 LAN3258 LAN3259	Foreign Business Language-II French-II German-II Spanish-II Russian -II Chinese-II Portuguese-II Korean-II Japanese-II Hindi-II	3	-	-	3
	TOTAL				**32**