



Mahatma Gandhi Vidyamandir's

**Loknete Vyankatrao Hiray Arts, Science and Commerce College,  
Panchavati, Nashik-422003**

(Affiliated to SPPU, Pune, Reaccredited with 'A' grade, Recipient of Best College Award by SPPU)

**Programme Specific Outcomes,  
&  
Course Outcomes of B.Sc.**

**Department of Zoology**

**Academic Year**

**2021-22**

## Programme Specific Outcomes: B.Sc. Microbiology

Name of the Department :Microbiology	
Program Specific Outcomes	
At the end of the programme, student will be able to	
1	Gain and understand microbiological, biochemical and molecular processes
2	Communicate scientific information effectively, relating to microbes and their role in ecosystem and health
3	Acquire, articulate, retain and demonstrate laboratory safety skills
4	Demonstrate applications of biochemical and biological sciences
5	Gain and understanding of biochemical and molecular processes that occur in and between cells to expand understanding of biology
6	Inculcating proficiency in all experimental techniques and methods of analysis

## Course Outcomes: B.Sc. Microbiology

**Class :F.Y.B.Sc**

**Semester-I**

Paper	Course code & course title	At the end of the course, student will be able to
I	Introduction To Microbial World	Learn and gain the details of the historical development, Golden Era and Modern Era of Microbiology.
		Understand the details of Systems of classification.
		Specify in depth Bacteria, Algae Protozoa & Fungi.
		Learn the classification and characteristics of Microorganisms.
		Specify the concept of application and research in microbiology.
		Acquired Knowledge and understanding of the microbiology concepts as applicable to diverse area such as medical, Industrial, environmental, genetics, food and other
II	Basic Techniques in Microbiology	Learn the details of Bacterial cell organization
		Understand the details of handling and use of microscope for the study of microorganism which are among the basic skill expected from practising microbiologist.
		Learn the principal of number of analytical instruments which the students have to use during the study and also later as microbiologist for performing various laboratory manipulations.
		Understand in depth Sterilization of culture media, glassware's, and plastics ware to be used for microbiological work.
		Specify the classification and characteristics of staining techniques
		Several separation techniques which may be required to be handled later as microbiologist.
III	Practical course	Principal which underlies sterilization of culture media, glassware's, and plastics ware to be used for microbiological work.
		Trained in preparing laboratory manuals, standard operating practices and logbooks.
		Understand the details of handling and use of microscope for the study of microorganism which are among the basic skill expected from practising

		microbiologist.
		Gain the knowledge for preparation of different media.
		Identify and classify the microorganism using staining techniques.
		Demonstrate applications of biochemical and biological sciences
<b>Semester II</b>		
I	Bacterial cell and Biochemistry	Developed a very good understanding of various bio molecules which are required for development and functioning of the bacterial cells.
		Have developed how the carbohydrate make the structural and functional component such as energy generation and as storage food molecules for the bacterial cells.
		To make a Buffer, study of enzyme kinetics and calculate the Vmax, Km values.
		Learn the structure, chemical composition, and function of the following component in bacterial cell
		Describe the characteristics of bacterial cells, cell organelles , cell wall composition and various appendages like capsule, flagella, Pili.
		Learn the details of Bacterial cell organization
II	Microbial cultivation and Growth	To understand the artificial cultivation techniques used for growth of microorganisms
		Learn the Isolation of microbial culture by specific microbiological isolation techniques.
		Learn the kinetics of bacterial growth and factor affecting the microbial growth
		Differentiating concept of aerobic and anaerobic respiration and how these are manifested in the form of different metabolic pathways in microorganism.
		Describing the growth characteristics of the microorganisms which require different nutrient for the growth and associated mechanism of energy generation for their growth.
		Describing the growth characteristics of the microorganisms capable of growing under unusual environmental condition of temperature, oxygen, and water activity.
III	Practical	Developed keen observation i.e. different microscopy techniques, staining

	course	techniques, and nutritional requirement
		Understand the biochemical characterization of component of microorganism and instrumental techniques to estimate component qualitatively and quantitatively.
		Gain the knowledge about isolation of microbial culture by specific microbiological isolation techniques.
		Understand the techniques used for preservation and purification of pure culture of microorganisms.
		To make a Buffer, study of enzyme kinetics and calculate the Vmax, Km values.
		Have developed a fairly good knowledge and understanding of different types of environments and habitat where microorganisms grow.

**Class :S.Y.B.Sc.**

**Semester-III**

<b>Paper</b>	<b>Course code &amp; course title</b>	<b>At the end of the course, student will be able to</b>
I	Medical Microbiology and Immunology	understood the basic and general concept of causation of disease by the pathogenic microorganism and the various
		Developed an understanding of common bacterial, viral, fungal, parasitic disease of human being
		conceptualization the protective role of the immune system of the host and developed an understanding of the basic
		Are able to conduct experiments for growing common bacteria in different microbiological media, antibiotic sensitivity
		Developed an understanding how microbiology is relevant to technological developments for the environments.
		Full knowledge of working in a microbiology laboratory taking all safety measures, handling of bacteria, disposal of infectious waste, care of the equipment requiring safety audit.
II	Bacterial physiology and	Are capable of describing a large numbers of substrate that are used for the industrial fermentation process.

	fermentation technology	Have developed an understanding of different types of reactor or fermented which are used for laboratory, pilot and
		Acquired a detail knowledge of number of product which are produced by industrial fermentation process.
		Describing the growth characteristics of the microorganisms capable of growing under unusual environmental condition of temperature, oxygen, and solute activity.
		Differentiating concepts of aerobic and anaerobic respiration
		Learn the different metabolic pathway in microorganisms.
III	Practical course	Acquire laboratory skill.
		very good information of collection of blood sample and blood grouping detection method.
		Apply the practical knowledge to carrying out mini projects.
		Understand the mechanism and application of enzyme produce by microorganism.
		Designed to be flexible incorporating project themes on environment.
		Demonstrate the alcohol fermentation.
<b>Semester IV</b>		
I	Bacterial Genetics	Understood genome organization of model organism namely Ecoli and Saccharomyce and the molecular mechanism that underlies mutation.
		Developed a fairly good knowledge about the three well known mechanisms by which genetic material is transferred among the microorganism namely transformation, transduction, and conjugation.
		Are able to describe different types of the extra chromosomal element or the plasmid, the nature of the transposable element in the prokaryotic and the eukaryotic cells.
		Hands on skill of isolation of plasmid from bacterial cells and its visualization by performing agarose gel electrophoresis.
II	Air, Water, and soil Microbiology	Understand types, structure, formation and microbial flora of soil.
		understand the role of soil, water, air flora in biogeochemical cycle in the environment
		Know about the mechanism and responsibility of microbial interaction with microbes, plant, animal, and insect.

		Know about the defence mechanism, etiology, epidemiology and management various plant diseases cause by microorganism.
		Be familiar with the role of microorganism in nitrogen fixation and know about the types and mode of action of biopesticide.
		Understand the mechanism and application of enzyme produced by soil microorganism.
III	Practical course	Learn to isolate Antibiotic resistant mutant.
		Learn the different method for the isolation and identification soil microorganism.
		Know about the role and methods used for the isolation and identification soil microorganism.
		determine the how to check the potability of water with the help of MPN, Confirmed and complete test and it can be apply at sewage treatment plant and water purification plants.
		Demonstrate the membrane filter technique.
		Understand the isolation of mutant by suitable method.