

MANGALORE UNIVERSITY
DEPARTMENT OF BIOSCIENCES
M.Sc. BIOTECHNOLOGY

Scheme and Syllabus for two-year (four semester) M.Sc. in Biotechnology under Choice-based Credit System (CBCS)

Preamble:

As per guidelines of the UGC and Higher Education Council, Government of Karnataka, the Board of Studies in Biotechnology, Mangalore University framed a new syllabus according to the regulations governing the Choice-based Credit System for the two-year (four semester) M.Sc. Degree Programmes in 2016. The syllabus has now been revised.

The M.Sc. programme in Biotechnology under CBCS scheme has a total of 90 credits consisting of hard core courses (including project work) for 58 credits (64%) and soft core courses with choice for 26 credits (29%) and open elective courses with choice for a total of 6 credits.

Program outcome:

- PO 1 To engage and to involve the student in a challenging curriculum of the state-of-the-art in Biotechnology through a systematic study of the basics that support excellence in competitive examinations and lend competence to its application in the medical, agriculture, industrial, pharmaceutical, environmental sectors through value-based education towards sustainable development.
- PO 2 The student is equipped with the required soft, transferable and technical skills through adequate practical sessions, test your learning through periodic tests, self study by means of assignments and presentation skills through seminars, all essential for careers in the industry, academia or entrepreneurship.

Program specific outcomes:

- PSO 1 State-of-the-art, up-dated knowledge in the field of Biotechnology
- PSO 2 Laboratory-based skill training in biosafety and good laboratory practices
- PSO 3 Independent work in the lab through project work
- PSO 4 Edge in competitive exams through a challenging academic programme.
- PSO 5 Exposure to labs/institutes through Summer Training/Research/Internship Programme
- PSO 6 Develop a job profile for R&D, QC, QA etc in companies
- PSO 7 Develop entrepreneurial know-how

M.Sc. BIOTECHNOLOGY PROGRAM CONTENTS

FIRST SEMESTER	Hrs/week	Credits
<u>HARD CORE COURSES</u>		
BTH 401 Biochemistry and Biophysics	4	4
BTH 411 Molecular Cell Biology	4	4
BTH 414 Microbiology	4	4
<u>SOFT CORE COURSES (Any One to be opted)</u>		
BTS 404 Enzymology	3	3
BTS 412 Molecular Genetics		
<u>PRACTICAL COURSES</u>		
BTP 406 Biochemistry	4	2
BTP 413 Molecular Cell Biology	4	2
BTP 408 Microbiology	4	2
BTP 409 Enzymology	4	2
BTP 407 Molecular Genetics		
<u>SECOND SEMESTER</u>		
<u>HARD CORE COURSES</u>		
BTH 468 Molecular Biology	4	4
BTH 464 rDNA technology	4	4
BTH 465 Immunotechnology	4	4
<u>SOFT CORE COURSES (Any One to be opted)</u>		
BTS 454 Bioanalytical Techniques	3	3
BTS 455 Radiation Biology		
<u>PRACTICAL COURSES</u>		
BTP 469 Molecular Biology	4	2
BTP 466 rDNA technology	4	2
BTP 467 Immunotechnology	4	2
<u>OPEN ELECTIVE COURSES (Any One to be opted)</u>		
BTE 459 Biotechnology in daily life	3	3
BTE 460 Food security		
<u>THIRD SEMESTER</u>		
<u>HARD CORE COURSES</u>		
BTH 516 Industrial Biotechnology	4	4
BTH 517 Agribiotechnology	4	4
<u>SOFT CORE COURSES (Any One to be opted)</u>		
BTS 520 Nanobiotechnology		
BTS 513 Research Methodology and Bioinformatics	3	3
<u>PRACTICAL COURSES</u>		
BTP 518 Industrial Biotechnology	4	2
BTP 519 Agribiotechnology	4	2
BTP 521 Nanobiotechnology		2
BTP 514 Research Methodology and Bioinformatics	3	

OPEN ELECTIVE COURSES (Any One to be opted)

BTE 511 Environmental Management	3	3
BTE 512 Advances in Medicine		

FOURTH SEMESTER

HARD CORE COURSES

BTH 560 Biomedical Engineering	4	4
BTH 552 Environmental Biotechnology	4	4

PRACTICAL COURSES

BTP 561 Biomedical Engineering	4	2
BTP 557 Environmental Biotechnology	4	2

PROJECT WORK

BTP 558 Project Work (Dissertation & Viva)	4	4
--	---	---



MANGALORE UNIVERSITY
CHOICE BASED CREDIT SYSTEM (CBCS)
Scheme and Syllabus for M.Sc. Biotechnology

FIRST SEMESTER

Paper Code	COURSE TITLE	Teaching Hrs/week	Exam Hrs	Marks		Total	Credits
				IA*	Exam		
HARD CORE COURSES - THEORY							
BTH 401	Biochemistry and Biophysics	4	3	30	70	100	4
BTH 411	Molecular Cell Biology	4	3	30	70	100	4
BTH 414	Microbiology	4	3	30	70	100	4
SOFT CORE COURSES –THEORY (CHOOSE ANY ONE)							
BTS 404	Enzymology	3	3	30	70	100	3
BTS 412	Molecular Genetics						
PRACTICALS							
BTP 406	Biochemistry	4	3	15	35	50	2
BTP 407	Molecular Genetics	4	3	15	35	50	2
BTP 408	Microbiology	4	3	15	35	50	2
BTP 409	Enzymology	4	3	15	35	50	2
BTP 413	Molecular Cell Biology						
Total						600	23

