

Structured Programming in C

Control Constructs: Conditionals, Loops, and Jumps, Tuples, Unions, and Lists, Functions and Variables, Recursion, Memory Allocation model, Dynamic Memory Allocation – Pointers and Address Arithmetic, Dynamically Allocated Data and Linked Lists.

Reference books:

Brian W. Kernighan & Dennis M. Ritchie – The C Programming Language, Prentice Hall, Inc., 1988.

Advanced Programming in C

User Defined Types, Access Restricted Lists (Stacks/Queues). Binary Trees, Macros and Preprocessing, Modular Programming – Separate Compilation and linking. Libraries, File and I/O operations, String Processing.

Reference books:

Brian W. Kernighan & Dennis M. Ritchie – The C Programming Language, Prentice Hall, Inc., 1988.

Object Orientation and Software Engineering

Basics of OOP – Objects and Classes, and Delegation, Inheritance and Dynamic Binding. Types and Polymorphism. Templates/Generics. Software Lifecycle, Development Methodologies, Software Requirements Analysis and Modeling, Object Oriented Design, Design Patterns. Architectural Design, Modeling for Design. Software Testing and Quality.

Reference books:

Herbert Schildt., Java: The Complete Reference, Ninth Edition, 2014. Oracle Press.

Database Systems

Database Modeling & Design – ER modeling, Normalization Techniques, Database Querying – SQL.

Reference books

Database System Concepts. Silberschatz, Korth and Sudarshan. 6th Ed. McGraw Hill, 2016.

Core Systems

Number Representations and Boolean algebra, Logic Gates, Combinational and Sequential Circuits, Computer Organization: Instruction Set. Computer Arithmetic, Control and Memory Organization, Operating Systems – Basics, Processes and Threads, Operating systems – Memory Hierarchy, Virtual Memory, Secondary Storage, File Systems, Local Area Networks and Ethernet, Internetworking: TCP/UDP and IP, World Wide Web: Client – Server Systems, HTTP, HTML, XML, Web-based Systems.

Reference books

R. E. Bryant and David O' Hallaron, "Computer. Systems: A Programmer's Perspective," 2nd edition, Prentice-Hall, 2011.