

Course Code	Course Name	Credits
26BT003	MICROBIOLOGY	04

Course Objectives

- To learn the contributions of Scientists for the development of Microbiology and Microscopes.
- To equip the students with the real knowledge of working with different types of Microbes.
- Illustrate the basic concepts of microbiology and different microbial identification techniques.
- To impart knowledge on the basic concept of replication in microorganisms.
- To study in detail the growth of microorganisms and impact environment on their growth.

Learning Outcomes

Upon successful completion of this course it is intended that a student will be able to:

- Outline the history of microbiology and microbial staining techniques.
- Infer the basic requirements for microbial growth towards the biosynthesis of important molecules.
- Understand and differentiate the different types of microbes.
- Discuss the controlling mechanism of microorganisms.
- Apply the knowledge to enumerate the microorganisms from natural environment

Unit 1 - Introduction to microbiology (15 Hrs.)

Definition and Scope of Microbiology. History and Recent developments, Contribution of Leeuwenhoek, Louis Pasteur, Robert Koch, ElieMetchinkoff, Edward Jenner and Alexander Fleming. Spontaneous & Biogenesis of Microbiology. Classification of microbes.

Unit 2 – Microscopy and Staining (15 Hrs.)

Simple and compound microscopy, Dark field, Phase contrast, Fluorescence and Electron Microscopy. Stain and staining techniques - Simple, differential, negative, spore staining and special staining.

Unit 3 - Sterilization and Culture Techniques (10 Hrs.)

Microbiological Media: Types, preparation, methods of sterilization. Microbial Nutrition – Heterotrophic, Autotrophic, Growth of Bacteria, Fungus and Viruses, Anaerobic cultivation of bacteria, effect of abiotic factors on growth.

Unit 4 – Cellular structures of prokaryotes (10 Hrs.)

Ultra structure and functions of prokaryotic cell wall, Plasma membrane, Flagella, Pili and Capsule. Biosynthesis of bacterial cell wall, Cell membrane - Biomembrane and Liposomes

Unit 5 - Antimicrobial activity (10 Hrs.)

Antimicrobial chemotherapy –Antibiotics –mode of actions –Antimicrobial resistance - Tests for sensitivity to antimicrobial agents.

Reference Books:

1. M.J. Pelczar Jr. E.C.S. Chan and N.R. Kreig , Microbiology, Tata Macraw Hill, New Delhi.
2. R. Ananthanarayanan. and C.K.JayaramPanickar, Text book of Microbiology, Orient Longman Publications.
3. R.C. Dubey, D.K.Maheswari, A Text book of Microbiology, S.Chand& Company Ltd. New Delhi.
4. Prescott LM, JP Harley and DA Klein, Microbiology. McGraw Hill companies Ltd. 6th Edition, 2005.
5. Robert F Boyd. General Microbiology. Times Mirror / Mosby College publishers. 1984.