DEPARTMENT OF Molecular Biology & Biotechnology
LESSION Plan
Session 2023-24
SEMESTER – VI

Name of Teacher: Ms. Upasana Das

Paper Allotted: MLBGDSE03T : Recombinant DNA Technology and Fundamentals of Immunology (Theory)

Month	Paper	Topic	No. of classes
March 2024 (02.03.2024)	MLBGDSE03T	**Unit 3: Immunology:** **Immune response – An overview, Primary and secondary immune response,** **Cells and molecules involved in innate and adaptive immunity (Stem cell, T-cell, B-Cell, NK cell, Macrophage, Neutrophil, Eosinophil, Basophil, Mast cell and Dendritic cell).**	8
April 2024	MLBGDSE03T	**Antigens, antigenicity and immunogenicity, Epitope, Immunoglobulin or antibodies (basic ideas), Monoclonal and polyclonal antibody, Humoral and cell-mediated immunity,**	8
May 2024	MLBGDSE03T	**Antigen-antibody reaction (basic ideas), detection by agglutination, precipitation, ELISA, MHC molecules, Vaccination, hypersensitivity and autoimmunity (basic concept).**	5
		Internal Examination	2
June 2024		**Class for Slow Learners**	2
		END SEMESTER EXAMINATION	
Total Classes			25

Name of Teacher: Dr. Indrani Datta

Paper Allotted: MLBGDSE03T : Recombinant DNA Technology and Fundamentals of Immunology (Theory) & MLBGDSE03P : Recombinant DNA Technology and Fundamentals of Immunology (Practical)

Month	Paper	Topic	No. of classes
March 2024 (02.03.2024)	MLBGDSE03T	**Unit 1: Introduction to Molecular Cloning:** **Vectors: Characteristics of cloning vectors, Plasmids (pSC101, pBR322, pUC18/I9), Bacteriophage lambda insertion and replacement vectors, M13 based vectors, Cosmids, YACs and Ti plasmid. Shuttle vectors and Expression vectors: *E. coli lac* and T7 promoter-based**	12

		vectors. **Enzymes used in Molecular Cloning: Restriction enzymes. Types I, II and III, nomenclature, use of Type II restriction enzymes in cloning, Isoschizomers and Neoschizomers, Restriction Mapping, Restriction Fragment Length Polymorphism (RFLP).**	
	MLBGDSE03P	**Isolation of plasmid DNA.** **Agarose Gel Electrophoresis of plasmid DNA.**	**16**
April 2024	**MLBGDSE03T**	**DNA ligases, Terminal deoxynucleotidyl transferase, Polynucleotide Kinase, Phosphatases and Reverse Transcriptase.** **Cloning strategies: Construction of recombinant DNA: Joining of cohesive ends and blunt ends, c-DNA synthesis and cloning. Transformation of *E. coli* host by Calcium chloride method and electroporation.**	**12**
	MLBGDSE03P	**Preparation of competent cells for transformation by calcium chloride method.** **Transformation of *E. coli* host cell with plasmid DNA.**	**16**
May 2024	**MLBGDSE03T**	**Methods used in Molecular Cloning: Agarose gel electrophoresis of DNA, Southern, Northern and Western blotting.** **Unit 2: PCR Techniques:** **Principle of Polymerase Chain Reaction,** **RT-PCR, Real-Time PCR and their applications.**	**09**
	MLBGDSE03P	**Digestion of plasmid DNA using restriction enzymes and analysis by agarose gel electrophoresis.** **Detection of blood group**	**12**
		Internal Examination	**2**
June 2024		**Class for Slow Learners**	**2**
		END SEMESTER EXAMINATION	
Total Classes			**81**