

GUJARAT TECHNOLOGICAL UNIVERSITY

B.E. Semester: IV

Environmental Science and Technology

Subject Code: 143503

Subject Name: Environmental Bioscience

Sr. No.	Course contents
01.	Introduction of microbiology. Characteristics and classification of microbes, role of microbes in environment. Bacteria, enzymes, algae, fungi, protozoa, virus and other microbes.
02.	The growth and reproduction of microbe, Prokaryotes and uses. Microbiology of soil, air, water, food, milk etc. Hygiene, sanitation and diseases.
03.	Introduction to biochemistry, Chemistry of Biologically Important Molecules (Carbohydrate, Protein, Amino acids, Lipids and fats).
04.	Water in biological systems. Protein structure and biological functions, enzymes, enzyme metabolism, biosynthesis of DNA and RNA and mutations.
05.	Introduction to biotechnology, biochemical terminology, Enzymes as biocatalysts, enzyme biosynthesis and regulation. Application of biotechnology to Chemical industry and in environmental engineering.
06.	Advanced techniques in environmental biotechnology: R-DNA, plasmids, cutting and joining of DNA, Bioremediation of various air/water pollutants, Isolation and cultivation of important microorganisms, role of micro organisms in bioremediation. Biogas technology- conditions for biogas production, biogas plant and commercial, laboratory type. Biogas from wastewater. Methane production through anaerobic fermentation.

References:

1. Food Microbiology, Pelzar M J Reid R D , Mc Graw Hill Book Company, 1988
2. Environmental Microbioloty Mitchell R, Mc Graw Hill Book Company,
3. Principles of Biochemistry, Lehninger, Freeman & Company, 5th Ed, 2008
4. J Biochemistry, M Tymoczko, J L & Styrer L Berg, 6th Ed, 2007
5. Microbiology Fundamentals and Applications, Purohit S S, 4th Ed, 1999
6. Microbiology for Environmental Engineering, Mc Kinnery, McGraw Hill, New York, 2000