

Semester III

S.No.	Course/ Credits	Subject Code	Course Title	Hours/Week	Credit
1.	DSC	DSC-I.3BT	Genetic Engineering	3	3
2.	DSC	DSC-II.3BT	Bioprocess Engineering & Technology	3	3
3.	DSC	DSC-III.3BT	Bioinformatics and Computation Biology	3	3
4.	DSC-LC	DSC-LC-I.3BT	Genetic Engineering	6@	2
5.	DSC-LC	DSC-LC-II.3BT	Bioprocess Engineering & Technology	6*	1.5
6.	DSC-LC	DSC-LC-III.3BT	Bioinformatics and Computation Biology	3	1.5
7.	DSE	DSE-I.3BT	Elective		2
8.	DSE	DSE-II.3BT	Elective		2
9.	RP	RP-3BT	Research Project	4	4
11.	Seminars			1	-
12.	Internal Assessment/ Evaluation			1	-
	Total				22

Note:

- * Practical 6Hours comprises 3 hours hands-on and 3 hours Preparation, incubation and observation.
- @ Practical 6Hours comprises 4 hours hands-on and 2 hours Preparation, incubation and observation.

DSE (Discipline Specific Elective)

DSE-A Cancer Biology; DSE-B Molecular Basis of Drug Discovery; DSE-C Clinical Trial & Research; DSE-D Phyto secondary Metabolites and its Bioactivity; DSE-E Nanobiotechnology; DSE-F DNA Fingerprinting, DSE-G Vaccines; DSE-H IPR

OEC (Optional) can be studied during semester I to IV

Semester IV

S.No.	Course/ Credits	Subject Code	Course Title	Hours/Week	Credit
1.	DSC	DSC-I.4BT	Animal Cell Science and Technology	3	3
2.	DSC	DSC-II.4BT	Industrial Biotechnology	3	3
3.	DSC	DSC-III.4BT	Environmental Biotechnology	3	3
4.	DSC-LC	DSC-LC-I.4BT	Animal Cell Science and Technology	6@	2
5.	DSC-LC	DSC-LC-II.4BT	Industrial Biotechnology	6*	1.5
6.	DSC-LC	DSC-LC-III.4BT	Environmental Biotechnology	6*	1.5
7.	DSE	DSE-I.4BT	Elective	2	2
8.	DSE	DSC-II.4BT	Elective	2	2
9.			Research Project	12	6
11.	Seminars			1	-
12.	Internal Assessment/ Evaluation			1	-
				45	24

Note:

- * Practical 6Hours comprises 3 hours hands-on and 3 hours Preparation, incubation and observation.
- @ Practical 6Hours comprises 4 hours hands-on and 2 hours Preparation, incubation and observation.

DSE (Discipline Specific Elective)

DSE-A Cancer Biology; DSE-B Molecular Basis of Drug Discovery; DSE-C Clinical Trial & Research; DSE-D Phyto secondary Metabolites and its Bioactivity; DSE-E Nanobiotechnology; DSE-F DNA Fingerprinting, DSE-G Vaccines; DSE-H IPR

OEC (Optional) can be studied during semester I to IV

Sant Gadge Baba Amravati University, Amravati

FACULTY :

Scheme of Teaching, Learning, Examination & Evaluation leading to Two Years PG Degree Master of Science (Biotechnology) following Three Years UG Programme wef 2023-24 (Two Years- Four Semesters Master's Degree Programme- NEPv23 with Exit and Entry Option

