1. **Computer Fundamentals**
   1.1 Computers, Kinds of Computers in respect of size and function,
   1.2 Generation of Computers,
   1.3 Components and Architecture of Computers, Connecting the Components,.
   1.4 **Getting started:** Orientation to personal computers, The system unit, Starting the computers
   1.5 **Input Devices:** The keyboard, The mouse, Other input devices
   1.6 **Processing:** CPU, Memory
   1.7 **Storages devices:** Overview of Storage Devices, The Floppy Disk Drive, The Hard Drive, The Universal Serial Bus(USB) Devices and Other Storage Devices
   1.8 **Output devices:** Monitors, Printers, Modems, Soundboards
   1.9 **Dos survival guide:** Using Command Prompt, Creating and using AUTOEXEC.BAT and CONFIG.SYS
   1.10 **Windows survival guide**: The Windows Desktop, The Program Manager, Organizing the Desktop, The File Manager
   1.11 **Application software:** Using Application Software
   1.12 Windows Explorer, E-mails, Internet, Intranet, Extranets, Ethernet, HTTP
   1.13 Computer Viruses, Antivirus

2. **Data Structure and Algorithms**
   2.1 Fundamental of Data Structures, Abstract Data types,
   2.2 Lists, Linked Lists, Stacks,
   2.3 Queues, Priority Queue,
   2.4 **Trees:** Traversal, Implementations, Binary Trees, Binary Search Trees, Balanced Search Trees, AVL Trees.
   2.5 Indexing Methods. Hashing Trees, Suffix Trees
   2.6 Worst-Case and Expected time Complexity.
   2.7 Analysis of Simple Recursive and Nonrecursive Algorithms.
   2.8 Searching, Merging and Sorting.
   2.9 **Introductory Notions of algorithm design:** Divide-and-Conquer, Dynamic Programming, Greedy Methods, Backtracking
   2.10 **Graph algorithms:** Depth-first Search and Breadth-first Search, Shortest Path Problems, Minimum Spanning Trees, Directed Acyclic Graphs.

3. **System Analysis and Design**
   3.1 Defining the System, System Owner, System User, System Designers and system Builders, System Analysts, Variations on the System Analyst title, System life Cycle,
   3.2 **Joint Application Development (JAD):** JAD definition, JAD purpose, JAD Philosophy, JAD Scope,
   3.3 **Involved in a JAD:** Sponsor, Business Users, System Analyst
   3.4 **Roles of JAD Group Member:** Project Leader, Record Keeper, Time Keeper.
   3.5 **The System Design Environment:** Development Process, Management Process, System Structure, Basic Component of Computer based Information System, Personal/ Centralized/Distribution System.
   3.6 **Concept formations:** Introduction, Finding the Problem, Evaluating the Proposal, Technical Feasibility, Operational Feasibility, Economic Feasibility.
   3.7 **Requirements analysis:** Representing System Analysis Model, Requirement Model, Design Model,
   3.8 **Development Process:** Design Method.
   3.9 **Entity Relationship Diagram (E-R Diagram):** Notations, Entities: Strong Entities, Weak Entities, Attributes: Simple and Composite, Single Valued and Multiple Valued, Null and Derived Attribute.
   3.10 **Relationship Sets:** Degree of Relationship and Cardinality Relationship, Specialization, Generalization, Aggregation.