

Data Structures

This course covers the design, analysis, and implementation of basic data structures in C++, the algorithms operating on the data structures, and performance measurement. Topics include: Review of Arrays and Abstract Data Type. Complexity of an algorithm: Big O notation, Complexity classes: constant, logarithmic, linear, quadratic, and exponential. Static data structures: Arrays, Simple Search Algorithms: Sequential and Binary search algorithms of arrays, Simple Sorting Algorithms: Bubble, selection, and insertion sort. Stacks and Queues implementation with array, Dynamically allocated storage, Pointers, Linked lists. Stacks and Queues implementation as linked list. Priority queues, Hashing, Trees, Binary trees, Search trees. Graphs. Hash tables, avoiding and resolving collisions. Binary search trees. Common operations on binary search trees such as select min, max, insert, delete, iterate over tree.