M. Sc. (Biotechnology) First Year Semester- I

S. N.	Subject	Type of Course	Subject Code	Teaching & Learning Scheme							Duration Of Exam Hours	Examination & Evaluation Scheme							
				Teaching Period Per Week				Credits				Maximum Marks					Minimum Passing		
				L	T	P	Total	L/T	Practical	Total		Theory		Practical		Total Marks			
												Theory Internal	Theory External	Internal	External		Marks Internal	Marks External	Grade
1	Research Methodology – I	Th-Major	RM-I,1 BT	2			2	2		2	1.5	50				50	20		P
2	Research Methodology - II Classic Discoveries	Th-Major	RM-I.2	2			2	2		2	1.5	50				50	20		P
2	DSC-I.1 Biochemistry	Th-Major	DSC-I.1 BT	3			3	3		3	3	40	60			100	12	28	P
3	DSC-II.1 Cell Biology	Th-Major	DSC-II.1	3			3	3		3	3	40	60			100	12	28	P
	DSC-III.1 Molecular Biology	Th-Major	DSC-III.1 BT	3			3	3		3	3	40	60			100	12	28	P
4	DSE-I.1 /MOOC	Th-Major Elective	DSE-I.1BT	2			2	2		2	1.5	50				50	20		P
	DSE-II.1 /MOOC	Th-Major Elective	DSC-II.1BT	2			2	2		2	1.5	50				50	20		P
5	DSC-I.1 Lab - Biochemistry and Analytical Techniques	Pr-Major	DSC-LC-I.1 BT			6*	6*		1.5	5	12			50	50	100	50		P

6	DSC-II.1 Lab Cell Biology	Pr-Major	DSC-LC-II-1 BT			6*	6*		1.5										
6	DSC-III.1 Lab Molecular Biology	Pr-Major	DSC-LC-III. 1BT			6@	6@		2										
8	# On Job Training, Internship/ Apprenticeship; Field projects Related to Major @ during vacations cumulatively	Related to DSC		120 Hours cumulatively during vacations of Semester I and Semester II						4**									P*
9	Co-curricular Courses: Health and wellness, Yoga Education, Sports and Fitness, Cultural Activities, NSS/NCC, Fine/Applied/Visual/Performing Arts During Semester I, II, III and IV	Generic Optional		90 Hours Cumulatively From Sem I to Sem IV															
TOTAL										23									600+50**

L: Lecture, T: Tutorial, P: Practical/Practicum

Pre-requisite Course mandatory if applicable: **Prq**, Theory : **Th**, Practical/Practicum: **Pr**, Faculty Specific Core: **FSC**, Discipline Specific Core: **DSC**, Discipline Specific Elective: **DSE**, Laboratory: **Lab**, **OJT**: On Job Training: Internship/ Apprenticeship; Field projects: **FP**; **RM**: Research Methodology; Research Project: **RP**, **Co-curricular Courses: CC**

Note :

* Practical 6 Hours comprises 3 hours hands-on and 3 hours Preparation, incubation and observation. 2. @ Practical 6 Hours comprises 4 hours hands-on and 2 hours Preparation, incubation and observation.

On Job Training, Internship/ Apprenticeship; Field projects **Related to Major (During vacations of Semester I and Semester II) for duration of 120 hours mandatory to all the students, to be completed during vacations of Semester I and/or II. This will carry 4 Credits for learning of 120 hours. Its credits and grades will be reflected in Semester II credit grade report.**

Note: **Co-curricular Courses:** In addition to the above, CC also include but not limited to Academic activities like paper presentations in conferences, Aavishkar, start-ups, Hackathon, Quiz competitions, Article published, Participation in Summer school/ Winter School / Short term course, Scientific Surveys, Societal Surveys, Field Visits, Study tours, Industrial Visits, online/offline Courses on Yoga (Yoga for IQ development, Yoga for Ego development, Yoga for Anger Management, Yoga for Eyesight Improvement, Yoga for Physical Stamina, Yoga for Stress Management, etc.). These can be completed cumulatively during **Semester I, II, III and IV. Its credits and grades will be reflected in semester IV credit grade report.**

Sant Gadge Baba Amravati University, Amravati

FACULTY :

Scheme of Teaching, Learning, Examination & Evaluation leading to Two Years PG Degree Master of Science (Biotechnology) following Three Years UG Programme wef 2023-24 (Two Years- Four Semesters Master's Degree Programme- NEPv23 with Exit and Entry Option**M. Sc. (Biotechnology) First Year- II [Level 6.0]**

