Reference Books/ links :

S.No.	Name of Books/Authors/Publisher
1.	"Kuby Immunology" by Judy Owen; Jenni Punt; and Sharon Stranford (2018) Publisher: W.H. Freeman & Company
2.	"Janeway's Immunobiology" by Kenneth Murphy; Casey Weaver; and Allan Mowat (2016) Publisher: Garland Science
3.	Basic Immunology by A.K. Abbas and A.H. Lichtman. Third edition. Publisher: Saunders W.B. Company ;2010
4.	How the Immune System Works" by Lauren M. Sompayrac (2019) Publisher: Wiley-Blackwell
5.	"Cancer Immunotherapy"Immune Suppression and Tumor Growth 2nd Edition - June 4; 2013 Editors: George C. Prendergast; Elizabeth M. Jaffee Publisher: Academic Press
6.	Microbial Crosstalk with Immune System by Asmita Das (2022) Academic Press

Details of course: - Genetic Engineering (Department core course-11)

Course Title	Course Structure			Pre-Requisite
	L	T	P	
Genetic Engineering (BT 303)	3	0	2	Nil

Course Objective: Basic understanding of genetic engineering tools, gene manipulation, gene delivery rDNA Technology, Library construction and industrial application of gene cloning.

Course Outcome:	
I.	Understanding of basic principle of gene cloning and vectors used for cloning in different type of cells.
II.	Knowledge of various tools and enzymes deployed for manipulation and modification of DNA.
III.	Comparison of various methods deployed for gene delivery in host and identifying recombinant cells.
IV.	Learning of skills for construction of DNA libraries and utilization of expression system.

V.	Appraisal of industrial applications of gene cloning and understanding of various challenges and ethical issues.

S. No.	Content	Contact Hours
Unit 1	**Gene cloning vectors:** Isolation and purification of DNA, vectors for gene cloning: Plasmids, bacteriophages, cloning vectors for eukaryotes, cloning vectors for higher plants, cloning vectors for animals.	**8**
Unit 2	**DNA manipulation**: DNA manipulative and modifying Enzymes, mechanism of action, Restriction Endonucleases, restriction mapping and map construction, DNA methylase, Ligation.	**8**
Unit 3	**Gene Delivery and Identification of Recombinant Clones:** Methods for introduction of DNA into living cells: Transformation, Recombinants identification methods; An overview of PCR and variations; Selection & screening of recombinants clones and Reporter gene expression, RNA interference and site directed mutagenesis.	**9**
Unit 4	**Library Construction and Expression System**: Genomic and cDNA library construction; Studying gene expression, regulation and function; various expression system used in prokaryotes and eukaryotes; Methods for identification of translation product.	**9**
Unit 5	**Application of Gene cloning:** Production of recombinant proteins, Scale-up operations of recombinant cells, Pharming, Gene Therapy, Ethical issues and concerns.	**8**
	Total	42

List of Experiments

S.NO.	**TITLE**
Experiment 1	To prepare LB media.
Experiment 2	Sterilization and pouring of LB media.
Experiment 3	To perform streaking of E. coli on LB media plates.