THE LEARNING OUTCOME FRAME OF UG AND PG COURSE OF

MICROBIOLOGY

Pso´s of B. Sc. (Microbiology)

1. They can join R&D Department of any pharmaceutical industries.
2. They can work in any Research Laboratory/Institutes (ICMR, NII, CCMB, and any other CSIR Lab) as JRF/ SRF/ RA.
3. After getting degree in Microbiology they can get opportunities in various fields-
   A. Medical Science organizations.
   B. Health care organizations.
   C. Forensic Science Laboratories.
   D. Food Industries.
   E. NGOs

4. They can choose Lectureship and researches in Universities and institutes.

5. They can procure some very prestigious foreign fellowships like commonwealth (UK), DAAD (Germany), etc.

B.Sc. I year

Paper I : General Microbiology and Cell Biology

1. Students get knowledge about history and scope of Microbiology
2. They will learn what is microbes and its several example like bacteria, virus and fungi and their detail.
3. They learn brief knowledge about basic unit of life i.e. cell and cell cycle.
4. They will learn different techniques for isolation of microorganisms and their culture methods and collection methods.

B.Sc. I year

Paper II : Tools and Techniques in Microbiology

1. They will learn about all microbiology and its application.
2. They will be able to learn all instruments which are very useful in Microbiology Laboratory.
3. They will learn all techniques of staining to identify bacteria and other microorganism.
4. They are getting knowledge about sterilization process.
5. They will know about all antimicrobial agent and disinfectant and their uses.

B.Sc. II Year

Paper I : Biochemistry and application of enzymes

1. Students will learn basic properties of carbohydrate protein and lipid.
2. They will learn about enzymes and its application.
3. They will get knowledge about mathematical expression of growth and factors which affect growth of microbes.
4. Student will get knowledge of bioenergetics.
5. They will learn about utilization of energy.
6. They will get knowledge about Electron Transport Chain.

B.Sc. II Year

Paper II : Microbial genetics and Molecular Biology

1. They will get knowledge about DNA in detail.
2. Student will learn about replication and molecular mechanism of chromosomal replication.
3. They will learn basic features of genetic code.
4. Student learns about genetic recombination in bacteria.
5. They learn about mutations and repair system.

B.Sc. III year

Paper I: Applied and environmental microbiology

1. Students will learn about design and types of fermentors.
2. They will learn about Immobilization
3. They will learn about physical and microbial spoilage of food.
4. They will learn about application and production of SCP.
5. Students will learn about microbial interactions.
6. They will learn about bioremediation, biomagnifications, bioleaching, biopesticides and waste water treatment.

B.Sc. III year

Paper II: Immunology and Medical Microbiology

1. Student will learn about types of Immunity, humoral and cell mediated immune response.
2. They will learn about antigen and antibody reaction and how immune system works.
3. They will get knowledge about tumor immunology.
4. They will learn about Immunization
5. They will get knowledge about Host Microbe interaction.

PSO's of M. Sc. Microbiology

1. They can confer various research fellowships like JRF, SRF etc.
2. They can go for Ph. D. Programme.
3. They can work in prestigious Institute and Research laboratories like CSIR labs, NEERI, FRI etc.
4. They can appear to be Scientists in different fields like
   a. Forensic Microbiology
   b. Food Microbiology
   c. Medical Microbiology
   d. Agriculture Microbiology
   e. Environmental Microbiology
   f. Molecular Microbiology
   g. Industrial Microbiology

5. They can open their own NGO's related with Microbiology.
6. They can go for teaching in various colleges like nursing, paramedical etc.

COURSE OUT-COME

M. Sc. Ist Sem

Paper 1 – Bacteriology

1. They will learn about bacterial structure.
2. They will learn about classification of bacteria.
3. They will learn how to identify bacteria by staining techniques.
4. They will learn about extremophillous bacteria and its importance.

Paper 2 – Mycology

1. They will learn about fungal morphology and physiology along with its taxonomy.
2. They will learn about life cycle and different life stages of all the fungi.
3. They will learn about economic importance of fungi.

Paper 3 – Virology

1. They will learn about structure and different types of viruses.
2. They will learn about all viral diseases of plants, animals and human beings.
3. They will learn about serological techniques and viral vaccines.

Paper 4 – Biochemistry

1. They will learn about all macromolecules like carbohydrates, lipids and proteins.
2. They will learn about signal transduction and membrane structures.
3. They will get knowledge of various techniques like chromatography, electrophoresis, spectroscopy along with some advanced techniques like HPLC, SDS PAGE, MASS Spectroscopy, GC MS etc.

M. Sc. IInd Sem

Paper 1 – Molecular Biology And Recombinant DNA Technology

1. They will learn about structure of DNA and RNA along with their replication.
2. They will learn about various strategies of Gene Cloning and construction of genomic library.
3. They will learn about mechanism of mutation and mutagens along with types.
4. They will learn about operon system.

Paper 2 – Biostatistics

1. They will learn about mean, mode, median and other statistical methodology.
2. They will learn about t - test, f - test and central tendency for data analysis.
3. They will learn about computer applications and bioinformatics.

Paper 3 – Microbial Physiology and Metabolism

1. They will learn about metabolism and physiology of bacteria.
2. They will learn about growth patterns in bacteria.
3. They will learn about advantages of bacteria.

Paper 4 – Microbial Genetics

1. They will learn about gene transfer and genetic mapping.
2. They will learn about DNA repair system.
3. They will get knowledge of production of proteins, hormones and design of vaccines.

M. Sc. IIIrd Sem

Paper 1 – Environmental Microbiology

1. They will learn about interaction between microbes and environment.
2. They will learn about waste water treatment by microbes.
3. They will learn how to purify water.
4. They will learn about biological nitrogen fixation.

Paper 2 – Industrial and Food Microbiology

1. They will learn about fermentation technology.
2. They will learn about production of alcohol, enzymes, antibiotics, vitamins at industrial level.
3. They will learn about food and dairy microbiology with food borne diseases.

Paper 3 – Medical Microbiology

1. They will learn about normal microflora of human beings.
2. They will learn about various bacterial, viral and fungal diseases.
3. They will learn about antigens, antibodies and serological techniques.
4. They will get knowledge of various diagnostic methods and prophylaxis of different diseases.

Paper 4 – Agricultural Microbiology

1. They will learn about biofertilizers.
2. They will learn about all techniques which help in farming, GMO, GMP.
3. They will get knowledge of various plant diseases and their control measures.

M. Sc. IV^{rth} Sem

Dissertation work

1. They will get experience about research work and their outcomes.
2. They will get opportunity to work in various reputed research labs for their dissertation work.
3. During dissertation they came into real scientific approach.
4. They will learn scientific writing skills for the thesis, research papers etc.