S. N.	Subject	Type of Course	Subject Code	Teaching & Learning Scheme							Duration Of Exam Hours	Examination & Evaluation Scheme							
				Teaching Period Per Week				Credits				Maximum Marks					Minimum Passing		
				L	T	P	Total	L/T	Practical	Total		Theory		Practical		Total Marks			
												Theory Internal	Theory External	Internal	External		Marks Internal	Marks External	Grade
1	DSC-I.2 Microbiology	Th-Major	DSC-I.2 BT	3			3	3		3	3	40	60			100	12	28	P
2	DSC-II.2 Immunology	Th-Major	DSC-II.2 BT	3			3	3		3	3	40	60			100	12	28	P
3	DSC-III.2 Plant Biotechnology	Th-Major	DSC-III.2 BT	3			3	3		3	3	40	60			100	12	28	P
4	DSE-I.2/MOOC	Th-Major	DSE-I.2 BT	2			2	2		2	1.5	50				50	20		P
5	DSE-II.2/MOOC	Th-Major	DSE-II.2 BT	2			2	2		2	1.5	50				50	20		P
5	DSC-I.2 Lab Microbiology	Pr-Major	DSC-LC-I.2BT			6@	6		2	5	12			50	50	100	50		P
6	DSC-II.2 Lab Immunology	Pr-Major	DSC-			6*	6		1.5										

			LC-II. 2BT															
7	DSC-III.2 Lab Plant Biotechnology	Pr-Major	DSC- LC-III. 2BT			6*	6		1.5									
9	# On Job Training, Internship/ Apprenticeship; Field projects Related to Major @ during vacations cumulatively	Related to Major		120 Hours cumulatively during vacations of Semester I and Semester II						4**								P*
8	Co-curricular Courses: Health and wellness, Yoga Education, Sports and Fitness, Cultural Activities, NSS/NCC, Fine/Applied/Visual/Performing Arts During Semester I, II, III and IV	Generic Optional		90 Hours Cumulatively From Sem I to Sem IV														
				Exit Option with a PG Diploma with 4 Credits On-the-job training/internship in the respective Major subject • Student has to earn Total minimum 4 Credits cumulatively during Vacations of Semester I and Semester II from internship in order to exit after First Year with PG Diploma (42-44 Credits) after Three Year UG Degree														
	TOTAL									19+4*							500	

L: Lecture, T: Tutorial, P: Practical/Practicum

Pre-requisite Course mandatory if applicable: **Prq**, Theory : **Th**, Practical/Practicum: **Pr**, Faculty Specific Core: **FSC**, Discipline Specific Core: **DSC**, Discipline Specific Elective: **DSE**, Laboratory: **Lab**, **OJT**: On Job Training; Internship/ Apprenticeship; Field projects: **FP**; **RM**: Research Methodology; Research Project: **RP**, **Co-curricular Courses: CC**

Note :* Practical 6 Hours comprises 3 hours hands-on and 3 hours Preparation, incubation and observation. 2. @ Practical 6 Hours comprises 4 hours hands-on and 2 hours Preparation, incubation and observation.

On Job Training, Internship/ Apprenticeship; Field projects **Related to Major (During vacations of Semester I and Semester II) for duration of 120 hours mandatory to all the students, to be completed during vacations of Semester I and/or II.**

This will carry 4 Credits for learning of 120 hours. Its credits and grades will be reflected in Semester II credit grade report.

