LS 501A Molecular Genetics and Genetic Engineering 2 Credits

Name of the Faculty:
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Sr.No.	Topic	Faculty Name/ Contact Hours
1	Path from Genetics to Molecular Genetics and Genetic Engineering to Genomics	PCR/1
2	Transcriptional Control Regions of Prokaryotic and Eukaryotic Genes	PCR/4
4	DNA Modifying Enzymes, DNA Cloning and Manipulating Cloned DNA	PCR/3
5	RNA isolation, cDNA Synthesis, cDNA Library Construction and its Applications	PCR/1
6	Genomic DNA Library Construction and its Applications	PKV/3
7	Identification and analysis of recombinant DNA clones	PKV/2
8	RNA Interference, Gene Silencing, Epigenetics	KN/1
9	Milestones in Genome Sequencing; DNA labelling chemistry; Maxam-Gilbert Sequencing; Sanger sequencing	KN/2
10	Sanger Sequencing- dideoxy cycle seq and automated DNA seq; Templates for sequencing	KN/1
11	Genome sequencing techniques- classical, NGS	KN/2
12	Methods to study Gene Expression and its Applications	KN/2
13	Polymerase Chain Reaction and its Applications	KN/1
14	RNA-Seq chemistry and applications for transcriptomics	KN/1
15	Protein-Protein Interactions and its applications	KN/1
16	Fundamentals of Mass Spectrometry for proteomics	KN/2
17	Site-directed Mutagenesis, Genome Editing (Crispr-Cas, Zfn, Talen etc.) and their Applications	SD/3
18	Gene Knock-out and Knock-down Methods and their Applications	SD/1
19	Transgenic Systems and their Applications	SD/1

Further Reading:

1. Principles of gene manipulation and Genomics. 7th Edn. Primrose and Twyman (2006)
2. Molecular Biology of the Gene. Watson et al. 6th Edn (2009)
3. Genes IX. Lewin (2008)
4. Molecular Cloning- A laboratory Manual. Sambrook and Russell (2001)