Department of Microbiology
Ahmednagar College
Learning outcomes

Program Specific Outcomes

Microbiology is a branch of science that studies "Life" taking an example of microorganisms such as bacteria, protozoa, algae, fungi, bacteria, viruses, etc. These studies integrate cytology, physiology, ecology, genetics and molecular biology, evolution, taxonomy and systematics with a focus on microorganisms; in particular bacteria. The relevance and applications of these microorganisms to the surrounding environment including human life and Mother Nature becomes part of this branch. Since inception of this branch of science, Microbiology has remained a field of actively research and ever expanding in all possible directions; broadly categorized as pure and applied science. Different branches of Pure Microbiology based on taxonomy are Bacteriology, Mycology, Protozoology and Parasitology, Phycology and Virology; with considerable overlap between these specific branches over each other and also with other disciplines of life sciences, like Biochemistry, Botany, Zoology, Cell Biology, Biotechnology, Nanotechnology, Bioinformatics, etc. Areas in the applied Microbial Sciences can be identified as: Medical, Pharmaceutical, Industrial (Fermentation, Pollution Control), Air, Water, Food and Dairy, Agriculture (Plant Pathology and Soil Microbiology), Veterinary, Environmental (Ecology, Geomicrobiology); and the technological aspects of these areas.

Department of Microbiology offers B.Sc. Microbiology and M.Sc. Microbiology

Programme specific outcomes M.Sc. Microbiology are as follows

Program	Program Objectives	Program Specific Objectives
M.Sc. Microbiology	**PO1: Critical Thinking**: Take informed actions after identifying the assumptions that frame our thinking and actions, checking out the degree to which these assumptions are accurate and valid, and looking at our ideas and decisions (intellectual, organizational, and personal) from different	Current thrust area and prospective in Microbiology are Microbial taxonomy and diversity Human health, agriculture, Microbial technology, Eukaryotic cellular organization, Eukaryotic gene expression e.g. yeast genetics, Determinants of microbial

	perspectives. **PO2: Environment and Sustainability**: Understand the issues of environmental contexts and sustainable development. **PO3: Problem Solving Approach:** Develop the ability to not only recognize problems but also seek solutions for them. **PO4: Research Aptitude:** students should be well acquainted with research methodology which includes different skill developments in scientific writing, data handling and processing, development of research ideas and planning / designing of research projects. The skill sets thus evolved will help the students in academic and applied research.	pathogenicity, Immunopathology, immunopharmacology and cancer biology, Over-expression of Protein stability, conformation and folding, recombinant proteins Biocontrol, Bioinformatics, Molecular tools for characterization, identification of bacteria, Possible utilization of microbial population from extreme environments **Objectives to be achieved:** • To enrich students' knowledge and train them in the pure microbial sciences • To introduce the concepts of application and research in Microbiology • To inculcate sense of scientific responsibilities and social and environment awareness • To help students build-up a progressive and successful career

Course outcomes in M.Sc.

S No	Course	Learning outcomes
1	M.Sc. I	**LO 1:** Students will be able to describe classification scheme of microorganisms. **LO2:** They will be able to explain various methods of bacterial systematics like biochemical, molecular and bioinformatics. **LO 3:** Students will be able to apply statistical tools like central tendency, dispersion, correlation, regression and able to set up hypothesis for experiments and research. **LO 4:** Students will be able to use mathematical models to explain the laws of living system. **LO 5:** Students will be able to analyse the role of various biomolecules in living system, interaction of biomolecules in various processes. **LO 6:** Students are able to explain principles of various instruments used to understand living system. **LO 7:** They will be able to explain nature, structure, classification, detection methods and life cycle of viruses.
2	M.Sc. II	**LO 1:** Students will able to analyse antigen antibody interactions and able to demonstrate various in vivo in vitro techniques of immunology. **LO 2:** They will be able to understand techniques of gene manipulation and able to design experiments based on it. **LO 3:** They will be able to explain various waste water treatment processes and analyze their role in environmental cleanup. **LO 4:** They will be able to hypothesize a problem and will be able to design experiment to test the hypothesis. **LO 5:** They will be able to carry out a mini project.