Note: **Co-curricular Courses**: In addition to the above, CC also include but not limited to Academic activities like paper presentations in conferences, Aavishkar, start-ups, Hackathon, Quiz competitions, Article published, Participation in Summer school/ Winter School / Short term course, Scientific Surveys, Societal Surveys, Field Visits, Study tours, Industrial Visits, online/offline Courses on Yoga (Yoga for IQ development, Yoga for Ego development, Yoga for Anger Management, Yoga for Eyesight Improvement, Yoga for Physical Stamina, Yoga for Stress Management, etc.). These can be completed cumulatively during **Semester I, II, III and IV. Its credits and grades will be reflected in semester IV credit grade report.**

Sant Gadge Baba Amravati University Amravati

FACULTY :

Scheme of Teaching, Learning, Examination & Evaluation leading to Two Years PG Degree Master of Science (Biotechnology) following Three Years UG Programme wef 2023-24 (Two Years- Four Semesters Master's Degree Programme- NEPv23 with Exit and Entry Option**M. Sc. (Biotechnology) Second Year Semester- III**

S. N.	Subject	Type of Course	Subject Code	Teaching & Learning Scheme							Duration Of Exam Hours	Examination & Evaluation Scheme							
				Teaching Period Per Week				Credits				Maximum Marks					Minimum Passing		
				L	T	P	Total	L/T	Practical	Total		Theory		Practical		Total Marks			
												Theory Internal	Theory External	Internal	External		Marks Internal	Marks External	Grade
1	DSC-I.3 - Genetic Engineering	Th-Major	DSC-I. 3 BT	3			3	3		3	3	40	60			100	12	28	P
2	DSC-II.3 Bioprocess Engineering & Technology	Th-Major	DSC-II. 3 BT	3			3	3		3	3	40	60			100	12	28	P
3	DSC-III.3 Bioinformatics & Computational Biology	Th-Major	DSC-III. 3 BT	3			3	3		3	3	40	60			100	12	28	P
4	DSE-I.3 /MOOC	Th-Major Elective	DSE-I. 3 BT	2			2	2		2	1.5	50				50	20		P
5	DSE-II.3 /MOOC	Th-Major Elective	DSC-II. 3 BT	2			2	2		2	1.5	50				50	20		

																		Minimum Passing Marks	
4	DSC-I.3 Lab/Pr Genetic Engineering	Pr-Major	DSC-LC-I. 3 BT			6@	6@		2										P
5	DSC-II.3 Lab Bioprocess Engineering & Technology	Pr-Major	DSC-LC-II. 3 BT			6*	6*		1.5	5	12			50	50	100	50	P	
5	DSC-III.3 Lab Bioinformatics & Computational Biology	Pr-Major	DSC-LC-III. 3 BT			6*	6*		1.5									P	
7	Research Project Phase-I	Major	RP-I. 3BT		2	4	6	2	2	4				50	--	50	25	P	
8	Co-curricular Courses: Health and wellness, Yoga Education, Sports and Fitness, Cultural Activities, NSS/NCC, Fine/Applied/Visual/Performing Arts During Semester I, II, III and IV	Generic Optional		90 Hours Cumulatively From Sem I to Sem IV															
	TOTAL									22						550			

L: Lecture, T: Tutorial, P: Practical/Practicum

Pre-requisite Course mandatory if applicable: **Prq**, Theory : **Th**, Practical/Practicum: **Pr**, Faculty Specific Core: **FSC**, Discipline Specific Core: **DSC**, Discipline Specific Elective: **DSE**, Laboratory: **Lab**, **OJT**: On Job Training; Internship/ Apprenticeship; Field projects: **FP**; **RM**: Research Methodology; Research Project: **RP**, **Co-curricular Courses: CC**

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On Job Training, Internship/ Apprenticeship; Field projects **Related to Major (During vacations of Semester I and Semester II) for duration of 120 hours mandatory to all the students, to be completed during vacations of Semester I and/or II.**

Co-curricular Courses: In addition to the above, CC also include but not limited to Academic activities like paper presentations in conferences, Aavishkar, start-ups, Hackathon, Quiz competitions, Article published, Participation in Summer school/ Winter School / Short term course, Scientific Surveys, Societal Surveys, Field Visits, Study tours, Industrial Visits, online/offline Courses on Yoga (Yoga for IQ development, Yoga for Ego development, Yoga for Anger Management, Yoga for Eyesight Improvement, Yoga for Physical Stamina, Yoga for Stress Management, etc.). These can be completed cumulatively during **Semester I, II, III and IV. Its credits and grades will be reflected in semester IV credit grade report.**

