

# COURSE STRUCTURE

**B.TECH.**

**BIOTECHNOLOGY**



**Under**

**Choice Based Credit System (CBCS)**

**(W.E.F. Session 2024-25)**

## Credits Distributions

Sr. No.	Category	No. of Credits
1	Humanities and Social Sciences (HS)	25
2	Basic Sciences (BS)	20
3	Engineering Sciences (ES)	25
4	Professional Core (PC)	57
5	Professional Elective (PE)	26
6	Open Elective (OE)	16
7	Project Work (PW)	19
8	Mandatory Non Credit Courses (MNC) (4 Courses)	8U
<b>Total</b>		<b>188</b>

## First Semester

S. NO.	CODE	SUBJECT	TEACHING SCHEME			CREDITS	CONTACTS HRS/WK
			L	T	P		
1.	BMAS 0130 BBTS 0001	Elementary Mathematics-I/ Introduction to Biology	3	1	0	4	4
2.	BCHS0101	Engineering Chemistry	3	1	0	4	4
3.	BELH0001	English Language skill for communication-I	2	0	0	2	2
4.	BBTC0001	Cell Biology and Basic genetics	3		0	3	3
5.	BCSG0002	Computer Programming	3	0	0	3	3
6.	BBTC1001	Introduction to Biomolecule	3	0	0	3	3
7.	BBTS1002	Introduction to Biotechnology	3	0	0	3	3
<b>PRACTICALS</b>							
8	BCHS0801	Engineering Chemistry Lab	0	0	2	1	2
9	BELH0801	English Language Lab -I	0	0	2	1	2
10	BBTC810	Cell Biology and Basic genetics Lab	0	0	2	1	2
11	BCSG0801	Computer programming Lab	0	0	2	1	2
12	BMEG0801	Engineering Drawing Lab	0	0	2	1	2
		<b>TOTAL</b>	<b>18</b>	<b>2</b>	<b>12</b>	<b>27</b>	<b>29</b>

## Second Semester

S. NO.	CODE	SUBJECT	TEACHING SCHEME			CREDITS	CONTACTS HRS/WK
			L	T	P		
1.	BBTC 1003	Bio Statistics	3	0	0	3	3
2.	BBTC1002	Biochemistry	3	0	0	3	3
3.	BBTC0002	Animal and Plant physiology	3	0	0	3	3
4.	BELH0002	English Language skill for communication-II	2	0	0	2	2
5.	BBTC0006	Bioanalytical techniques	3	0	0	3	3
6.	BBTC1004	Molecular Biology	3	0	0	3	3
	BCSG1001	Python Programming	3	0	0	3	3
<b>PRACTICALS</b>							
7	BBTC0802	Biochemistry lab	0	0	2	1	2
8	BELH0802	English Language Lab II	0	0	2	1	2
9	BBTC0812	Molecular Biology and Bioanalytical Technique Lab	0	0	2	1	2
11	BBTC0801	Animal and plant physiology Lab	0	0	2	1	2
	BCSG1800	Python Programming Lab	0	0	2	1	2
		<b>TOTAL</b>	<b>20</b>	<b>0</b>	<b>10</b>	<b>25</b>	<b>30</b>

## Program Core

S. NO.	CODE	SUBJECT	TEACHING SCHEME				CREDITS	CONTACT S HR/WK	PRE-REQUISITES
			L	T	P	J			
<b>THEORY</b>									
1.	BBTC 0001	Cell Biology and Basic genetics	3	0	0	0	3	3	
2.	BBTC 1002	Biochemistry	3	0	0	0	3	3	
3.	BBTC1003	Industrial Biotechnology	3	0	0	0	3	3	
4.	BBTC 0006	Bioanalytical techniques	3	1	0	0	4	4	
5.	BBTC 0007	Microbiology	3	0	0	0	3	3	
6.	BBTC 0008	Molecular Biology	3	0	0	0	3	3	
7.	BBTC 0009	Recombinant DNA Technology	3	0	0	0	3	3	
8.	BBTC 0010	Immunology	3	1	0	0	4	4	
9.	BBTC 0011	Biochemical and Bioprocess Engineering	3	0	0	0	3	3	
10.	BBTC 0012	Genomics and Proteomics	3	1	0	0	4	4	
11.	BBTC 0013	Animal Biotechnology	3	0	0	0	3	3	
12.	BBTC 0014	Plant Biotechnology	3	0	0	0	3	3	
13.	BBTC 0015	Bioethics and IPR	3	0	0	0	3	3	
14.	BBTC1004	Bioinformatics	3	0	0	0	3	3	
15.	BBTC1001	Introduction to Biomolecule	3	0	0	0	3	3	
<b>PRACTICALS</b>									
14.	BBTC 0802	Biochemistry Lab	0	0	2	0	1	2	
15.	BBTC 0803	Molecular Biology and Bioanalytical techniques Lab	0	0	2	0	1	2	
16.	BBTC 0815	Microbiology Lab	0	0	2	0	1	2	
17..	BBTC 0805	Recombinant DNA Technology Lab	0	0	2	0	1	2	
18.	BBTC 0806	Animal Biotechnology Lab	0	0	2	0	1	2	
19.	BBTC0807	Plant Biotechnology Lab	0	0	2	0	1	2	
20.	BBTC0810	Cell Biology and Basic genetics Lab	0	0	2	0	1	2	
21.	BBTC0813	Bioinformatics Lab	0	0	2	0	1	2	
22.	BBTC0814	Immunology Lab	0	0	2	0	1	2	
<b>Total</b>			<b>39</b>	<b>3</b>	<b>16</b>	<b>0</b>	<b>57</b>	<b>62</b>	

