

18BP070

PHARMACEUTICAL BIOTECHNOLOGY

Hours Per Week :

L	T	P	CP	CL
3	1	-	-	4

Total Hours :

L	T	P	WA/RA	SSH/SHS	CS	SA	S	BS
45	1	-						

SCOPE:

Biotechnology has a long promise to revolutionize the biological sciences and technology. Scientific application of biotechnology in the field of genetic engineering, medicine and fermentation technology makes the subject interesting. Biotechnology is leading to new biological revolutions in diagnosis, prevention and cure of diseases, new and cheaper pharmaceutical drugs. Biotechnology has already produced transgenic crops and animals and the future promises lot more. It is basically a research-based subject.

COURSE OUTCOMES:

Upon completion of the course, the student will be able to achieve the following outcomes:

COs	Course Outcomes	POs	PSOs
1	Understand the importance of immobilized enzymes in pharmaceutical industries	1, 4	1
2	Genetic engineering application in relation to production of pharmaceuticals	1, 4	1
3	Importance of monoclonal antibodies in industries	1, 4	1
4	Appreciate the use of microorganisms in fermentation technology	1, 4	1

UNIT - I **10HOURS**

- a) Brief introduction to Biotechnology with reference to Pharmaceutical Sciences.
- b) Enzyme Biotechnology- Methods of enzyme immobilization and applications.
- c) Biosensors- Working and applications of biosensors in Pharmaceutical Industries.
- d) Brief introduction to Protein Engineering.
- e) Use of microbes in industry. Production of Enzymes- General consideration - Amylase, Catalyse, Peroxides, Lipase, Protease, Penicillin's.
- f) Basic principles of genetic engineering.

UNIT - II **10HOURS****STUDY OF CLONING VECTORS, RESTRICTION ENDO NUCLEASES AND DNA LIGASE.**

- a) Recombinant DNA technology. Application of genetic engineering in medicine.
- b) Application of r DNA technology and genetic engineering in the production of:
 - I) Interferon ii) Vaccines - hepatitis- B iii) Hormones-Insulin.
- c) Brief introduction to PCR

UNIT - III **10HOURS****TYPES OF IMMUNITY- HUMORAL IMMUNITY, CELLULAR IMMUNITY**

- a) Structure of Immuno globulins
- b) Structure and Function of MHC
- c) Hypersensitivity reactions, Immune stimulation and Immune suppressions.
- d) General method of the preparation of bacterial vaccines, toxoids, viral vaccine, antitoxins, serum-immune blood derivatives and other products relative to immunity.
- e) Storage conditions and stability of official vaccines
- f) Hybridoma technology- Production, Purification and Applications
- g) Blood products and Plasma Substitutes.

UNIT - IV **08HOURS**

- a) Immuno blotting techniques- ELISA, Western blotting, Southern blotting.
- b) Genetic organization of Eukaryotes and Prokaryotes
- c) Microbial genetics including transformation, transduction, conjugation, plasmids and transposes.
- d) Introduction to Microbial biotransformation and applications.
- e) Mutation: Types of mutation/mutants.

UNIT - V **07HOURS**

- a) Fermentation methods and general requirements, study of media, equipments, sterilization methods, aeration process, stirring.
- b) Large scale production fermented design and its various controls.
- c) Study of the production of - penicillin's, citric acid, Vitamin B12, Glutei acid, Griseofulvin,
- d) Blood Products: Collection, Processing and Storage of whole human blood, dried human plasma, plasma Substitutes.

RECOMMENDED BOOKS (LATEST EDITION):

1. B.R. Glick and J.J. Pasternak: Molecular Biotechnology: Principles and Applications of Recombinant DNA: ASM Press Washington D.C.
2. RA Gold shies ET. al., Kuby Immunology.
3. J.W. Gooding: Monoclonal Antibodies.
4. J.M. Walker and E.B. Gin gold: Molecular Biology and Biotechnology by Royal Society of Chemistry.
5. Zagorsk: Immobilized Enzymes, CRC Press, Degraland, Ohio.
6. S.B. Primrose: Molecular Biotechnology (Second Edition) Blackwell Scientific Publication. Stan bury F., P., Whitaker A., and Hall J., S., Principles of fermentation technology, 2nd edition, Adyta books Ltd., New Delhi.

