

OBJECTIVES: To enable the students to

1. Comprehend the diversity of microorganisms.
2. Know the technique of culturing and studying Microorganisms.
3. Understand the applications of microbiology.
4. Understand the organization, replication and economic importance of viruses.

COURSE:

UNIT - I: DIVERSITY OF MICRO ORGANISMS

1. Introduction & History and development of Microbiology
2. Microbial Nutrition & Nutritional classification of bacteria
3. Gene recombination in Bacteria.
4. Ultrastructure of archaea, archaeal cell membrane, other cell structures.
5. Classification of Bacteria – Bergey's manual.

UNIT - II: METHODS IN MICROBIOLOGY – I

Sterilization methods – Terminology of Sterilization, disinfection, antiseptic, sanitization, germicide, microbiostasis, preservative and antimicrobial agents.

- i. Physical control: Temperature (moist heat- autoclave, dry heat- hotair oven & incinerators), dessication, surface tension, osmotic pressure, radiation, UV light, filtration-LAF
- ii. Chemical control: Antiseptics and disinfectants (halogens, alcohol, gaseous sterilization).

UNIT - III: METHODS IN MICROBIOLOGY – II

1. Culturing of Micro-organisms
 - Culture media – Composition & Types
 - Culturing Methods
 - Isolation of pure culture
2. Staining Methods
 - Simple Staining
 - Differential staining by (1) Gram Staining, (2) Acid fast Staining, (3) Endospore Staining.
 - Hanging Drop Method

UNIT - IV: MICROBIAL GROWTH & MEASUREMENT

1. Microbial Growth
 - a. Growth rate & generation time, details of growth curve and its various phases.
 - b. Concept of synchronous cultures, continuous and batch cultures (chemostat and turbidostat).
 - c. Measurement of Growth
2. Pure cultures and culture characteristics. Maintenance and preservation of pure cultures.

UNIT - V: VIROLOGY

1. General characteristics of viruses, Structure, different shapes and symmetries with one example of each type.
2. Classification of viruses on the basis of nucleic acids, phages and animal cell viruses, examples of each and their importance.
3. Replication of Viruses
4. Bacteriophage viruses - Lytic & lysogenic cycles.
5. Structure- TMV, HIV, Hepatitis

REFERENCES:

1. A Text book of Microbiology – By R.C.Dubey, D.K.Maheshwari public. S.Chand 2005
2. Text of Microbiology – By Ananthanarayan and panikes
3. General Microbiology – By R.P.Singh Publi. Kalyan Publication 2005.
4. Microbiology – By cappuceino
5. Practical Microbiology – by Arya
6. Elements of Microbiology Vy Pelezar and Chan public. MCGREW-Hill International, New Delhi.

OBJECTIVES: To enable the students acquire skills necessary to –

1. handle equipment needed for study of microorganisms
2. culture microbial study.
3. identify the staining techniques.

COURSE:

UNIT – I: Microbiological Examination of Organisms

1. Bacteria – E.coli, Streptococcus
2. Algae – Chalmydomonus
3. Fungi – yeast, Penicillium, Aspergillus

UNIT – II: Sterilization – Equipment for sterilization-Hot Air Oven, Autoclave, Laminar air flow chamber.

UNIT – III: Preparation of Culture media :

1. Nutrient Broth
2. Nutrient Agar
3. Macconkey Agar
4. Potato Dextrose Agar

UNIT – IV: Microbial Culture – Methods

1. Inoculation Methods :
 - a. Streak method -
 - i. Streaking on Plates
 - ii. Streaking on Slants
 - b. Serial Dilution
 - c. Pour Plate Method
 - d. Stab Method

UNIT – V: Staining Methods :

1. Simple Staining
2. Differential Staining
 - i. Gram Staining
 - ii. Acid fast staining

UNIT – VI: Microbiological Examination of Water

UNIT – VII: Microbiological Examination of Milk

UNIT – VIII: Bacterial Growth Curve.