Department of Microbiology

Program Specific Outcome

- These include courses focused on the interaction between microorganisms and human disease, such as infectious diseases, medical microbiology, and immunology.
- Investigate the role of microbes in the environment including environmental microbiology, microbial ecology and industrial microbiology and biotechnology.
- From bioremediation to virology, students will develop an understanding of biological and chemical systems of microorganisms — and develop a foundation for a career in a range of professions that involve microbiology.
- Students will be able to communicate scientific information effectively, especially relating to microbiological organisms, and the roles of microbial organisms in ecosystem function and health-related issues
- Students will be able to collect, analyze and interpret scientific data, including developing a familiarity with microbiology laboratory techniques and safety procedures
- Students will be able to apply the scientific method as a demonstration that they understand its application furthering our knowledge of the microbial world
- Students will be able to describe fundamental principles of biology e.g., central dogma, diversity of life, inheritance and how these principles relate to microorganisms
- Students will be able to describe unique microbial genetic systems (i.e., prokaryotic and viral genomes, lateral gene transfer, plasmid structure and function, etc.)
- Students will appreciate the biological diversity of microbial forms, and appreciate that this diversity results from evolutionary processes
- Students will be able to access and interrogate the primary scientific literature and be aware of leading journals in the field of microbiology
- Students will gain familiarity with the role of microbes in human disease, the role of microbes in issues of international health, and the human immune response to microbial infection

Course outcome of Microbiology Department

Class	Course	Outcome
F.Y.B.Sc.	MB 101: Microbial Diversity	1. Understand the basic microbial structure and study the comparative characteristics of prokaryotes and eukaryotes and also Understand the structural similarities and differences among various physiological groups of bacteria/archaea
		2. Know general bacteriology and microbial aspects pertinent to bacteria, fungi and algae
		3. How the subject emerge as new branch of biology
		4. Learn ancient view about life continuity and concept of experiment
		5. Aware about historical developments and their applications as technology
		6. Cognizant about contribution of various pioneers of microbiology
		7. Aware about diversity of microorganism
		8. Impact of microbes on earth atmosphere, health and technology development
		9. Recognise the scope of microbiology in all spheres of life and industrial sector
		10. Ways to classify the living system
		11. Understand the taxonomy (identification, binomial nomenclature, and Classifications schemes/keys) and comprehend the various approaches of microbial taxonomy.
	MB 102: Microscopy and Basic Bacteriology	1. Demonstrate theory in microscopy and their handling techniques and staining procedures
		2. Know various Culture media and their applications and also understand various physical and chemical means of sterilization
		3. Know general bacteriology and microbial techniques for isolation of pure cultures of bacteria, fungi and algae
		4. Learn aseptic techniques and be able to perform routine culture handling tasks safely and effectively
		5. Comprehend the various methods for identification of unknown microorganisms
		6. Understand the modes of nutrition in microbial metabolism and able to classify the bacteria based on nutrition
		7. Know the various Physical and Chemical growth requirements of bacteria and get

		equipped with various methods of bacterial growth measurement
	MB 103: Microbiology Practical Paper - I	1. Inculcate the ability to apply the process of science
		2. Demonstrate ability to formulate hypotheses and design experiments based onthe scientific method.
		3. Analyse and interpret results from a variety of microbiological methods and apply these methods to analogous situations
		4. Develop ability to use quantitative reasoning to solve problems in microbiology
		5. Aware and train in aseptic handling of microbial specimens. Practice safe microbiology, using appropriate protective and emergency procedures
		6. Document and report on experimental protocols, results and conclusions
	MB 201: Basic Biochemistry and Cytology	1. Understand the basic microbial structure and function and study the comparative characteristics of prokaryotes and eukaryotes and also Understand the structural architecture and differences among bacteria/archaea
		2. Know basic knowledge pertinent to cell biomolecules as such
	MB 202: Microbial Techniques	1. Know general bacteriology and introduce microbial techniques for isolation of pure cultures of bacteria, fungi, algae and virus
		2. Demonstrate theory and practical skills in handling microbial culture
		3. Know various bacteria based on nutritional needs and also understand various physical and chemical means of sterilization
		4. Discern knowledge about sterility assessment of sterilizing agents
	MB 203: Microbiology Practical -II	1. To instil practical skills about methods of isolation, characterization, control of microbes and familiarize with fundamental aspect of cellular chemistry
S.Y.B.Sc.	MB 231: Fundamental Biochemistry	1. Understand the concept of biomolecules its structure and classification.
		2. Study the concept and properties of enzyme and enzyme action
		3. Concept of metabolism

	MB-232: Microscopy and Microbial Ecology	1. understand the principle working and ray diagram of microscope 2. study the microbial interaction and microbial ecology 3. Study the environmental microbiology
	MB-241: Genetics and Immunology	1. study the concept of gene and chromosome 2. Concept and significance of mutation 3. Understanding the immunology, infection and mode of transmission.
	MB- 242: Basic Microbial Biotechnology	1. study the basic concept of fermentation technology 2. recovery of product
T.Y.B.Sc.	MB351 Microbial genetics	1. Concept of central dogma of molecular biology 2. Mechanism of DNA replication transcription and translation 3. Study the Bacteriophage genetics 4. understand the gene transfer mechanism : Transformation conjugation transduction
	MB-361: Molecular Biology	1. Understanding the concept of regulation of gene action 2. Principle and application of different molecular techniques 3. study the concept and methodology of r--DNA technology
	MB-352: Fermentation Technology	1. Study the fermentation technology includes type of bioreactor 2. Industrial sterilisation and strain improvement 3. Scale up and large scale production
	MB-362: Pharmaceutical Microbiology	1. Concept of quality control and quality assurance 2. Microbiological Aspects of Pharmaceuticals 3. Large scale production of antibiotics enzymes vitamins etc
	MB-353: Microbial Metabolism	1. Study the law of thermodynamics, free energy change redox reaction etc 2. Understanding the anabolism and catabolism

		in bacteria
	MB-363: Enzymology	1. Understanding the structure and biochemical function of vitamins
		2. Study the enzyme regulation
		3. method of enzyme purification and enzyme assay technique
	MB-354: Medical Microbiology	1. Study the concept of medical microbiology
		2. Anatomy of human system
		3. chemotherapeutic agent
	MB-364: Clinical Microbiology	1. Understanding the concept of clinical microbiology
		2. Viral infection and disease
		3. Bacterial infection and disease.
		4. Fungal and protozoal disease
	MB-355: Immunology	1. Cell and organs involved in immune system
		2. mechanism of immune system and inflammatory response
		3. Immunological disorder
	MB-365: Diagnostic Immunology	1. Antigen and Antibody Reaction
		2. Study the different immunological techniques
		3. Transplantation and Tumor Immunology
	MB-356: Applied Microbiology	1. Microbiological examination of milk
		2. food fermentation and preservation
		3. Geomicrobiology and Nanotechnology
	MB-366: Environmental Microbiology	1. Classification of plant diseases based on symptoms
		2. Microbial Waste Treatment Methods
		3.Concepts - Bioremediation, Bioaugmentation and Biostimulation