## Program Elective

S. NO.	CODE	SUBJECT	TEACHING SCHEME				CREDITS	CONTACTS HR/AWK	PRE- REQUISITES
			L	T	P	J			
<b>Bouquet: Genetic Engineering</b>									
<b>THEORY</b>									
1.	BBTE0006	Nano-biotechnology	3	0	0	0	3	3	
2.	BBTE0007	Microbial Biotechnology	3	0	0	0	3	3	
3.	BBTE0008	Protein Engineering	3	0	0	0	3	3	
		Metabolic Engineering	3	0	0	0	3	3	
<b>PRACTICALS</b>									
4.	BBTE0813	Nano-biotechnology Lab	0	0	2	0	1	2	
5.	BBTE0814	Microbial Biotechnology Lab	0	0	2	0	1	2	

## Program Elective

S. NO.	CODE	SUBJECT	TEACHING SCHEME				CREDITS	CONTACTS HR/AWK	PRE- REQUISITES
			L	T	P	J			
<b>Bouquet: Medical &amp; pharmaceutical Biotechnology</b>									
<b>THEORY</b>									
1.	BBTE0008	Gene and Stem cell therapy	3	0	0	0	3	3	
2.	BBTE0009	Molecular diagnostics	3	0	0	0	3	3	
3.	BBTE0010	Virology and Cancer Biology	3	0	0	0	3	3	
4.		Pharmacogenomics and drug development							
<b>PRACTICALS</b>									
5.		Virology and Cancer Biology Lab	0	0	2	0	1	2	

6.	BBTE0815	Molecular Diagnostics Lab	0	0	2	0	1	2	
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## Program Elective

S. NO.	CODE	SUBJECT	TEACHING SCHEME			CREDITS	ACTS HR/W	PRE-REQUISITES
			L	T	P			
<b>Bouquet: INDUSTRIAL BIOTECHNOLOGY</b>								
<b>THEORY</b>								
1.	BBTE0012	Industrial Enzymology	3	0	0	0	3	3
2.	BBTE0013	Food Biotechnology	3	0	0	0	3	3
3.	BBTE0014	Industrial Waste Management	3	0	0	0	3	3
4.	BBTE0015	Fermenter and Bioreactor Designing	3	0	0	0	3	3
5.	BBTE0016	Downstream Processing	3	0	0	0	3	3
6.	BBTE0017	Biopharmaceuticals	3	0	0	0	3	3
<b>PRACTICALS</b>								
7.	BBTE0816	Fermenter, Bioreactor designing and Downstream Processing Lab	0	0	2	0	1	2
8.	BBTE0817	Food and Industrial Enzymology Lab	0	0	2	0	1	2
9.	BBTE0818	Biopharmaceutical and Industrial waste management Lab	0	0	2	0	1	2

## Program Elective

S. NO.	CODE	SUBJECT	TEACHING SCHEME				CREDITS	CONTACTS HR/WK	PRE-REQUISITES
			L	T	P	J			
<b>Bouquet: BIOINFORMATICS</b>									
<b>THEORY</b>									
1.	BBTE0001	Computer Aided Drug Designing	3	0	0	0	3	3	
2.	BBTE0002	Algorithms for Bioinformatics	3	0	0	0	3	3	
3.	BBTE0003	Computational Molecular Biology	3	0	0	0	3	3	
4.	BBTE0004	Biological Data Mining	3	0	0	0	3	3	
<b>PRACTICALS</b>									
5.	BBTE0810	Computer Aided Drug Designing Lab	0	0	2	0	1	2	
6.	BBTE0811	Computational Molecular Biology Lab	0	0	2	0	1	2	
7.	BBTE0819	Algorithms for Bioinformatics Lb	0	0	2	0	1	2	

## Program Elective

S. NO.	CODE	SUBJECT	TEACHING SCHEME				CREDITS	CONTACTS HR/WK	PRE-REQUISITES
			L	T	P	J			
<b>Bouquet: COMPUTER AND INFORMATION TECHNOLOGY</b>									
<b>THEORY</b>									
1.	BCSO0001	Data Structures & Application	3	0	0	0	3	3	
2.	BCSO0003	Essentials of Information Technology	3	0	0	0	3	3	
3.	BCSE0105	Machine Learning	3	0	0	0	3	3	
5.	BCSE0157	Natural Language Processing	3	0	0	0	3	3	
<b>PRACTICALS</b>									
6	BCSO0070	Data Structures & Application Lab	0	0	2	0	1	2	
7	BCSO0072	Information Technology lab	0	0	2	0	1	2	
9.	BCSE0133	Machine Learning Lab	0	0	2	0	1	2	



