

CURRICULUM & SYLLABUS



CHOICE BASED CREDIT SYSTEM (CBCS)

FOR

MASTER OF SCIENCE (M.Sc.)

(2 Year Postgraduate Degree Programme)

IN

BIOTECHNOLOGY

[w. e. f. 2023-24]

FACULTY OF SCIENCE & HUMANATIES
SRM UNIVERSITY DELHI-NCR, SONEPAT
No.39, Rajiv Gandhi Education City, Sonapat
Haryana-131029

SCHEME OF STUDIES & SYLLABUS

MASTER OF SCIENCE

(2 Years Degree Programme)

BIOTECHNOLOGY

(w.e.f. Session 2023-24 onwards)



DEPARTMENT OF BIOTECHNOLOGY

FACULTY OF SCIENCE & HUMANATIES

SRM UNIVERSITY DELHI-NCR, SONEPAT

SONEPAT, HARYANA -131029

Course Structure
Details of Course M.Sc. (Biotechnology)
Course Credits: Theory & Practical

I. Course Theory (14 Papers)	14X3+1=43
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II. Course Electives (3 Papers)	3X3=9
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III. Course Practical (8 Papers)	8×2=16
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IV. Project Work and Dissertation	1X14=14
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V. Seminar/Research Paper/Research Methodology	2X1=2
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V. Live Project	1X2=2
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Total 86 Credits

M.Sc. Biotechnology Graduates Employability Attributes

- **Sound knowledge and understanding of the domain areas:** Graduates have a thorough knowledge and understanding of their subject area, as well as the capacity to apply what they've learned in the classroom, even in multidisciplinary courses.
- **Creative , Critical thinking and Problem solving:** Effective problems-solvers, able to apply critical, creative and evidence-based thinking to conceive innovative responses to future challenges.
- **Communication Skills and Team work:** Successfully communicate ideas and information to all members and audiences in a collaborative way in order to achieve common goals.
- **Dependability, reliability, responsibility, and independent leadership abilities:** Graduates have the capacity to be entrepreneurial and take leadership roles in their chosen industries or careers, as well as in their communities.

M.Sc. BIOTECHNOLOGY PROGRAM EDUCATIONAL OBJECTIVES (PEOs)

- To inculcate the students with recent in the areas of genomics, genetic engineering, proteomics, bioinformatics, gene therapy, cell culture, the discovery of new drugs and Pharmacogenomics.
- Students will learn to develop specialized skills in the different areas of biotechnology.
- Students will learn about the use of biotechnology empirically and creatively to address local and worldwide questions.
- Students will be able to apply the scientific knowledge to develop entrepreneurship abilities.

M.Sc. BIOTECHNOLOGY PROGRAM LEARNING OUTCOMES (PLOs)

- Students will be capable of doing collaborative and multidisciplinary studies.
- Aptitude to carry out research in specialized areas of biotechnology.
- Students will be able to work both independently or in groups on complex projects that require collaboration across disciplines.
- Students will be capable of designing an experiment with step-by-step instructions to address a research problem.
- Capable to present the results/findings in the scientific meetings/conferences/symposia.

MAPPING MATRIX OF PEOs & PLOs

Programing Educational Objectives (PEO's)	Program Learning Outcomes (PLO's)				
	PLO1	PLO2	PLO3	PLO4	PLO5
PEO1	✓	✓			
PEO2			✓		✓
PEO3				✓	
PEO4					✓

SEMESTER-I

Course Code	Course Name	Lectures (L) Hours Per Week	Tutorial (T) Hours Per Week	Practical (P) Hours Per Week	Total Credit (C)
21MBM101	Microbiology	3	-	-	3
21MBM102	Cell Biology	3	-	-	3
21MSB103	Biochemistry	3	-	-	3
21MBM104	Biophysics & Instrumentation Technology	3	-	-	3
21MBM105	Molecular Biology & Genetics	3	-	-	3
21MPEXXX	Department Elective- 1	3	-	-	3
21MBM151	Lab 1 -Microbiology	-	-	4	2
21MBM153	Lab2 -Biochemistry	-	-	4	2
21MBM155	Lab 3 -Molecular Biology	-	-	4	2
	Total	18	-	12	24
	Total Contact Hours	30			

Department Elective-1	Subjects
21MPE101	Animal Biotechnology
21MPE102	Plant Biotechnology
21MPB103	Environmental Biotechnology

SEMESTER-II

Course Code	Course Name	Lectures (L) Hours Per Week	Tutorial (T) Hours Per Week	Practical (P) Hours Per Week	Total Credit (C)
21MBM201	Genomics & Proteomics	3	-	-	3
21MSB202	Recombinant DNA Technology	3	-	-	3
21MBM203	Bioinformatics & Computational Biology	3	-	-	3
21MSB204	Bioethics, IPR & Biosafety	3	-	-	3
21MBM205	Immunology and Immunotherapy	3	-	-	3
21MPEXXX	Department Elective-2	3	-	-	3
21MSB252	Lab4 -RDT Lab	-	-	4	2
21MBM255	Lab 5 -Immunology Lab	-	-	4	2
21MBM253	Lab6 -Computational Biology Lab	-	-	4	2
	Total	18	-	12	24
	Total Contact Hours	30			

Department Elective-2	Subjects
21MPE201	Drug Designing & Pharmacogenomics
21MPE202	Enzymology
21MPE203	Virology

SEMESTER-III

Course Code	Course Name	Lectures (L) Hours Per Week	Tutorial (T) Hours Per Week	Practical (P) Hours Per Week	Total Credit (C)
21MBM301	Downstream Processing & Fermentation Technology	3	-	-	3
21MBM302	Biostatistics	3	-	-	3
21MSB303	Advanced Structural Biology	3	-	-	3
21MSB304	Nanobiotechnology	3	-	-	3
21MPEXXX	Department Elective-3	3	-	-	3
21MBM351	Lab 7 -Downstream Processing Lab	-	-	4	2
21MSB354	Lab8 - Applied Biotechnology Lab	-	-	4	2
21MBM355	Seminar/Research Paper & Technical Writing	1	1	-	2
21MBM356	Minor Project/Live Project	-	-	4	2
21MBM357	Research Methodology	1	-	-	1
	Total	17	1	12	24
	Total Contact Hours	30			

Department Elective-3	Subjects
21MPB301	Pharmaceutical Biotechnology
21MPB302	Industrial Biotechnology
21MPE303	AI & ML in Biological Sciences
21MPE304	Nutritional Immunology

SEMESTER-IV

Course Code	Course Name	Lectures (L) Hours Per Week	Tutorial (T) Hours Per Week	Practical (P) Hours Per Week	Total Credit (C)
21MSB451	Project Work (22-24 Weeks)	-	-	18	9
21MSB452	Dissertation Presentation and Viva Voice	-	-	10	5
	Total Credits				14