

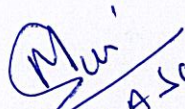
Proposed Scheme of Syllabus for UG degree in B.Tech.Biotechnology

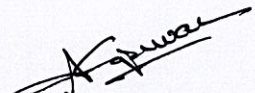
Submitted to

RTMNU, Nagpur

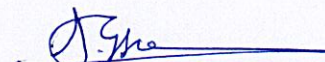
By

Board of B.Tech.Biotechnology


Dr. M. A. Soni


Dr. A. P. Kopolwar


Dr. V. P. Bhargava
Nagpur
3/17


Dr. S. G. Suke


Dr. S. G. Hade


(Dr. A. B. Ingole)


Dr. D. N. Begde

SCHEME OF EXAMINATION FOR B. TECH (BIOTECHNOLOGY))
FIRST SEMESTER B. TECH (BIOTECHNOLOGY)

FIRST SEMESTER B. TECH (BIOTECHNOLOGY)																
Sr. No.	Code Theory (T) Practical (P)	Subject	Board	Work Load (Hours)				Credit				Marks				Total Marks
				L	P	T	Total	L	P	T	Total	Theory		Practical		
												College Assessment	University	College Assessment	University	
1	BT -BSC -101T	Maths I	BGE	2	0	0	2	2	-	0	2	15	35	-	-	50
2	BT - BSC -102 T	Physics	BGE	2	--	0	2	2	-	0	2	15	35	-	-	50
3	BT - BSC -103 T	Chemistry-I	BGE	2	--	0	2	2	-	0	2	15	35	-	-	50
4	BT - BSC -104 T	Fundamentals of Reaction Mechanism	BGE	2	--	0	2	2	-	0	2	15	35	-	-	50
5	BT - GES -105 T	Engineering & Solid Mechanics	BGE	3	--	0	3	3	-	0	3	30	70	-	-	100
6	BT -HS -106 T	Communication Skill	BGE	2	-	0	2	-	-	0	Audit	50	--	-	-	50
7	BT - BSC -107 P	Physics Laboratory	BGE	0	2	0	2	0	1	-	1	-	-	25	25	50
8	BT - BSC -108 P	Chemistry I Laboratory	BGE	0	2	0	2	0	1	-	1	-	-	25	25	50
9	BT - BSC -109 P	Fundamentals of Reaction Mechanism Laboratory	BGE	0	2	0	2	0	1	-	1	-	-	25	25	50
10	BT -GES -110 P	Engineering & Solid Mechanics Laboratory	BGE	0	3	0	3	0	1.5	-	1.5	-	-	25	25	50
11	BT -HS -111 P	Communication Skill Laboratory	BGE	0	2	0	2	0	1	-	1	-	-	25	25	50
		Total		13	11	0	24	11	5.5	0	16.5	140	210	125	125	600

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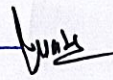
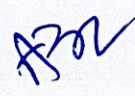
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SCHEME OF EXAMINATION FOR B. TECH (BIOTECHNOLOGY)
SECOND SEMESTER B. TECH (BIOTECHNOLOGY)

Sr. No.	Code Theory (T) Practical (P)	Subject	Board	Work Load (Hours)				Credit				Marks						Total Marks
				L	P	T	Total	L	P	T	Total	Theory		Practical				
												College Assessment	University	College Assessment	University			
1	BT -BSC -201T	Maths II	BGE	3	0	0	3	3	0	0	3	30	70	-	-	100		
2	BT - BSC -202 T	Properties of Matter	BGE	2	-	0	2	2	0	0	2	15	35	-	-	50		
3	BT - BSC -203 T	Chemistry-II	BGE	2	-	0	2	2	0	0	2	15	35	-	-	50		
4	BT -BSC -204 T	Organic Process Technology	BGE	2	-	0	2	2	0	0	2	15	35	-	-	50		
5	BT -GES -205 T	Thermodynamics I	BGE	3	0	0	3	3	0	0	3	30	70	-	-	100		
6	BT -GES -206 T	Electrical & Electronics Engineering	BGE	3	-	0	3	3	0	0	3	30	70	-	-	100		
7	BT - BSC -207 P	Properties of Matter Laboratory	BGE	0	2	0	2	0	1	0	1	-	-	25	25	50		
8	BT- BSC -208 P	Chemistry -II Laboratory	BGE	0	2	0	2	0	1	0	1	-	-	25	25	50		
9	BT- BSC -209 P	Organic Process Technology Laboratory	BGE	0	3	0	3	0	1.5	0	1.5	-	-	25	25	50		
10	BT-GES -210 P	Electrical & Electronics Engineering Laboratory	BGE	0	2	0	2	0	1	0	1	-	-	25	25	50		
11.	BT -GES -211P	Engineering. Graphics	BGE	0	3	0	3	0	1.5	-	1.5	-	-	25	25	50		
		Total		15	12	0	27	15	6	0	21	135	315	125	125	700		



