ORT Braude College
Department of Electrical and Electronic Engineering

31632 Data Structures and Algorithms

Lecturer: Dr. Samy Zafrany
Credits: 3.0
Hours: 2 lecture, 2 laboratory
Grade Composition: 30% - Project, 70% - final exam
Prerequisites: 31616

Course Description

Implementation and analysis of elementary data structures: arrays, lists, stacks, queues, maps, hash tables, sets, linked lists, heaps, graphs and trees. Implementation and analysis of elementary algorithms: searching, sorting, parsing, binary search, greedy algorithms, recursion, divide and conquer, DFS, BFS, graph traversal, backtracking, dynamical programming, probabilistic methods. Complexity analysis of fundamental algorithms: big O notation, linear, logarithmic, polynomial, and exponential complexity classes. P vs. NP problems. Advanced data structures: hyper graphs, VLSI networks, schematics, and layout modeling. Advanced algorithms: simulated annealing, genetic algorithms, parallel and distributed algorithms.

Bibliography

1. *Cormen T.H. et al*, Introduction to Algorithm. The MIT press 2001/9, 2nd/3rd ed
2. *Michael T. Goodrich, Roberto Tamassia, Michael H. Goldwasser*, Data Structures and Algorithms in Python. Wiley 2013
3. *Rance D. Necaise*. Data Structures and Algorithms Using Python. Wiley, 2011

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