Vidyasagar University

Midnapore-721102, West Bengal

POs & PSOs for the Post-Graduate Programme in MICROBIOLOGY

National Educational Policy – 2020

[w.e.f. 2025-26]

Department of Microbiology_2025-2026

Program Objectives (POs)

1. The objective of the Master's Program in Microbiology is to develop students' in-depth understanding of the molecular, cellular, and environmental aspects of microorganisms, enabling them to acquire advanced scientific knowledge and analytical competence.

2. The program emphasizes the integration of theoretical concepts with practical laboratory skills**,** fostering the ability to apply microbiological principles to diverse fields of microbiology.

3. The curriculum is designed to train students in experimental design, data interpretation, and research methodologies**,** thereby equipping them to pursue careers in research institutions, industries, diagnostic laboratories, academia, and governmental or regulatory agencies.

4. Through hands-on laboratory training, internships, and project work, students will develop technical expertise in microbial cultivation, molecular techniques, bioinformatics, and bioprocess engineering**,** along with adherence to biosafety and research ethics.

5. The program nurtures a scientific temperament and problem-solving approach, preparing graduates to address emerging global challenges in health, environment, food security, and biotechnology through microbial innovation and sustainable practices.

6. Students completing the program will be able to contribute effectively to interdisciplinary research and technological advancement**,** with a sound foundation to pursue doctoral studies or entrepreneurial ventures in the life sciences sector.

Program Outcomes (POs)

Post Graduates (M. Sc.) students after completion of the program will be able to achieve:

1. Acquired knowledge for the solution of complex natural and personal problems.
2. Attend profound knowledge to identify, formulate, review research literature, and analyse complex problems reaching substantiated conclusions.
3. Attend the ability to design solutions for the public health and safety, and the cultural, societal, and environmental considerations.
4. Understand the impact of the professional solutions in societal and environmental contexts, and demonstrate the knowledge of, and need for sustainable development.
5. Learn ethical principles and commit to professional ethics and responsibilities and

norms of the engineering practice.

6. Learn Individual and team work. Function effectively as an individual, and as a member or leader in diverse teams, and in multidisciplinary settings
7. Incorporated self-directed and life-long learning.

Programme Specific Outcomes (PSOs)

The M. Sc. Microbiology course will help to develop skilled scientific manpower having comprehensive knowledge in microbiology with an understanding of research ethics. After completion of the course the student has:

1. State of art knowledge about various methodological and analytic approaches that are used within the specialization.
2. In-depth knowledge in the structure of a repertoire of microorganisms, metabolism in the cell, knowledge of the concepts of molecular genetics and biosynthesis of proteins, enzymology, physiology, microbial pathogenicity, environmental and agricultural microbiology, genetic engineering, bioengineering and a good theoretical and practical insight into methods used to obtain this knowledge.
3. Demonstrate practical skills in the use of tools, technologies and methods common to microbiology, and apply the scientific method and hypothesis testing in the design and execution of experiments.
4. Knowledge of the leading edge in a chosen specialized area of microbiology, based on own research experience from a master's project and literature review and develop ability to independently carry out a complete scientific work.
5. Can compete in national/international level competitive exams and can pursue career in higher studies.