

Course outcome in Microbiology

After completion of B.Sc in Microbiology course students were known and perform the following :-

B.Sc-I

- Knowing the distribution of Microorganism in nature and their harmful and beneficial activity.
- Cultivation and Isolation of microorganism in nature.
- Diff. types of microorganism and its systemic classification.
- Instruments and microscope used to visualize the diff. microorganism.
- Diff. methods of isolation of pure culture by preparing various types of media.
- Methods of preservation of pure culture.
- Methods for measurement of bacterial growth.
- Know about viruses its classification, structural arrangement, replication, cultivation and Interferon action.
- Various terms used in microbial control.
- Various methods and agents used in microbial control.
- Applied aspects of microbiology in agriculture, environment and various food and dairy industry.
- Basic knowledge of some biochemical like lipid, protein, fat nucleic acid and carbohydrates.
- Basic knowledge of biostatic.
- Basic knowledge of computer and internet.

B.Sc-II

- Knowing basic knowledge of gene, genome genetic code and its properties.
- Knowing the DNA replication and DNA repair mechanism.
- Transformation and translation.
- DNA recombination.
- Various methods used in recombination.
- Gene mutation and types.
- Physical and chemical factors affecting over it.
- Recombinant DNA technology.
- Uses of r-DNA technology in agriculture, healthcare, environment and various food and dairy industry.
- Introduction to epidemiology.
- Normal flora of human body.
- Diseases and its type.
- Mode of transmittion of diseases.
- Immunity and its type.

- Organs involved in Immunity.
- Role of antigen and antibody.
- Diff. serological reaction of antigen and antibody including ELISA and RIA.
- Knowledge of some common disease causing microorganism.
- Knowledge of treating the diff. disease causing microorganism by various agents like antibiotics.
- Methods for choosing correct antibiotic and its concentration by various methods.
- Various chemotherapeutic agents used in various diseases.
- Role of vaccine.

B.Sc-III

- Knowing the different types of microbial association.
- Distribution of microorganism in air and diseases associated with it.
- Etiology, symptoms and prevention of airborne diseases and control.
- Techniques for microbiological analysis of air.
- Knowing the microbiology of soil.
- Understand the role of microorganism to increase the soil fertility.
- Different biogeochemical cycle.
- Decomposition of plant and animal residues.
- Formation of humus and compost.
- Biofertilizers, biological pest control.
- Plankton and eutrophication.
- Bacteriological analysis of water and its importance.
- Diff. methods of analysis as per the standards of ICMR and WHO.
- Purification and various treatments of water.
- Principal and application of various techniques and instruments like spectroscopy, electrophoresis, chromatography and isotopic tracer technique.

Program outcome in B.Sc. Microbiology

B.Sc-I Semester-I

(Fundamentals of Microbiology and Microbial Physiology)

On completion of the course, students are able to:

- Get an idea about the historical discoveries in microbiology
- Understand the diversity in microbiology

- Know the scope of microbiology
- Get the theoretical concepts of related stain
- Understand different methods of staining techniques
- Perform various staining techniques
- Know different type and parts of microscope, and its principal
- Understand the taxonomic classification of microorganisms
- Know anatomy of prokaryotic cell
- Know structural detail of eukaryotic cell
- Understood various parts of cell and its importance
- Understand nutritional requirements of bacterial
- Develop basic skill in aseptic techniques
- Understand various accessories for microbiology practical
- Cultivate bacteria with different cultivation technique
- Understand concepts of growth and reproduction of bacteria
- Know the methods of Preservation of Pure culture.

B.Sc-I Semester-II

(Microbiology, Biochemistry, Biostatistics & Computers)

On completion of the course, students are able to:

- Know viruses, history and structure.
- Replication of viruses, and cultivation techniques.
- Interferon
- Concepts of microbial control
- Mechanism, Physical and Chemical control of microorganism.
- Physical and Chemical agents of microbial control.
- Applied aspects of microbiology in Agriculture, Medical, Industrial & Environmental.
- Basic biochemistry of carbohydrates, lipid, protein and Nucleic Acid.
- Concept of Biostatics.
- Measurement of Mean, Mode and Median Properties.
- Co-relation and linear regression.
- Hypothesis testing.
- Computer concept.

B.Sc-II Semester-III

(Molecular Biology and Genetic Engineering)

On completion of the course, students are able to:

- Know the different concepts of gene.
- DNA replication, DNA repair and concept of genetic code were known.

- Study the DNA manipulating enzymes and the various Vectors.
- Gene regulation and Mutation.
- Gene suppression and Molecular and induces Mutation.
- Bacterial Recombination by various methods.
- Developed a fairly good knowledge about the three well known mechanisms by which genetic material is transferred among the microorganisms namely transformation, transduction and conjugation.
- Have acquired detail knowledge of Genetic engineering gene mapping, PCR and gene cloning.
- Study the application of genetic engineering in various areas like Agriculture, Medical and health, Environmental and Industrial.

B.Sc-II Semester-IV

(Medical Microbiology)

On completion of the course, students are able to:

- Understand the Infection and its type, Epidemiology of disease.
- Normal flora of human body.
- Infection processes and control of communicable diseases.
- Introduction to Immunity and its classification the organs and cells of Immune system.
- Structure of antibody, types of antigen.
- Know the various serological antigen antibody reactions.
- Study of human pathogenic diseases from bacteria, viruses, rickettsias, protozoa and fungi.
- Know the antibiotic and chemotherapeutic agents.
- Study to determine the MIC by various methods as per the CLSI(NCCLS).

B.Sc-III Semester-V

(Environmental Microbiology and Bioinstrumentation)

On completion of the course, students are able to:

Understand various biogeochemical cycles – Carbon, Nitrogen, Phosphorus cycles etc. and microbes involved

B.Sc-III Semester-VI

(Industrial Fermentation, Food Microbiology and Metabolism)

On completion of the course, students are able to:

Are capable of describing a large number of substrate raw material that are used for the

industrial fermentation processes.

Have developed an understanding of different types of reactors or fermenters which are used for laboratory, pilot and industrial scale fermentations and their processes parameters.

Have acquired a detailed knowledge of number of products which are produced by industrial fermentation processes

Understand the beneficial role of microorganisms in fermented foods and in food processing and the microbiology of different types of fermented food products

- Know the spoilage mechanisms in foods and thus identify methods to control of spoilage the food.
- Describe the characteristics of important pathogens and spoilage microorganisms in foods.

- Identify ways to control microorganisms in foods and thus know the principles involving various methods of food preservation

- Acquire, discover, and apply the theories and principles of food microbiology in practical, real-world situations and problems.