

B.Sc. Industrial Microbiology

Syllabus

B.Sc. I

Paper I

Fundamentals of Microbiology

Unit 1. Definition and Scope of Microbiology, History and Development of Microbiology (contribution of pioneers), Golden Era of Microbiology.

Unit 2. Diversity of Microbial World, Prokaryotic cell, Structure of Bacterial cell, Archaeobacteria and Eubacteria, Structure and function of Plasma membrane, cell wall, capsule, flagella, nucleod, plasmid, Gram positive and Gram negative bacteria.

Unit 3. Characteristics of Fungi, Algae, Protozoans, Viruses. Principles of classification of bacteria, algae, fungi, protozoa, viruses.

Unit 4. Methods for studying microorganisms, pure culture techniques, methods of sterilization – physical and chemical, media – types, preservation techniques.

Unit 5. Microbial growth, phases of growth, conditions of growth, measurement of growth, bacterial sporulation and germination, binary fission.

References

1. M J Pelczar, E C S Chan and N R Krieg. Microbiology. Tata McGrawHill.
2. T D Brock. Biology of Microorganisms. Prentice Hall
3. R C Dubey and D K Maheshwari. A Textbook of Microbiology. S.Chand.

Paper II

Microbial Physiology and Biochemistry

Unit 1. Biochemistry of Microbes: Chemical composition of cell, molecules of living systems, pH and pK, Buffers.

Unit 2. Structure and classification of carbohydrates, lipids, proteins, DNA and RNA.

Unit 3. Biosynthesis of bacterial cell wall, transport across membrane, effect of temperature, salinity and oxygen on growth. Anaerobic bacteria, adaptations in extreme conditions.

Unit 4. Enzymes and their classification, Enzyme kinetics, allosteric enzymes, Michaelis- Menten equation, coenzyme, isozyme, enzyme inhibition and regulation.

Unit 5. Microbial photosynthesis, photosynthetic apparatus in pro and eukaryotes, anoxygenic and oxygenic photosynthesis (cyanobacteria and algae). Light and dark reactions.

References:

1. Lehninger. Principles of Biochemistry, Nelson and Cox.
2. J L Jain. Biochemistry. S. Chand.
3. A G Moat, J W Foster and M P Spector. Microbial Physiology. Wiley.

