

SARDAR PATEL UNIVERSITY
Programme: MSC (Integrated Biotechnology)
Semester: III
Syllabus with effect from: June 2011

Paper Code: PS03CIGB04	Total Credits: 3
Title Of Paper: Microbiology - II	

Unit	Description in detail	Weightage (%)
1	<p>Classification of Microorganisms: Whittaker's Five-kingdom concept, Criteria used in classification of Bacteria, Taxonomy hierarchy, Introduction to Bergey's manual</p> <p>Methods of Classification: Phenotypic classification, Numerical classification, Molecular based classification, Base composition, Nucleic acid hybridization, rRNA cataloguing, Fatty acid profile</p> <p>Bacterial phylogeny: Molecular chronometer, Phylogenetic tree-based on 16S rRNA</p>	
2	<p>Medical Microbiology: Normal flora of human body & gnotobiotic life, Infection and its types, Virulence – Factors affecting virulence, Occurrence and transmission of disease, Host-defense mechanism, Classification and types of human diseases caused by Bacteria, Fungi, Virus and Protozoans (Typhoid, Mycosis, Poliomyelitis, Malaria)</p>	
3	<p>Soil, Food and Milk Microbiology: Soil as a microbial habitat, Rhizosphere, Mineralization and immobilization of nutrients via Carbon, Nitrogen, Phosphorus and Sulphur cycles, Concept of biofertilizers - Types, Classification, Mechanisms and Applications Microbial flora of fresh foods, Microbial spoilage of food, Preservation of foods, Fermented foods and single-cell protein. Milk Microflora, Pasteurization, Qualitative and Quantitative Analysis of Milk, Milk products developed using microorganisms</p>	
4	<p>Freshwater, Wastewater and Air Microbiology: Water Micro flora, Qualitative and Quantitative Analysis of Water, Potability ratio, BOD .Chemical and Microbial characteristics of wastewater, Wastewater treatment processes. Air microflora, Qualitative and quantitative methods for assessment of air micro flora, Air sanitation</p>	
	Practical:	
	<ul style="list-style-type: none"> • Isolation of Nitrogen fixers (Rhizobium, Azotobacter) and Phosphate solubilizers from soil. • Isolation of Antibiotic producing Bacteria by Crowded Plate Technique / Wilkin's Method. • Qualitative and quantitative Analysis of Water sample . • BOD studies of sewage sample . • Qualitative and quantitative Analysis of Milk including Methylene Blue Reduction Test .(MBRT) • Isolation and characterization of Microorganisms from contaminated food. • Qualitative and quantitative determination of Air microflora . 	



Basic Text & Reference Books:

- Brock - Biology of Microorganisms, Michael T. Madigan, Jhon M. Martinkko and Jack Parker. (1997). 9th Ed. Prentice Hall International Inc, London.
- Fundamental Principles of Bacteriology. (7th edition).A J Salle, Tata McGraw-Hill publishing company Ltd, New Delhi. ISBN-10: 1406707376 , ISBN-13: 978-1406707373
- General Microbiology, Stanier RY, Adelberg, E.A., Ingraham, J.L., 5th Ed. Wheelis M.L.and Painter P.R. McMillan Press
- Microbiology by Pelczar, Michael J./ Chan, E.C.S./ Krieg, Noel R./ Chan, E. C. S. Publ: Tata McGraw-Hill Publishing Company Limited New Delhi, 2004 , Fifth edition
- Microbiology: Concepts and Applications, Michael J. Pelczar E. C. S. Chan Noel R. Krieg (ISBN: 0070492581), McGraw-Hill Company
- Prescott, Harley, and Klein's microbiology Publ : McGraw-Hill Higher Education New York, Seventh edition ISBN-10: 0073302082
- Laboratory Exercises In Microbiology by E.C.S. Chan, Jr., Michael J Pelczar and Noel R Krieg Publisher: McGraw-Hill Science/Engineering/Math; 6th edition (1993) ISBN-10:0070492646
- Microbiology-A laboratory manual, (4th edition), James G. Cappuccino and Natalie Sheman.(1996) The Benjamin/Cummings publishing company Inc, California.
- Bergey's Manual of Systematic Bacteriology, 9th Ed. William & Wilkins, Baltimore, Holt J.S., Krieg N.R., Sneath P.H.A. and Williams S.T (1994).
- Experimental Microbiology Volume 1 and 2 by Patel, Rakesh J. Aditya Publisher, 2004.

