St.James College of Pharmaceutical Sciences

St.James medical Academy

River Bank, Chalakudy

Programme:	B.PHARM	Sem.:	VI
Name of Course: (*Subject*)	PHARMACEUTICAL BIOTECHNOLOGY	Course Code:	BP605T
Teaching faculty of the course	Mrs. Amala Fetcy K Mrs. Kavitha V B		

Summary of the Lecture Plan

Topic	Lectures	Hours
UNIT I	Brief introduction to Biotechnology with reference to Pharmaceutical Sciences.	1
	Enzyme Biotechnology	2
	Biosensors	2
	Brief introduction to Protein Engineering.	2
	Use of microbes in industry.	2
	Basic principles of genetic engineering	1

UNIT II	cloning vectors, restriction endonucleases and DNA ligase.	2
	Recombinant DNA technology	2
	Application of r DNA technology and genetic engineering	2
	PCR	2
	Types of immunity	2
UNIT III	Immunoglobulins	1
	MHC	1
	Hypersensitivity reactions, Immune stimulation and Immune suppressions.	2
	bacterial vaccines, toxoids, viral vaccines, antitoxins, serum-immuno blood derivatives and other products relative to immunity.	2
	official vaccines	2
	Hybridoma technology	2
UNIT IV	Immuno blotting techniques	2
	Microbial genetics	3
	Microbial biotransformation and applications.	3
	Mutation	1

UNIT V	Fermentation methods	1
	Large scale production fermenter design	1
	Blood products	2
	penicillins, citric acid, Vitamin B12, Glutamic acid, Griseofulvin	2

Major issues or Core aspects to be addressed/ covered:

UNIT I
Brief introduction to Biotechnology with reference to Pharmaceutical Sciences.
Enzyme Biotechnology- Methods of enzyme immobilization and applications
Working and applications of biosensors in Pharmaceutical Industries.
Brief introduction to Protein Engineering
Use of microbes in industry
Production of Enzymes- General consideration - Amylase, Catalase, Peroxidase, Lipase, Protease, Penicillinase.
Basic principles of genetic engineering.
UNIT II
Study of cloning vectors, restriction endonucleases and DNA ligase.

Recombinant DNA technology. Application of genetic engineering in medicine
Application of rDNA technology and genetic engineering in the products: i) Interferon ii) hepatitis- B vaccine iii) Insulin hormone.
Brief introduction to PCR
Types of immunity- humoral immunity, cellular immunity
UNIT III
Structure of Immunoglobulins
Structure and Function of MHC
Hypersensitivity reactions
Immune stimulation and Immune suppressions.
General method of the preparation of bacterial vaccines, toxoids, viral vaccines, antitoxins
serum-immuno blood derivatives and other products relative to immunity.
Storage conditions and stability of official vaccines
Hybridoma technology- Production, Purification and Applications
UNIT IV
Immuno blotting techniques- ELISA, Western blotting, Southern blotting.

Microbial genetics including transformation, transduction, conjugation, plasmids and transposons.
Introduction to Microbial biotransformation and applications.
UNIT V
Mutation --Types of mutation/mutants
Fermentation methods and general requirements, study of media, equipments, sterilization methods, aeration process, stirring.
Large scale production fermenter design and its various controls.
Study of the production of - penicillins, citric acid, Vitamin B12, Glutamic acid, Griseofulvin,
Collection, Processing and Storage of whole human blood, dried plasma, plasma substitutes

Sample Questions

UNIT I
Explain the methods of enzyme immobilization and applications.
Give a note on Biosensors.
Protein Engineering.

Briefly explain the production of penicillinase, amylase and lipase.
Briefly explain the production of peroxidase and protease.
Note on genetic engineering
UNIT II
Explain restriction endonuclease and DNA ligase.
Cloning vectors
Recombinant DNA technology
Explain the production of Interferon, hepatitis- B vaccine, Insulin hormone
PCR
Define immunity? types.
UNIT III
Immunoglobulins
Structure and Function of MHC
Viral vaccines with suitable examples
Bacterial vaccines with examples

Explain Hybridoma technology
Polio vaccine
BCG vaccine
UNIT IV
ELISA
Explain Western blotting, Southern blotting.
Note on transformation, transduction and conjugation of microbes
plasmids and transposons.
Microbial biotransformation and applications.
UNIT V
Types of mutation and mutants
Note on fermentation equipment and sterilization methods
Method of production of penicillin and citric acid
Whole human blood
Plasma and plasma substitutes