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FACULTY :

Scheme of Teaching, Learning, Examination & Evaluation leading to Two Years PG Degree Master of Science (Biotechnology) following Three Years UG Programme wef 2023-24 (Two Years- Four Semesters Master's Degree Programme- NEPv23 with Exit and Entry Option

M. Sc. (Biotechnology) Second Year Semester- IV [Level 6.5]

S. N.	Subject	Type of Course	Subject Code	Teaching & Learning Scheme								Duration Of Exam Hours	Examination & Evaluation Scheme							
				Teaching Period Per Week				Credits					Maximum Marks					Minimum Passing		
				L	T	P	Total	L/T	Practical	Total	Theory		Practical		Total Marks	Marks Internal	Marks External	Grade		
											Theory Internal		Theory External	Internal					External	
1	DSC-I.4 Animal Cell Science & Technology	Th-Major	DSC-I. 4 BT	3			3	3		3	3	40	60			100	12	28	P	
2	DSC-II.4 Industrial Biotechnology	Th-Major	DSC-II. 4 BT	3			3	3		3	3	40	60			100	12	28	P	
3	DSC- III.4 Environmental Biotechnology	Th-Major	DSC-III. 4 BT	3			3	3		3	3	40	60			100	12	28	P	
4	DSE-IV.1 /MOOC	Th-Major Elective	DSE-I. 4 BT	2			2	2		2	1.5	50				50	20		P	
4	DSE-IV.2 /MOOC	Th-Major Elective	DSE-II. 4 BT	2			2	2		2	1.5	50				50	20		P	

																	Minimum Passing Marks		
5	DSC-I.4 Lab Animal Cell Science & Technology	Pr-Major	DSC-LC-I. 4 BT			2	6@	6@	2										P
6	DSC-II.4 Lab Industrial Biotechnology	Pr-Major	DSC-LC-II. 4 BT			2	6*	6*	1.5	5	12			50	50	100	50	P	
7	DSC-III.4 Lab Environmental Biotechnology	Pr-Major	DSC-LC-III. 4 BT			2	6*	6*	1.5									P	
9	Research Project Phase-II	Major			2	8	10	2	4	6	3			75	75	150	75	P	
10	Co-curricular Courses: Health and wellness, Yoga Education, Sports and Fitness, Cultural Activities, NSS/NCC, Fine/Applied/Visual/Performing Arts During Semester I, II, III and IV	Generic Optional		90 Hours Cumulatively From Sem I to Sem IV															
	TOTAL									24						650			

L: Lecture, T: Tutorial, P: Practical/Practicum

Pre-requisite Course mandatory if applicable: **Prq**, Theory : **Th**, Practical/Practicum: **Pr**, Faculty Specific Core: **FSC**, Discipline Specific Core: **DSC**, Discipline Specific Elective: **DSE**, Laboratory: **Lab**, **OJT**: On Job Training: Internship/ Apprenticeship; Field projects: **FP**; **RM**: Research Methodology; Research Project: **RP**, **Co-curricular Courses: CC**

Note: **Co-curricular Courses**: In addition to the above, CC also include but not limited to Academic activities like paper presentations in conferences, Aavishkar, start-ups, Hackathon, Quiz competitions, Article published, Participation in Summer school/ Winter School / Short term course, Scientific Surveys, Societal Surveys, Field Visits, Study tours, Industrial Visits, online/offline Courses on Yoga (Yoga for IQ development, Yoga for Ego development, Yoga for Anger Management, Yoga for Eyesight Improvement, Yoga for Physical Stamina, Yoga for Stress Management, etc.). These can be completed cumulatively during **Semester I, II, III and IV**. **Its credits and grades will be reflected in semester IV credit grade report.**

