Chapter 0
Course Outline

Data Structures and Algorithms

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Acknowledgement

The lecture notes of this course are inspired from the lecture notes of Professor Dr. Cao Hoang Tru.

Overview

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Learning outcome

- Be able to use fundamental data structures like list, stack, queue, tree, graph, and hash table for programming and particular problems
- Express algorithms using pseudocode as well as using C++
- Analyze the computational complexity of algorithms associated with these data structures.

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Contents at a glance

1. Introduction
2. Complexity of algorithms
3. Recursion
4. List: Array-List, Linked List
5. Stack, Queue
6. Tree: Binary
7. AVL, B-Tree
8. Heap
9. Hash
10. Sorting
11. Graph

→ Final Exam

Structure

- Lectures: course contents in class
- Readings: course contents at home
- Tutorials: QAs and exercises
- Lab: coding practice
- Assignments: small projects

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Distribution

- **Course credit: 4**

- Lectures: 45 period units
- Exercises: 15 period units
- Lab: 15 period units
- Total: 75 period units

- Teaching from August 2015 to November 2015
- Final exam: in December 2015

Assessment

- Exercises: 15%
- Lab: 10%
- Assignments: 25%
- Final Exam: QAs and Writing, 50%

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References

1. **"Data Structures and Algorithm Analysis"** - Clifford A. Shaffer (Edition 3.2).

2. "Data Structures: a Pseudocode Approach with C++", R.F.Gilberg and B.A. Forouzan, Thomson Learning Inc., 2001.

3. "Data Structures and Algorithms in C++", A. Drozdek, Thomson Learning Inc., 2005.

4. "C/C++: How to Program", 7th Ed. – Paul Deitel and Harvey Deitel, Prentice Hall, 2012.

5. Internet.

Website

- Sakai portal
  - Link: `http://www.cse.hcmut.edu.vn/elearning/`
  - Course: **503001 CTDL&GT CSE 13 Fall 2015**

- Any question:
  - Luong The Nhan
  - Email: `nhanlt@cse.hcmut.edu.vn`

Preparation for the course

- Materials:
  - Slides of this course
  - E-book: **Data Structures and Algorithm Analysis** - Clifford A. Shaffer (Edition 3.2). `http://people.cs.vt.edu/~shaffer/Book/`

- Tools:
  - CodeBlocks (Cross-platform)
  - Visual C++ Express (Windows)
  - XCode (Mac OS)

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Methodology

- Outside of lecture room
  - Read slides, books
  - Check SAKAI & make discussions
  - Take exercises
  - Implement examples
- During lectures:
  - Listen & Discuss

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