

**CORE COURSE - VII (CC):
ENVIRONMENTAL MICROBIOLOGY, BIOTECHNOLOGY AND BIOCHEMISTRY**

UNIT 1:

Introduction: Scope of microbiology, structure and reproduction in general - Algae, Fungi, Bacteria, Viruses and Actinomycetes - Sterilization, preparation and maintenance of culture media-Isolation and identification of common Algae, Fungi, Bacteria.

UNIT 2:

Soil microorganisms - Microorganisms in water, algalbloom. Microorganisms in air, origin distribution and estimation. Microorganisms in food and milk, Food poisoning and food preservation. Production of organic compound by microbial fermentation ethanol, citric acid, production of antibiotics by microorganisms-penicillin, Enzyme - Zymase. Disease producing microorganisms - Tikka disease, Red rot of sugar cane, White rust, TMV, cholera, typhoid, dysentery, Jaundice.

UNIT 3:

Importance of biotechnology-Techniques in cells and tissues culture. Applications of cells and tissue culture, regeneration of plants from tissue culture, protoplast isolation and fusion, somatic hybridization.

UNIT 4:

Sewage treatment using microbial systems,-Bioremediation of waste water-eg.,Heavy metal. Energy and fuel using microorganisms - hydrogen production using hydrogenase and nitrogenase, hydrocarbon production. Use of mycorrhizae in reforestation,biofertilizers.Use of microbes for improving soil fertility, current levels of biodiversity. Steps to preserve biodiversity, insitu and exsitu conservation, Gene banks, and species conservation.

UNIT 5:

Structure and functions of carbohydrates, proteins and lipids. Metabolism - Glycolysis, Citric acid cycle, Electron transport, Oxidative phosphorylation and regulation of ATP production. Oxidation of fatty acids and amino acids, Urea cycle. Biosynthesis of Carbohydrates, lipids and aminoacids in animal tissues.

REFERENCES

1. Agarwal.K.C.1998, Biodiversity, Agro Botanica, New Delhi.
2. Ambika Shanmugam.1998.Fundamentals of Biochemistry for medical students. Kartik offset printers, Chennai.
3. Atlas R.M. 1984. Microbiology, Fundamentals and applications. Macmillan Publishing Co., New York.
4. Gupta P.K.1994. Elements of biotechnology. Rastogi Company. Meerut.
5. Ignacimuthu.S, 1998. Basic Biotechnology. Tata McGraw-Hill Co limited, New Delhi.
6. Keshar, T .1990. Biotechnology, Wiley eastern Ltd., New Delhi.
7. Kumerasan V. 1994. Biotechnology. Saras publication. Kanyakumari.
8. Lehninger A.L. 1982. Principles of Biochemistry .CBS Publishers and Distributors. Delhi.
9. Pelczer, M.J, Chan. E.C.S and N.R. Krieg. 2001. Microbiology. Tata McGraw-Hill Publishing Company limited, NewDelhi.
10. Purohit, M. 1990. Fundamentals of biotechnology. Agro botanical publishers, Bikaner.
11. Ranganatha Rao. Text Book of Biochemistry, Prentice Hall, India.
12. Ross F.C. 1986.Introductory microbiology. Charles E. Mermill publishing company.
13. Schlegel N.G. 1986. General Microbiology. Cambridge University Press, U.K.