PANIPAT INSTITUTE OF ENGINEERING AND TECHNOLOGY, PANIPAT

DEPARTMENT OF PHARMACY

Course: Bachelors of Pharmacy

LESSON PLAN

Faculty Name: Palika Sehgal **Subject Name: Pharmaceutical Biotechnology**

Class: B. Pharmacy – 6th Sem **Subject Code: BP 605 T**

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 promise lot more.
- It is basically a research-based subject.

OBJECTIVES: Upon completion of the subject student shall be able to:

- Understanding the importance of Immobilized enzyme in Pharmaceutical Industries.
- Genetic Engineering application in relation to production of pharmaceuticals.
- Importance of monoclonal antibodies in Industries.
- Appreciate the use of microorganisms in fermentation technology.

Number of Lectures: 45 **Each lecture**: 01 hour

Lecture No.	Particular	Remark/Date
Module 1:		
1.	Introduction of Biotechnology with reference to Pharmaceutical Sciences.	
2.	Enzyme Biotechnology-**Methods of enzyme Immobilization and Applications.**	
3.	Introduction of Biosensors Working	
4.	Application of Biosensors in Pharmaceutical Industries	
5.	Introduction of Protein Engineering	
6.	Use of Microbes in Industry	
7.	Production of Enzymes- **General consideration-Amylase,**	
8.	Production of Enzymes- **General consideration- Catalase, Peroxidase**	

9.	Production of Enzymes- **General consideration- Lipase, Protease**	
10.	Production of Enzymes- **General consideration- Penicillinase**	
Module 2:		
11.	Study of Cloning Vectors	
12.	Study of Restriction Endonucleases	
13.	DNA Ligases	
14.	Application of r DNA technology and genetic Engineering in the production of: **INTERFERONS**	
15.	Application of r DNA technology and genetic Engineering in the production of: **INTERFERONS**	
16.	Application of r DNA technology and genetic Engineering in the production of: **VACCINES-HEPATITIES**	
17.	Application of r DNA technology and genetic Engineering in the production of: **VACCINES-HEPATITIES**	
18.	Application of r DNA technology and genetic Engineering in the production of: **HORMONES-INSULIN**	
19.	Application of r DNA technology and genetic Engineering in the production of: **HORMONES-INSULIN**	
20.	Introduction to PCR	
Module 3:		
21.	Introduction to the type of Immunity – **Humoral Immunity , Cellular Immunity**	
22.	Structure of Immunoglobulins	
23.	Structure and Function of MHC	
24.	Hypersensitivity reactions, immune stimulation and Immune suppressions.	
25.	General methods of the preparation of bacterial- **Vaccines , Toxoids,**	
26.	General methods of the preparation of - **Viral vaccine, Antitoxins**	
27.	General methods of the preparation of -**Serum-Immune blood derivatives and other products relative to immunity.**	
28.	Storage conditions and Stability of Official Vaccines	
29.	Hybridoma technology-**Production, Purification and Applications**	
30.	Blood products and Plasma Substitutes.	
Module 4:		
31.	Immuno Blotting Techniques- ELISA, Wester Blotting,	
32.	Immuno Blotting Techniques- Southern Blotting	
33.	Genetic organization Of Eukaryotes and Prokaryotes.	
34.	Microbial genetics including transformation, transduction,	
35.	Conjugation, Plasmids and transposons.	
36.	Introduction to Microbial Biotransformation and applications.	
37.	Mutation :**Types of Mutation/Mutants**	
38.	Mutation :**Types of Mutation/Mutants**	
Module 5:		
39.	Fermentation methods and general requirements, study of media,	
40.	Equipments, Sterilization methods, aeration process, stirring.	
41.	Large scale production fermenter design and its various controls	
42.	Study of the production of –**Penicillins ,Citric acid, Vitamin B12,**	
43.	Study of the production of- **Glutamic acid, Griseofulvin**	

44.	Blood Products: **Collection, Processing and Storage of whole human blood,**	
45.	Blood Products: **Dried human plasma, Plasma Substitutes**	
Revision		
46.	Revision of previous question papers	
47.	Revision of previous question papers	
48.	Revision of previous question papers	
49.	Revision of previous question papers	
50.	Revision of previous question papers	

Teacher in-charge **HOD** **Principal**