

GARDEN CITY UNIVERSITY

SEMESTER- IV B.Sc. Biotechnology, Biochemistry, Genetics

COURSE TITLE: RECOMBINANT DNA TECHNOLOGY

COURSE CODE : 02BBGR17411

CREDITS : 04

Unit 1: Introduction to rDNA Technology

- 1.1 Introduction to Genetic engineering and recombinant DNA technology.
- 1.2 Steps involved in rDNA technology.
- 1.3 Enzymes used in rDNA
- 1.4 Vectors

Unit 2: Cloning Strategies

- 2.1 Construction of genomic libraries and cDNA Libraries.
- 2.2 Screening libraries by colony hybridization and colony PCR.
- 2.3 Introduction of rDNA into living cells.
- 2.4 Selection, screening and analysis of recombinants.

Unit 3: Molecular Techniques

- 3.1 Hybridization techniques: Southern; Northern; Western; Dot blots and slot blot.
- 3.2 Molecular probes, labelling of probes with radioisotopes and non radio labeling of probes.
- 3.3 DNA sequencing: Sanger and Coulson; Maxam Gilbert method.
- 3.4 DNA Fingerprinting and PCR techniques.

Unit 4: Applications

- 4.1 Production of recombinant Insulin, Growth hormones, Interferons and vaccines.
- 4.2: Applications of rDNA in medicine.
- 4.3 Transgenic plants.
- 4.4 Transgenic animals.

COURSE TITLE: IMMUNOLOGY

CODE: 02ABBGR17412

CREDITS : 04

Unit 1

- 1.1 Immunity & immune system
- 1.2 Components of immune system
- 1.3 Antigen and antibodies
- 1.4 Complement system
- 1.5 Types of immune response and Immunological tolerance

Unit 2

- 2.1 Interaction between antigens and antibodies: Nature of antigen- antibody reactions.
- 2.2 Mechanisms of autoimmunity

Unit 3

- 3.1 Hypersensitivity reactions: Types, symptoms and diagnosis.
- 3.2 Characteristics, types and functions of Lymphokines and cytokines.

Unit – 4

- 4.1 Major histocompatibility and their role in immune response
- 4.2 An overview of tissue transplantation
- 4.3 Immunology of cancer: Role of immune system in the development of cancer

COURSE TITLE: HUMAN BIOMEDICAL GENETICS

COURSE CODE:02ABBGR17413

CREDITS: 04

Unit 1: CLINICAL METHODS OF GENETIC ANALYSIS

- 1.1 Dermatoglyphics
- 1.2 Prenatal Diagnosis
- 1.3 Pedigree Analysis and Genetic Counselling
- 1.4 Gene therapy

Unit 2: GENETIC DISORDERS

- 2.1 Single Gene Disorders:
- 2.2 Multigene Disorders (Multiple Sclerosis, hypertension, Cleft lip)
- 2.3 Multifactorial Inheritance
- 2.4 Metabolic Disorders (PKU, Alkaptonuria)

Unit 3: ONCOGENE AND EPIGENETICS

- 3.1 Cell cycle and regulation, features of a cancer cell
- 3.2 Genes involved - Tumour Suppressor Genes, Protooncogenes, Oncogenes and cellular oncogenes
- 3.3 Classification of Cancer
- 3.4 Cancer diagnosis and treatment

3.5 Epigenetics

Unit 4: IMMUNOGENETICS, GENETICS AND SOCIETY

4.1 Immunodeficiency

- 4.2 Autoimmune disorders

4.3 Transplantation

4.4 Human Genome Project

4.5 Stem cells