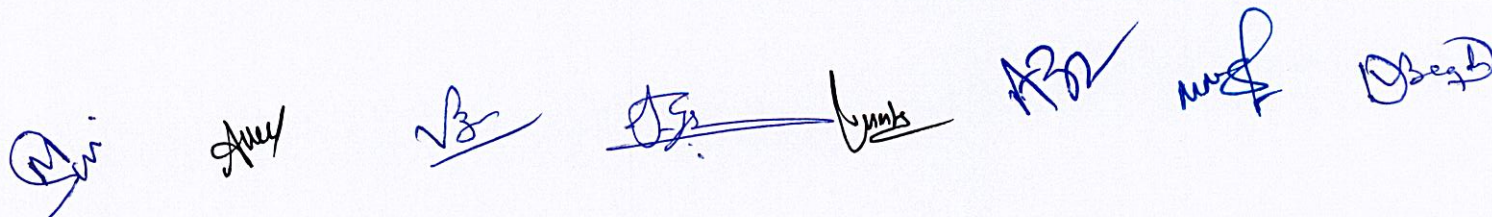




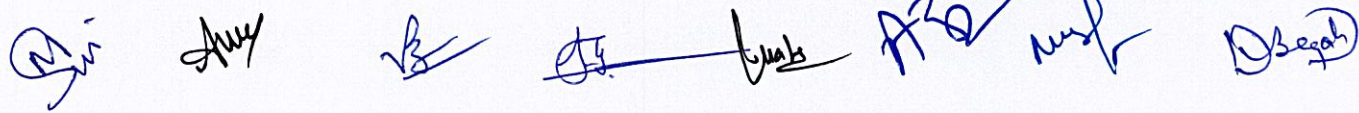
PROPOSED SCHEME OF EXAMINATION FOR B. TECH (BIOTECHNOLOGY)
THIRD SEMESTER B. TECH (BIOTECHNOLOGY)

THIRD SEMESTER B. TECH (BIOTECHNOLOGY)																	
Sr. No.	Code Theory (T) Practica l (P)	Subject	Board	Work Load (Hours)				Credit				Marks				Total Marks	Min. % Marks Required for passing
				L	P	T	Tot al	L	P	T	Total	Theory		Practical			
												College Assess- ment	Univer sity	College Assess- ment	University		
1	BT -HS -301T	Effective Technical Communication	BGE	2	0	0	2	2	0	0	2	15	35	-	-	50	45%
2	BT - BS -302 T	Biochemistry	BBT	3	0	0	3	3	0	0	3	30	70	-	-	100	45%
3	BT - BS -303 T	Microbiology	BBT	3	0	0	3	3	0	0	3	30	70	-	-	100	45%
4	BT -PC -304 T	Bioprocess Calculations	BBT	2	0	1	3	2	0	1	3	30	70	-	-	100	45%
5	BT -PC -305 T	Analytical Techniques	BBT	3	0	0	3	3	0	0	3	30	70	-	-	100	45%
6	BT -BS -306 P	Biochemistry Laboratory	BBT	0	3	0	3	0	1.5	0	1.5	-	-	25	25	50	50%
7	BT - BS -307 P	Microbiology Laboratory	BBT	0	3	0	3	0	1.5	0	1.5	-	-	25	25	50	50%
8	BT - PC -308 P	Analytical Techniques Laboratory	BBT	0	3	0	3	0	1.5	0	1.5	-	-	25	25	50	50%
9	BT- PS -309 P	Technical Seminar	BBT	0	2	0	2	0	1	0	1	-	-	100	-	100	50%
		Total		13	11	1	25	13	6.5	1	19.5	135	315	175	75	700	



