

Unit 3	Trees: Basic Terminology, Binary Trees and their representation, binary search trees, various operations on Binary search trees like traversing, searching, Insertion and Deletion, Applications of Binary search Trees, Complete Binary trees, Extended binary trees. General trees, AVL trees, Threaded trees, B- trees.	8
Unit 4	Sorting: Insertion Sort, Quick sort, Merge sort, Heap sort, sorting on different keys, External sorting. File Structure: File Organization, Indexing & Hashing, Hashing Functions, Collision Resolution Techniques	9
Unit 5	Graphs: Terminology and Representations, Graphs & Multi-graphs, Directed Graphs, Representation of graphs and their Transversal, Spanning trees, shortest path and Transitive Closure, Activity Networks, Topological Sort and Critical Paths.	6
Total		42

Books:-

1.	Ellis Horowitz and Sartaz Sahni. Fundamentals of Data structures. Galgotia Publications, New Delhi (1984).
2.	Tanenbaum, "Data Structures using C and C++", PHI (1997)
3.	Data Structures through C by Yashavant Kanetkar, Bpb publications (2008)
4.	J. Tremblay and P.G. Sorensen. "An Introduction to Data Structures and Application", McGraw Hill College Division (1998)
5.	Data Structures and Algorithms by A.V. Aho, J.E. Hopcroft and J. Ullman. Publisher: Addison-Wesley Publishing (1983)

Details of course:-

Course Title	Course Structure			Pre-Requisite
	L	T	P	
Molecular Biology (BT 202)	3	0	2	Knowledge of structure of nucleic acids and proteins

Course Objective: To give a detailed perspective of the Central Dogma of Molecular Biology and some basic molecular biology techniques

Course Outcome (CO):

- 1 To know the molecular mechanism of DNA replication in both prokaryotes and eukaryotes
- 2 To learn basic mechanism of transcription and various post-transcriptional processing events for pre-mRNA, pre-rRNA, pre-tRNA
- 3 To gain knowledge about gene expression, the structure of ribosomes, mRNA, tRNA, rRNA, and soluble factors involved in translation
- 4 To gain insight into the strategies for gene silencing and their application for genetic engineering purposes

- 5 To appraise various genetic manipulation, DNA sequencing, DNA amplification, and Nucleic acid analysis techniques

S.No.	Content	Contact Hours
Unit 1	DNA replication: Prokaryotic and eukaryotic DNA replication; Mechanism of DNA replication; Telomeres	8
Unit 2	Transcription and Post transcriptional processing of RNA: Transcription in prokaryotes and eukaryotes; Transcription factors; RNA polymerase; Regulatory elements; Post transcriptional processing of precursor mRNA, rRNA and tRNA	8
Unit 3	Translation and Post translational modifications: Genetic code; mRNA transport; Prokaryotic and eukaryotic translation; Post translational modifications of proteins	9
Unit 4	Regulation of gene expression: Concept of operon; Transcriptional and post-transcriptional gene silencing; Ubiquitination; Application of antisense RNA, RNAi, ribozyme	9
Unit 5	Techniques in Molecular Biology: DNA sequencing; Basics of PCR; Basics of DNA cloning; Southern and Northern hybridization	8
Total		42

Books:-

S.No.	Name of Books/ Author/Publisher
1.	Molecular Biology of the Gene by JD Watson et al. Publisher: Pearson
2.	Biochemistry by D Voet, JG Voet. Publisher: Wiley
3.	Lewin's Gene XII by JE Krebs, ES Goldstein, ST Kilpatrick. Publisher: Jones & Bartlett Learning
4.	Genomes 4 by TA Brown. Publisher: Garland Science
5.	Essential Molecular Biology (Practical Approach Series) by Brown. Publisher: OUP