SECOND SEMESTER

Paper Code	COURSE TITLE	Teaching Hrs/week	Exam Hrs.	Marks		Total	Credits
				IA*	Exam		
HARD CORE COURSES -THEORY							
BTH 468	Molecular Biology	4	3	30	70	100	4
BTH 464	rDNA technology	4	3	30	70	100	4
BTH 465	Immunotechnology	4	3	30	70	100	4
SOFT CORE COURSES -THEORY (CHOOSE ANY ONE)							
BTS 454	Bioanalytical Techniques	3	3	30	70	100	3
BTS 455	Radiation Biology						
PRACTICALS							
BTP 469	Molecular Biology	4	3	15	35	50	2
BTP 466	rDNA technology	4	3	15	35	50	2
BTP 467	Immunotechnology	4	3	15	35	50	2
OPEN ELECTIVES (CHOOSE ANY ONE)							
BTE 462	Biotechnology in daily life	3	3	30	70	100	3
BTE 463	Food Security						
Total						650	24

THIRD SEMESTER

Paper Code	COURSE TITLE	Teaching Hrs/week	Exam Hrs.	Marks		Total	Credits
				IA*	Exam		
HARD CORE COURSES -THEORY							
BTH 516	Industrial Biotechnology	4	3	30	70	100	4
BTH 517	Agribiotechnology	4	3	30	70	100	4
SOFT CORE COURSES -THEORY (CHOOSE ANY ONE)							
BTS 513	Research Methodology and Bioinformatics	3	3	30	70	100	3
BTS 520	Nanobiotechnology						
PRACTICALS							
BTP 518	Industrial Biotechnology	4	3	15	35	50	2
BTP 519	Agribiotechnology	4	3	15	35	50	2
BTP 514	Research Methodology and Bioinformatics	3	3	15	35	50	2
BTP 521	Nanobiotechnology						
OPEN ELECTIVES (CHOOSE ANY ONE)							
BTE 511	Environmental Management	3	3	30	70	100	3
BTE 512	Advances in Medicine						
Total						550	20

FOURTH SEMESTER

Paper Code	COURSE TITLE	Teaching Hrs/week	Exam Hrs.	Marks		Total	Credits
				IA*	Exam		
HARD CORE COURSES –THEORY							
BTH 560	Biomedical Engineering	4	3	30	70	100	4
BTH 552	Environmental Biotechnology	4	3	30	70	100	4
PRACTICALS							
BTP 561	Animal Biotechnology	4	3	15	35	50	2
BTP 557	Environmental Biotechnology	4	3	15	35	50	2
PROJECT WORK							
BTP 558	Project Work with Dissertation and Viva	4	4	30	70	100	4
Total						400	16
Grand Total						2200	83

IA includes Seminar/Assignment (per Course), Internal Tests (per Course), Objective Test [MCQs, Fill in the blanks, True/False, Problem solving, Analytical questions, Calculations, Definitions] (per Course) = 30

Scheme of M.Sc. Biotechnology Programme (CBCS)

SEM	HARD CORE COURSES			SOFT CORE COURSES			OPEN ELECTIVES	PROJECT	TOTAL
	No of Courses	Credits	Total Credits	No of Courses	Credits	Total Credits	Total Credits		
I	3Th+3Pr	4+2	18	1Th+1Pr	3+2	5			23
II	3Th+3Pr	4+2	18	1Th	3	3	3		24
III	2Th+2Pr	4+2	12	1Th+1Pr	3+2	5	3		20
IV	2Th+2Pr	4+2	12					4	16
Total			60			13	6	4	83

NOTE:

BASIS FOR INTERNAL ASSESSMENT: Internal Assessment marks in theory papers shall be awarded on the basis of theory test (70 Marks), Objective Test (MCQs)(15 Marks), Seminars and Assignments (15 Marks). The marks obtained shall be reduced to 30. The tests may be conducted 14 weeks after the start of a Semester. Practical Internal Assessment marks shall be based on practical test and records. 60 marks for Practical test and 10 marks for Class record. The marks obtained shall be reduced to 30. The test may be conducted 14 weeks after the start of a Semester. 70 marks for project work (Report/Dissertation and Presentation/Viva).

THEORY QUESTION PAPER PATTERN: Question Papers in all the four semesters consists of three sections (Model question paper enclosed). Section I: Write short notes on any ten out of twelve: (10x2=20 Marks) Section II: Write explanatory notes on any five out of seven: (5x6=30 Marks). Section III: Write long answers on any two out of four: (2x10=20 Marks). Questions are to be drawn from all the units of the syllabus by giving equal weightage to all the units.

PRACTICAL QUESTION PAPER PATTERN: 30 marks for practical exam proper (Major experiment-10 marks, Minor experiments/Problem solving-05+05 marks, Identify and Comment on-4x2.5=10 marks) and 05 marks for Class record. The Project work may be conducted either in the Department or any other Institution or in an Industry. Project Report/Dissertation and Presentation/Viva carry 70 marks.