PROPOSED SCHEME OF EXAMINATION FOR B. TECH (BIOTECHNOLOGY)
FOURTH SEMESTER B. TECH (BIOTECHNOLOGY)

FOURTH SEMESTER B. TECH (BIOTECHNOLOGY)																		
Sr. No.	Code Theory (T) Practical (P)	Subject	Boa rd	Work Load (Hours)				Credit				Marks				Total Marks	Min. % Marks Required for passing	
				L	P	T	Tot al	L	P	T	Total	Theory		Practical				
												College Assess- ment	University	College Assessm- ent	University			
1	BT -BS - 401 T	Cell and molecular biology	BBT	3	0	0	3	3	0	0	3	30	70	-	-	100	45%	
2	BT-PC - 402 T	Green Biotechnology and Pollution Abetment	BBT	3	0	0	3	3	0	0	3	30	70	-	-	100	45%	
3	BT -BS - 403 T	Biochemistry Metabolism	BBT	3	0	0	3	3	0	0	3	30	70	-	-	100	45%	
4	BT -PC - 404 T	Bioinformatics and Computational Biology	BBT	2	0	1	3	2	0	1	3	30	70	-	-	100	45%	
5	BT -AU - 405 T	Environmental Science	BBT	2	0	0	2	0	0	0	Audit	50	-	-	-	50	-	
6	BT -HS - 406 T	Engineering Economics	BGE	2	0	0	2	2	0	0	2	15	35	-	-	50	45%	
7	BT -BS - 407 P	Cell and molecular biology Laboratory	BBT	0	3	0	3	0	1.5	0	1.5	-	-	25	25	50	50%	
8	BT -BS - 408 P	Biochemistry Metabolism Laboratory	BBT	0	3	0	3	0	1.5	0	1.5	-	-	25	25	50	50%	
9	BT -PC - 409 P	Bioinformatics and Computational Biology Laboratory	BBT	0	2	0	2	0	1	0	1	-	-	25	25	50	50%	
		Total		15	8	1	24	13	4	1	18	185	315	75	75	650		



PROPOSED SCHEME OF EXAMINATION FOR B. TECH (BIOTECHNOLOGY)
FIFTH SEMESTER B. TECH (BIOTECHNOLOGY)

FIFTH SEMESTER B. TECH (BIOTECHNOLOGY)																	
Sr. No	Code Theory (T) Practical (P)	Subject	Board	Work Load (Hours)				Credit				Marks				Total Marks	Min. % Marks Required for passing
				L	P	T	Total	L	P	T	Total	Theory		Practical			
												College Assessment	University	College Assessment	University		
1	BT -HS - 501 T	Entrepreneurship and Startups	BGE	1	0	1	2	1	0	1	2	15	35	-	-	50	45%
2	BT -PC - 502 T	Immunology & Immunotechnology	BBT	3	0	0	3	3	0	0	3	30	70	-	-	100	45%
3	BT -PC - 503 T	Genetic Engineering and rDNA Technology	BBT	3	0	0	3	3	0	0	3	30	70	-	-	100	45%
4	BT -PC - 504 T	Fluid Mechanics and Solid Handling	BBT	2	0	1	3	2	0	1	3	30	70	-	-	100	45%
5	BT -PE - 505 T	Professional Elective-I	BBT	3	0	1	4	3	0	1	4	30	70	-	-	100	45%
6	BT -OS - 506 T	Open Subject-I	BBT	3	0	1	4	3	0	1	4	30	70	-	-	100	45%
7	BT -AU - 507 T	Indian Constitution	BGE	2	0	0	2	0	0	0	Audit	50	-	-	-	50	-
8	BT -PC - 504 T	Immunology & Immunotechnology Laboratory	BBT	0	3	0	3	0	1.5	0	1.5	-	-	25	25	50	50%
9	BT -PC - 504 T	Genetics & rDNA Technology Laboratory	BBT	0	3	0	3	0	1.5	0	1.5	-	-	25	25	50	50%
		Total		17	6	4	27	16	3	4	22	160	440	50	50	700	

