

Syllabus

Unit I

1. Brief introduction to Biotechnology with reference to Pharmaceutical Sciences.
2. Enzyme Biotechnology- Methods of enzyme immobilization and applications.
3. Biosensors- Working and applications of biosensors in Pharmaceutical Industries.
4. Brief introduction to Protein Engineering.
5. Use of microbes in industry. Production of Enzymes - General consideration - Amylase, Catalase, Peroxidase, Lipase, Protease, Penicillinase.
6. Basic principles of genetic engineering.

Unit II

1. Study of cloning vectors, restriction endonucleases and DNA ligase.
2. Recombinant DNA technology. Application of genetic engineering in medicine.
3. Application of r DNA technology and genetic engineering in the production of: i) Interferon ii) Vaccines- hepatitis- B iii) Hormones-Insulin.
4. Brief introduction to PCR

Unit III

Types of immunity- humoral immunity, cellular immunity

1. Structure of Immunoglobulins
2. Structure and Function of MHC
3. Hypersensitivity reactions, Immune stimulation and Immune suppressions.
4. General method of the preparation of bacterial vaccines, toxoids, viral vaccine, antitoxins, serum-immune blood derivatives and other products relative to immunity.
5. Storage conditions and stability of official vaccines
6. Hybridoma technology- Production, Purification and Applications
7. Blood products and Plasma Substitutes.

Unit IV

1. Immuno blotting techniques- ELISA, Western blotting, Southern blotting.
2. Genetic organization of Eukaryotes and Prokaryotes
3. Microbial genetics including transformation, transduction, conjugation, plasmids and transposons.
4. Introduction to Microbial biotransformation and applications.
5. Mutation: Types of mutation/mutants.

Unit V

1. Fermentation methods and general requirements, study of media, equipments, sterilization methods, aeration process, stirring.
2. Large scale production fermenter design and its various controls.
3. Study of the production of- penicillins, citric acid, Vitamin B12, Glutamic acid, Griseofulvin,
4. Blood Products: Collection, Processing and Storage of whole human blood, dried human plasma, plasma substitutes.

Pharmaceutical Biotechnology

Contents

<i>Preface</i>	<i>v</i>
<i>Acknowledgement</i>	<i>vii</i>
<i>Syllabus</i>	<i>ix</i>
1. Introduction to Biotechnology	1
2. Enzyme Biotechnology	4
3. Biosensors	18
4. Protein Engineering.....	21
5. Cloning Vectors and Enzymes	25
6. Recombinant DNA Technology	31
7. Polymerase Chain Reaction	38
8. Immunity	42
9. Hypersensitivity Reactions	52
10. Vaccines and Sera.....	58
11. Hybridoma Technology.....	68
12. Blood Products and Plasma Substitutes	72
13. Immunoblotting Techniques.....	81
14. Genetic Organization of Eukaryotes and Prokaryotes	86
15. Microbial Genetics	89
16. Microbial Biotransformation.....	97
17. Mutation	102
18. Fermentation	106
19. Production of Pharmaceuticals.....	116
<i>References</i>	<i>123</i>