

**GUJARAT TECHNOLOGICAL UNIVERSITY**  
**BACHELOR OF PHARMACY**  
**Semester: VI**

Subject Name: **Pharmaceutical Microbiology and Biotechnology-II**

Subject Code: **260002**

<b>Sr. No.</b>	<b>Course contents</b>	<b>Teaching Hours</b>
<b>1.</b>	Introduction to biotechnology	2
<b>2.</b>	Microbial genetics and variation	6
<b>3.</b>	<b>Genetic recombination:</b> transformation conjugation a. Protoplast fusion, gene cloning and their applications, monoclonal antibodies b. Study of drug produced by biotechnology, viz. activase, humulin, Hb tec.	8
<b>4.</b>	<b>Immunology and Immunological Preparation:</b> a. Immunity, primary and secondary defense mechanism, interferon b. Principles of immunology, antigen antibody reactions and application, preparations of vaccines, toxoids. Standardization and storage	12
<b>5.</b>	<b>Fermentation Techniques:</b> a. Screening of organism, preparation and preservation of master culture, design of fermentor, various parameters and media used for fermentation b. Recovery of fermentation products Flowsheets penicillin, streptomycin, Vit. B <sub>2</sub> , Vit. B <sub>12</sub>	10
<b>6.</b>	<b>Immobilization of Enzymes:</b> a. Techniques of immobilization b. Factors affecting enzyme kinetics c. Applications	4

**Pharmaceutical Microbiology and Biotechnology-II – Practical 3hr\week**

1. Microbiological assay of antibiotics
2. Preparation of vaccines
3. Standardization of vaccines
4. Preparation of mutant
  - a. Gradient plate method
  - b. Velvet replicate method
5. Design of fermentor
6. Study of shake flask technique
7. Production of alcohol using Bakers yeast
8. Extraction of citric acid from fermented mass

### **Books Recommended:**

1. Textbook of microbiology by Tortora.
2. Pharmaceutical microbiology, sixth edn, edited by W. B. Hugo and A. D. Russell  
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. Block. Lea and  
Febiger Philadelphia, London
6. Industrial microbiology. Fourth edn, Prescott and Dunn. CBS publishers and distributors
7. Principles of fermentation technology. Second edn. P. F. Stanbury, A. Whitshaker 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. Remington Pharmaceutical Science, latest edn
13. Microbiology by Ronald Atlas