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Professional Elective-I

List of available courses under Professional Elective – I	
S. No.	Course
1	Big Data Analytics
2	Advanced Bioprocess Control
3	Biosimilars Technology

Open Subject-I

List of available courses under Open Subject – I	
S. No.	Course Title
1	3D Printing & Design
2	Internet of Things
3	Cheminformatics & Medicinal Chemistry
4	Biomaterials
5	Green Economy and Sustainability

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PROPOSED SCHEME OF EXAMINATION FOR B. TECH (BIOTECHNOLOGY)
SIXTH SEMESTER B. TECH (BIOTECHNOLOGY)

Sr. No.	Code Theory (T) Practical (P)	Subject	Boar d	Work Load (Hours)				Credit				Marks				Total Marks	Min. % Marks Required for passing
				L	P	T	Total	L	P	T	Total	Theory		Practical			
												College Assessment	University	College Assessment	University		
1	BT -PC - 601 T	Bioseparation Engineering	BBT	3	0	0	3	3	0	0	3	30	70	-	-	100	45%
2	BT -PC - 602 T	Mass Transfer In Biotechnology	BBT	3	0	0	3	3	0	0	3	30	70	-	-	100	45%
3	BT -PC - 603 T	Bioprocess Engineering	BBT	2	0	1	3	2	0	1	3	30	70	-	-	100	45%
4	BT -PC - 604 T	Plant Tissue culture Technology	BBT	3	0	0	3	3	0	0	3	30	70	-	-	100	45%
5	BT -PE - 605 T	Professional Elective-II	BBT	3	0	1	4	3	0	1	4	30	70	-	-	100	45%
6	BT -OS - 606 T	Open Subject-II	BBT	3	0	1	4	3	0	1	4	30	70	-	-	100	45%
7	BT-AU- 607 T	Sports and Yoga	BBT	2	0	0	2	0	0	0	Audit	50	-	-	-	50	-
8	BT -PC - 608 P	Mass Transfer In Biotechnology Laboratory	BBT	0	3	0	3	0	1.5	0	1.5	-	-	25	25	50	50%
9	BT -PC - 609 P	Bioprocess Engineering Laboratory	BBT	0	2	0	2	0	1	0	1	-	-	25	25	50	50%
10	BT -PC - 610 P	Plant Tissue culture Technology Laboratory	BBT	0	3	0	3	0	1.5	0	1.5	-	-	25	25	50	50%
		Total		19	8	3	30	18	4	3	24	120	480	75	75	800	

M. J. J.

B.

S. J. J.

A. J. J.

D. J. J.

Professional Elective-II

List of available courses under Professional Elective – II	
S. No.	Course Title
1	Machine Learning
2	Waste Management
3	Stem-Cell Technology

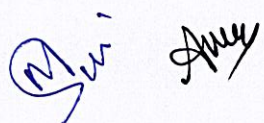
Open Subject-II

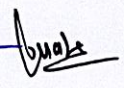
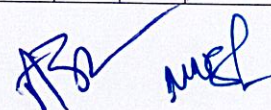
List of available courses under Open Subject – II	
S. No.	Course Title
1	Artificial Intelligence
2	Synthetic & Systems Biology
3	Good Manufacturing and Laboratory Practice
4	Heat Transfer in Biotechnology
5	Environment and Sustainability

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PROPOSED SCHEME OF EXAMINATION FOR B. TECH (BIOTECHNOLOGY)
SEVENTH SEMESTER B. TECH (BIOTECHNOLOGY)

