

# GUJARAT TECHNOLOGICAL UNIVERSITY

B.Pharm

SEMESTER: V

**Subject Name: Pharmaceutical Microbiology & Biotechnology – II**

**Subject Code: 2250002**

Teaching Scheme				Evaluation Scheme			
Theory	Tutorial	Practical	Total	Theory		Practical	
				External	Internal	External	Internal
3	0	3	6	80	20	80	20

## Theory

Sr No	Course Contents	Total Hrs
1	Introduction and Scope of Microbiology	2
2	General microbiology: <ul style="list-style-type: none"> <li>a) Microscopy                             <ul style="list-style-type: none"> <li>• Light Microscopy (Bright Field, Dark field &amp; Phase contrast, Fluorescent, Differential interference )</li> <li>• Electron Microscopy (SEM &amp; TEM)</li> </ul> </li> <li>b) General Structure                             <ul style="list-style-type: none"> <li>• Prokaryotic and Eukaryotic Cell</li> </ul> </li> <li>c) Brief over view of 3 kingdom Classification system</li> <li>d) Structure and Taxonomy of Actinomycetes, Bacteria, Spirochetes, Rickettsia and Viruses, fungus with emphasis on pathogenic and pharmacological importance.</li> <li>e) Identification of microbes                             <ul style="list-style-type: none"> <li>• Staining Techniques</li> </ul> </li> <li>f) Nutritional requirements                             <ul style="list-style-type: none"> <li>• Nutrition requirements, Growth curve</li> <li>• Introduction to various nutritional media,</li> <li>• Cultivation and Isolation of bacteria, virus and fungus.</li> </ul> </li> <li>g) Bacterial count techniques</li> </ul>	19
3	Control of microbes in pharmaceutical industry <ul style="list-style-type: none"> <li><b>a. Disinfection:</b> <ul style="list-style-type: none"> <li>• Classification, mode of actions and Factor affecting Disinfection</li> <li>• Dynamics of Disinfection</li> <li>• Evaluation of Disinfection</li> </ul> </li> <li><b>b. Sterilization:</b> <ul style="list-style-type: none"> <li>• Introduction, significance, sensitivity of microorganisms,</li> <li>• Detailed methods for sterilization processes.</li> <li>• Sterilization control and sterility assurance.</li> </ul> </li> </ul>	14
4	Introduction of DNA & RNA, details of Genetic code and protein synthesis Introduction and scope of Biotechnology	06
5	Immobilization of Enzymes: <ul style="list-style-type: none"> <li>• Techniques of immobilization</li> </ul>	04

	<ul style="list-style-type: none"> <li>• Factors affecting enzyme kinetics</li> <li>• Applications</li> </ul>	
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### PRACTICAL – 22500P2

1.	Introduction to Pharmaceutical Microbiology practical
2.	Preparation of Various Media
3.	Sub culturing of Common Bacteria (Aerobic and Anaerobic)
4.	Staining of Microorganism (Monochrome staining, Gram staining, acid fast staining etc)
5.	Methods of Isolation
6.	Study of Sterilization and Their Validation
7.	Viable Counts and total counts by various methods
8.	Evaluation of the disinfectants
9.	Maintenance and preservation of pure culture

#### References Books:

1. Textbook of Microbiology by Tortora.
2. Pharmaceutical Microbiology, sixth edn, edited by W. B. Hugo and A. D. Rusell Blackwell science.
3. Principles of Microbiology, Ronald M. Atlas. Second edn. W. C. Brown Publishers.
4. Bergeys manual of Systematic Bacteriology, Williams and Wilkins- A Waverly company.
5. Disinfection, Sterilization and Preservation. Fourth edn, Seymour S. Black. Lea and Febiger Philadelphia, London.
6. Industrial Microbiology. Fourth edn, Prescott and Dunn. CBS Publishers and Distributors.
7. Principles of Fermentation Tehchnology. Second edn. P. F. Stanbury, A. Whiteshaker and S. J. Hall Aditya Books Pvt Ltd. New Delhi.
8. Microbiology, Pelczar/Chan Kreig Tata McGraw Hill edn.
9. Industrial Microbiology L.E. Casida, Jr. New age International Publishers.
10. Fundamental Principles of Bacteriology. A. J. Sale, Tata McGraw Hill Publishing Company Ltd.
11. Fundamentals of Microbiology by Forbischer.
12. Bentleys Text book of Pharamceutics.
13. Dispensing Pharmacy by Cooper and Gunn, Twelfth edn.
14. Remington Pharmaceutical Science, Latest edn.
15. Microbiology by Ronald Atlas.