LESSON PLAN

Discipline: B.Tech in Biotechnology
Semester: 5th
Subject: BTPC3003 – Immunology and Immunotechnology
No. of Days/Week: 3
Semester Duration: July – December
No. of Weeks: 17
Name of the Teaching Faculty: DR. SUSMITA MAHAPATRA

Week	Class Day	Theory Topics
1st	1st	Introduction to Immunology & Phylogeny of the Immune System
	2nd	Innate and Acquired Immunity
	3rd	Innate and Acquired Immunity
2nd	1st	Clonal Nature of Immune Response
	2nd	Clonal Nature of Immune Response
	3rd	Hematopoiesis: Origin of Immune Cells
3rd	1st	Lymphocytes & Phagocytic Cells
	2nd	Signals for Lymphocyte Lineage Commitment
	3rd	Signals for Lymphocyte Lineage Commitment
4th	1st	Organization and Structure of Lymphoid Organs
	2nd	Elements of Immunity – B & T Lymphocytes
	3rd	Activation and Regulation of B and T cells
5th	1st	Nature and Biology of Antigens
	2nd	Superantigens
	3rd	Complement System – Components and Pathways
6th	1st	Complement System – Components and Pathways
	2nd	Immunoglobulins – Structure, Classes, Subclasses
	3rd	Immunoglobulins – Structure, Classes, Subclasses
7th	1st	Expression & Organization of Immunoglobulin Genes
	2nd	Gene Rearrangement & Antibody Diversity
	3rd	Gene Rearrangement & Antibody Diversity
8th	1st	T Cell Receptor (TCR) – Structure & Function
	2nd	Antigen Processing and Presentation
	3rd	Role of APCs (Antigen Presenting Cells)
9th	1st	Cytokines – Types & Role in Immune Regulation
	2nd	Cell-Mediated Cytotoxicity: T cell
	3rd	Cell-Mediated Cytotoxicity: NK cell Lysis
10th	1st	Antibody-Dependent Cell-Mediated Cytotoxicity (ADCC)
	2nd	Hypersensitivity Reactions (Types I–IV)
	3rd	Hypersensitivity Reactions (Types I–IV)
11th	1st	Immunological Tolerance
	2nd	Autoimmunity – Introduction & Causes
	3rd	Autoimmunity – Introduction & Causes
12th	1st	Tumor Immunology – Immune Responses to Tumors

	2nd	Tumor Immunology – Immune Responses to Tumors
	3rd	Types of Tumor Antigens
13th	1st	Vaccine Design – Clinical Considerations
	2nd	Types of Vaccines – Traditional & Recombinant
	3rd	Hybridoma Technology
14th	1st	Monoclonal Antibodies: Production & Uses
	2nd	ELISA – Principle & Procedure
	3rd	ELISpot and Immunofluorescence Techniques
15th	1st	Flow Cytometry: Principle & Applications
	2nd	Immunohistochemistry – Use in Diagnostics
	3rd	Western Blotting – Introduction (Optional Additional Topic)
16th	1st	Immunological Techniques
	2nd	Disorders of the Immune System – Autoimmunity, Hypersensitivity
	3rd	Immunodeficiencies – Causes and Types
17th	1st	Therapeutic Interventions and Immunotherapy
	2nd	Diagnostics Using Immunotechnology