Sr. No.	Code Theory (T) Practic al (P)	Subject	Boar d	Work Load (Hours)				Credit				Marks				Total Marks	Min. % Marks Require d for passing
				L	P	T	Tot al	L	P	T	Total	Theory		Practical			
												College Assessme nt	Universit y	College Assessment	University		
1	BT -PC -701 T	Intellectual Property Rights (IPR) & Regulatory	BBT	2	0	0	2	2	0	0	2	15	35	-	-	50	45%
2	BT -PC -702 T	Data analysis and Simulations	BBT	3	0	1	4	3	0	1	4	30	70	-	-	100	45%
3	BT -PE -703 T	Professional Elective-III	BBT	3	0	1	4	3	0	1	4	30	70	-	-	100	45%
4	BT -PE -704 T	Professional Elective-IV	BBT	3	0	1	4	3	0	1	4	30	70	-	-	100	45%
5	BT -OS-705T	Open Subject-III	BBT	3	0	0	3	3	0	0	3	30	70	-	-	100	45%
6	BT -PC -706P	Data analysis and Simulations Laboratory	BBT	0	2	0	2	0	1	0	1	-	-	25	25	50	50%
7	BT -PS -707 P	Project-I	BBT	0	6	0	6	0	3	0	3	-	-	100	-	100	50%
8	BT -PS -708 P	Summer Internship	BBT	0	6	0	6	0	3	0	3	-	-	100	-	100	50%
		Total		14	14	3	31	14	7	3	24	135	315	225	25	700	




Professional Elective-III

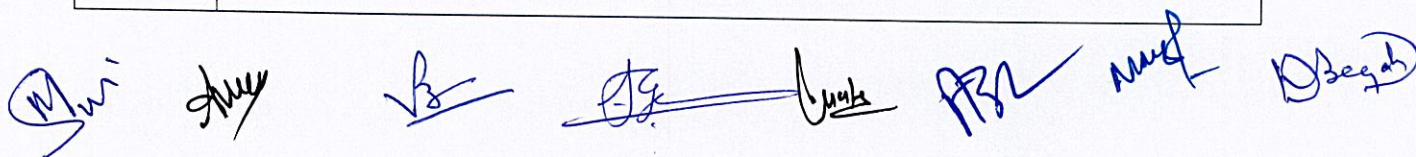
List of available courses under Professional Elective – III	
S. No.	Course Title
1	Gene Expression and Transgenic
2	Bioprocess Equipment Design
3	Animal Tissue Culture Technology

Professional Elective-IV

List of available courses under Professional Elective – IV	
S. No.	Course Title
1	Precision Medicine & Wellness
2	Cryogenic Application in Biotechnology
3	Renewable Energy

Open Subject-III

List of available courses under Open Subject – III	
S. No.	Course Title
1	Virtual Reality
2	Bioterrorism and National Security
3	Data Sciences

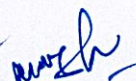
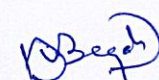


PROPOSED SCHEME OF EXAMINATION FOR B. TECH (BIOTECHNOLOGY)
EIGHTH SEMESTER B. TECH (BIOTECHNOLOGY)

Sr. No.	Code Theory (T) Practical (P)	Subject	Boar d	Work Load (Hours)				Credit			Marks						Total Marks	Min. % Marks Require d for passing
				L	P	T	Tota l	L	P	T	Tota l	Theory		Practical				
												College Assessm ent	University	College Assessme nt	University			
1	BT -PE -801 T	Professional Elective-V	BBT	3	0	1	4	3	0	1	4	30	70	-	-	100	45%	
2	BT -OS- 802 T	Open Subject-IV	BBT	3	0	-	3	3	0	0	3	30	70	-	-	100	45%	
3	BT -PS -803 P	Project-II (Biotech Industrial or Biotech In-house Project or Bio-Entrepreneurship/startups)	BBT	0	16	0	16	0	8	0	8	-	-	100	100	200	50%	
		Total		6	16	1	23	6	8	1	15	60	140	100	100	400		





Professional Elective-V

List of available courses under Professional Elective – IV	
S. No.	Course Title
1	Fermentation Technology
2	Rational Drug Discovery
3	Nano Biotechnology

Open Subject-IV

List of available courses under Open Subject – IV	
S. No.	Course Title
1	Food and Nutrition Technology
2	Research methodology and Scientific writing
3	Design Thinking

Mini
Dr M A somi

Amey

VB

Dr. S. G. Suke

Amal

ABN
Amel

DBest