## Humanities and Social Sciences

S. NO.	CODE	SUBJECT	TEACHING SCHEME				CREDITS	CONTACT S HR/WK	PRE- REQUISITES
			L	T	P	J			
<b>THEORY</b>									
1.	BELH0001	English Language Skills for Communication - I	2	0	0	0	2	2	
2.	BELH0002	English Language Skills for Communication - II	2	0	0	0	2	2	
3.	BELH0003	English for Professional Purposes - I	2	0	0	0	2	2	
4.	BELH0004	English for Professional Purposes - II	2	0	0	0	2	2	
5.	BELH0006	Ethics & Values	2	0	0	0	2	2	
6.	MBAH0005	Industrial Management	3	0	0	0	3	3	
<b>PRACTICALS</b>									
1.	BELH0801	English Language Lab - I	0	0	2	0	1	2	
2.	BELH0802	English Language Lab - II	0	0	2	0	1	2	
3.	BTDH0301	Soft Skills - I	0	0	2	0	1	2	
4.	BTDH0302	Soft Skills - II	0	0	2	0	1	2	
5.	BTDH0303	Soft Skills - III	0	0	8	0	4	8	
6.	BTDH0304	Soft Skills - IV	0	0	8	0	4	8	
<b>TOTAL</b>			<b>13</b>	<b>0</b>	<b>24</b>	<b>0</b>	<b>25</b>	<b>37</b>	

## Basic Sciences

S. NO.	CODE	SUBJECT	TEACHING SCHEME				CREDITS	CONTACT S HR/WK	PRE- REQUISITES
			L	T	P	J			
<b>THEORY</b>									
1.	DHM100/ BBTC0001	Applied Mathematics - I/ Introduction to Biology	3	1	0	0	4	4	
2.	BMAS0501	Biostatistics	3	1	0	0	4	4	
3.	BCHS0101	Engineering Chemistry	3	1	0	0	4	4	
4.	BCHS0201	Environmental Studies	3	0	0	0	3	3	
5.	BBTS0002	Introduction to Biotechnology	3	0	0	0	4	4	
<b>PRACTICALS</b>									
6..	BCHS0801	Engineering Chemistry Lab	0	0	2	0	1	2	
<b>TOTAL</b>			<b>12</b>	<b>3</b>	<b>2</b>	<b>0</b>	<b>20</b>	<b>20</b>	

## Engineering Sciences

S. NO.	CODE	SUBJECT	TEACHING SCHEME				CREDITS	CONTACTS HR/WK
			L	T	P	J		
<b>THEORY</b>								
1.	BMEC 0005	Fluid Mechanics	3	0	0	0	3	3
2.	BCSO0003	Essentials of Information Technology	3	0	0	0	3	3
3.	BCSG0002	Computer Programming	3	0	0	0	3	3
4.	BCSG1001	Python programming	3	0	0	0	3	3
5.	BCSC0006	Data Structures and Algorithms	3	0	0	0	3	3
6.	BBTC0002	Animal and Plant physiology	3	0	0	0	3	3
6.	BMEC 0803	Fluid Mechanics Lab	0	0	2	0	1	2
7.	BCSO0072	Essentials of Information Technology Lab	0	0	2	0	1	2
8.	BCSG0801	Computer Programming Lab	0	0	2	0	1	2
9.	BCSC0805	Data Structures and Algorithms Lab	0	0	2	0	1	2
10.	BMEG0801	Engineering Drawing Lab	0	0	2	0	1	2
11,	BCSG1800	Python programming Lab	0	0	2	0	1	2
	BCSE0132	Soft Computing Lab	0	0	2	0	1	2
<b>Total</b>			<b>15</b>	<b>1</b>	<b>12</b>	<b>0</b>	<b>25</b>	<b>32</b>

## Projects

S. NO.	CODE	SUBJECT	TEACHING SCHEME				CREDITS	CONTACTS HR/WK	PRE- REQUISITES
			L	T	P	J			
	APFJ0001	Field Project	0	0	0	1	1	0	
1.	BBTJ001	Mini Project - I	0	0	0	0	2	0	
2.	BBTJ002	Mini Project - II	0	0	0	0	2	0	
5.	BBTJ0801	Six Months Project Training	0	0	0	0	14	0	

## Mandatory Non Graded Course

S. NO.	CODE	SUBJECT	TEACHING SCHEME				CREDITS	CONTACTS HR/WK	PRE- REQUISITES
			L	T	P	J			
<b>THEORY</b>									
1.	BCSM0001	Introduction to Cyber Security	2	0	0	0	0	2	
2.	BCHM0101	Disaster Management	2	0	0	0	0	2	
3.	MBAM0001	Basic Course in Entrepreneurship	2	0	0	0	0	2	
4.	MBAM0002	Leadership And Organizational Behavior	2	0	0	0	0	2	