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CT177H - Data Structures

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Objectives

- Understand the models of abstract data types implemented by data structures and evaluate the performance of these data structures
- Apply data structures and basic sorting algorithms to real world problems
 - Model problems using appropriate data structures
 - Write codes to solve practical problems using suitable data structures
- Have a background to use standard libraries in different programming languages
- Be conscious of roles of the data structures in solving realworld problems.

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Prerequisites

- CT054H - Introduction to Programming

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Course structure

Chapter	Content
Chapter 1	Some data structures of the C programming language
Chapter 2	Overview of Data structure (Abstract data types; Complexity and complexity calculation)
Chapter 3	Common abstract data types (List; Stack; Queue)
Chapter 4	Basic sort and search (Sort and Search)
Chapter 5	Binary search tree (The model of binary search tree; Binary search tree algorithms)
Chapter 6	AVL tree (Concepts and algorithms on AVL trees; Set)

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References

- Cormen, Thomas, Charles Leiserson, Ronald Rivest, and Clifford Stein. Introduction to Algorithms. 3rd ed. MIT Press, 2009. ISBN: 9780262033848
- Adam Drozdek, Data structures and Algorithms Analysis in C++ 4th Edition, Cengage Learning, 2012
- Gayle Laakmann McDowell, Cracking the coding interview. 6th ed. CareerCup, 2016
- Narasimha Karumanchi, Data Structures And Algorithms Made Easy, CareerMonk Publications, 2017

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Teaching methods

- Lecture, computer lab, exercises, discussion

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Duties of student

Students have to do the following duties:

- Attend at least 80% of theory classes.
- Participate 100% of practice hours and report results.
- Attend mid-semester test.
- Attend the final exam.
- Perform actively self-study hours.

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Assessment

- Midterm: 30%
- Final:
 - Practical exam: 50%
 - Theory exam: 20%

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