CS108	Data Structures and Algorithms	L	T	P
		4	0	2

Defining a Data Structure: Notion of DFA triplet, Types of Data Structures.

Linear Structures: Array, List, Stack, Queue, Applications of arrays, lists, stacks and queues.

Non-Linear Data Structures: Tree, Tree Traversals, Binary Tree, Applications of Trees, Binary Search Tree, Graph, Shortest Path, Spanning Tree, Hashing and Collision Resolution Techniques.

Introduction to Algorithm Analysis and Design: Time Complexity Analysis**,** Asymptotic Notations, Introduction to Design Techniques such as Greedy, Divide and Conquer, Dynamic Programming, Backtracking, Branch and Bound.

Searching and Sorting: Linear Search, Binary Search, Bubble Sort, Selection Sort, Insertion Sort and Quick Sort.

Suggested Readings:

1. E. Horowitz, S. Sahani, S. Anderson-Freed, Fundamentals of Data Structures in C, Universities Press.
2. Standish, Data Structure, Addison-Wesley.
3. A. M. Tennenbaum, Y. Langsam and M. J. Augenstein, Data Structures using C, PHI.
4. D. E. Knuth, The Art of Computer Programming (Volume I), Pearson.
5. N. Wirth, Algorithms+Data Structures= Program, Prentice Hall.
6. T. H. Cormen et al., Introduction to Algorithms, PHI.

CS109	Data Communication	L	T	P
		3	1	0

Introduction: Data Communications- Components, Data Representation, Data flow, Networks, Network Types, Internet History, Protocol and Standards. Networks Models: Protocol Layering, TCP/IP Protocol suite, The OSI model, Addressing.

Physical Layer: Data and Signals, Analog Signals, Digital Signals, Transmission Impairment, Data Rate limits, Performance. Digital Transmission: Digital to digital conversion, Analog to digital conversion, Transmission Modes. Analog Transmission: Digital to Analog conversion, Analog to analog conversion. Bandwidth Utilization: Multiplexing. Transmission Media: Guided media, Unguided media. Switching: Circuit Switched network, Datagram Network, Virtual Circuit Network.

Data Link Layer: Error Detection and Correction: Introduction, Block coding, Linear block codes, Cyclic codes, Checksum, Forward error correction. Data link control- Framing, Flow