

Molecular Genetics and Genetic Engineering (LS 501) (2 credits)
M. Sc. IIIrd Semester (Monsoon)

1	From Genetics to Molecular Genetics and Genetic Engineering	PCR
2	Transcriptional Control Regions of Prokaryotic and Eukaryotic Genes	PCR
3		”
4		”
5		”
6		DNA Modifying Enzymes, DNA Cloning and Manipulating Cloned DNA
7		”
8	RNA isolation, cDNA Synthesis, cDNA Library Construction and its Applications	”
9		PCR
	Quiz I	
10	Genomic DNA Library Construction and its Applications	PCR
11		”
12		”
13	Identification and Analysis of Recombinant DNA Clones	PCR
14		”
15	Mid-Semester Examinations	
16	RNA Interference, Gene Silencing, Epigenetics	KN
17		”
18	Overview of Genome Sequencing and DNA Sequencing Technology	KN
19	Milestones in Genome Sequencing and Maxam-Gilbert Sequencing; DNA labeling chemistries	KN
20	Sanger Sequencing- dideoxy, cycle seq and automated DNA seq; Templates for sequencing	KN
22	Genome sequencing techniques- classical	KN
23	Next Gen sequencing technology and its applications	”
24		KN
25	Methods to study Gene Expression and its Applications	”
26	RNA-Seq- chemistry and applications	”
27	Protein-Protein Interactions and its Applications	KN
28		”
29		KN
30	Fundamentals of Mass Spectrometry for proteomics	”
31	Site-directed Mutagenesis, Genome Editing (CRISPR-Cas, Zfn, Talen etc.) and their Applications	PCR
32		”
33		PCR
34	Gene Knock-out and Knock-down Methods and their Applications	”
35	Transgenic Systems and their Applications	”
	End-Semester Examinations	

KN: Prof. K. Natarajan*, PCR: Prof. P.C. Rath. * Coordinator

Books recommended: Principles of Gene Manipulation, S.B. Primrose, R.M. Twyman & R.W. Old (6th Edn.) Blackwell Science; Principles of Gene Manipulation & Genomics, S.B. Primrose & R.M. Twyman (7th Edn.) Blackwell Publishing and other literature