JOY UNIVERSITY

semper paratus

M. Sc. Biotechnology

(Syllabus with effect from 2025-2026)

CHOICE BASED FLEXIBLE CREDIT SYSTEM

School of Life and Health Sciences

Department of Biotechnology

Vision

Promote & provide highest standards of health care & life sciences education through innovative teaching & training methods to empower individuals with the right skillsets, knowledge & compassionate attitude in order to serve the society.

MISSION

- To create a cadre of competent healthcare & life sciences professionals
- To nurture talent & provide training in emerging healthcare technologies
- To extend student's knowledge & practical skills beyond the classrooms and to inculcate entrepreneurial spirit.
- To enhance the Joy university brand as a force to reckon with for education in life & health sciences.

Name of the Department: Department of Biotechnology

Name of the Program: M. Sc. Biotechnology

Duration of the degree: 2 Years

Program Code: MSBT

Current opportunities in biotechnology no more vested upon merely demands for gene- jockeys but those who master diverse skills associated with various dogmas in life science and utilize interventions in them towards solving global issues relevant to both industry, academia dealing with agriculture, environment, food security, bioenergy, healthcare, medicine and so on within the. targeting both the current and future scope of applications of the Biotechnology state of art, the regimens for this program are specifically designed to allow students to fulfil below program educational objectives:

Program Educational Objectives (PEOs)

PEO1. To update, extend and deepen students 'knowledge thorough a flexible, research-

intensive program akin to academia and industry requirements.

PEO2. To enhance career opportunities in industry, clinical settings both locally and globally or as a preparation for further higher education through in–house state of the art laboratory exposures and outbound dissertation activities fostering Global Competencies among Students.

PEO3. To enable critical thinking and full-fledged grasp of essential aspects of bioethics Inculcating a Value System among Students.

PEO4. To enrich the global think tanks with right mixes of innovative ability, existing policies at generating and safeguarding the product of their intellect, equipped with entrepreneurship abilities contributing to self and national development.

Program Outcomes (POs)

PO1. Scientific Knowledge: Apply the knowledge of Science, Mathematics, Engineering& Technology fundamentals to solve the complex problems.

PO2. Design/development of solutions: Design solutions for complex engineering problems and design system components or processes that meet the specified needs with appropriate consideration for the public health and safety, and the cultural, societal, and environmental considerations.

PO3. Problem analysis: Identify, formulate, research literature, and analyze complex scientific problems reaching substantiated conclusions using first principles of mathematics, natural sciences, and engineering sciences.

PO4. Modern tool usage: Create, select and apply appropriate techniques, resources, modern technology and IT tools to complex science and technological activities.

PO5. Environment and sustainability: Understand the impact of professional science and technological solutions in societal and environmental contexts and for sustainable development.

PO6.Individual and team work: Function objectively as an individual and as a member in diverse teams.

PO7. Communication: Communicate effectively on complex science & technology activities with society at large and able to write effective reports and documentation.

PO8. Life-long learning: Recognise the need and ability to engage in independent and lifelong learning in the context of technological change.

Program Specific Outcomes (PSOs)

PSO1. Scientific Knowledge: Ability to build a strong foundation of knowledge, integrated with the latest developments in science and technology which help students develop critical thinking, reasoning, decision making in process of quality education.

PSO2. Problem Analysis: Identify, formulate and analyse the complex scientific problems using the knowledge gained across various streams of science and technology.

PSO3. Effective Communication: Ability to articulate ideas, communicate effectively using current tools in the field of ICT along with effective report writing and documentation.

PSO4. Development of Skill and Attitude: Enabling the students with the required skill, right attitude, time management and self discipline for prominent career in industry, research institutes and for further academic study.

PSO5. Life Long Learning and Social Responsibility: Recognise the need and ability to engage in life long learning and work effectively as an individual and as a member of diverse team. Students get the ability to act with an informed awareness of issues to participate in civic life through volunteering.

M. Sc Biotechnology – I Semester

SN	Course Code	Course Title	L	T	P	Contact Hrs/Wk	Credits
1.	25MSBT711	Advance Cell Biology	4	0	2	6	5
2.	25MSBT712	Advance Biochemistry	4	0	2	6	5
3	25MSBT713	Microbiology	4	0	2	6	5
4.	25MSBT714	Bio- Physical Chemistry & Instrumentation	4	0	2	6	5
		GE-I 25MSBT111A/MSBT111B	3	0	0	3	3
6.	25MSBT111A	Research Methodology					
7.	25MSBT111B	Science Journalism					
		TOTAL	**19**	**0**	**8**	**27**	**23**

M. Sc Biotechnology – II Semester

SN	Course Code	Course Title	L	T	P	Contact Hrs / Wk	Credits
1.	25MSBT721	Advance Molecular Biology	4	0	2	6	5
2.	25MSBT722	Computer Applications and Biostatistics	4	0	2	6	5
3.	25MSBT723	Advance Immunology	4	0	2	6	5
4.	25MSBT132A	Industrial Biotechnology	4	0	2	6	5
5.							
6.		GE-II MSBT121A/MSBT121B	3	0	0	3	3
7.	MSBT121A	Entrepreneurship					
8.	MSBT121B	Intellectual Property Rights					
		TOTAL	**19**	**0**	**8**	**27**	**23**

M. Sc Biotechnology – III Semester

SN	Course Code	Course Title	L	T	P	Contact Hrs / Wk	Credits
1.	25MSBT731	Genetic Engineering	4	0	2	6	5
2.	25MSBT732	Animal Biotechnology & Plant Biotechnology	4	0	2	6	5
3.	25MSBT733	Advance Genomics and Proteomics	4	0	2	6	5
4.		PSE-I MSBT131A/MSBT131B	3	0	0	3	3
5.	25MSBT131A	Enzymology					
6.	25MSBT131B	Agriculture Biotechnology					
7.		PSE-II MSBT132A/MSBT132B	3	0	0	3	3
8.	25MSBT724	Bioinformatics and Nanobiotechnology					
9.	25MSBT132B	Environmental Biotechnology					
10.	25MSBT431	Industrial Visit					1
		TOTAL	**18**	**0**	**6**	**24**	**22**

M. Sc Biotechnology – IV Semester

SN	Course Code	Course Title	Contact Hrs / Wk	Credits
1.	25MSBT541	Dissertation (Major Project)	**6 Month**	12
		TOTAL		**12**

Semester-wise Credit Load

Semester	Credits
I	23
II	23
III	22
IV	12
Total	**80**