

61FIT2DSA

Data structures and Algorithms

Spring 2025

Module Description

Contact Details

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Module Overview

1. Module Details

Faculty	Information Technology
Module code	61FIT2DSA
Module name	Data Structures and Algorithms
Level	Undergraduate
Units of credit	Three (3)
Prerequisite	61FIT2PR1
Suggested study	5 hours per week
Year	Spring 2025

2. Nature of the module

The goal of this module is to introduce the essential concepts and issues in Data structures and algorithms. Topics include algorithm analysis, searching/sorting algorithms and fundamental data structures such as stack, queue, tree and graph. The module aims to gear these ideas towards specific significant applications using Java programming language.

3. Learning objectives

On the completion of this module students should be able to:

- 3.1. Understand fundamental knowledge of algorithm complexity.
- 3.2. Gain general knowledge about some types of data structures and their operations.
- 3.3. Implement some basic algorithms such as sorting, searching or graph algorithms using Java programming language.
- 3.4. Have teamwork, self-study and programming skills using Java.
- 3.5. Develop self-motivation and time management skills.

Learning Resources

We recommend you to read the following books:

Textbook:

[1] Mark Allen Weiss, Data structures and algorithm analysis in Java, 3rd edition, Pearson, 2012.

Supplement book:

[2] Thomas H, Cormen, et al, Introduction to Algorithms, 3rd Edition, MIT Press, 2009

Course website:

[\[61FIT2DSA\]\[IT\] Data structures and Algorithms](#)

Assessments

1. Assessment table is applied to all students

Type	Assessment Name	Weight	Brief Description	Linked learning objectives
Internal	Attendance	0%	Students are expected to attend all classes. Students must participate in at least 80% of classes. Students who are requesting an excused absence are expected to show certified evidences.	
	Homework and Discussion	10%	List of problems will be released before tutorial class. Students have to show their answers or solutions. They have to be active, and answer all questions during tutorials.	3.1, 3.2, 3.3, 3.4
	Midterm	30%	Closed-book exam.	3.1, 3.2, 3.3, 3.4
Final		60%	Closed-book exam.	3.1, 3.2, 3.3, 3.4

2. Determination of final grade

Your internal mark, final exam and final grade are rounded to integers out of 10. The calculation uses the weightings in the assessment table above. You are not qualified to take the final exam (both first and second) if you participate less than 80% of classes.

Your grade is determined from your mark according to Hanoi University scale

- Less than 5: Fail
- 5: Pass
- 6 to 7: Good
- 8 to 10: Excellent

3. Pass Criteria

To obtain a grade of pass or higher in this module student must score 5 or more for the overall grade.

Proposed Weekly Lecture & Tutorial Schedule

Week	Lecture	Tutorial	Preparation
1	Introduction	Java review	Chapter 1 [1]; 1.1 & 1.2 [2]
2	Analysis of algorithms	Implement algorithm analysis	Ref: Chapter 2 [1]; 1.3 & 1.4 [2]
3	Sorting part I	Implement sorting algorithms part I	Chapter 7 [1]; 2.6 - 2.8 [2]
4	Sorting part II	Implement sorting algorithms part II	Chapter 7 [1]; 2.6 - 2.8 [2]
5	List	Implement list operations	Chapter 3.1-3.5 [1]; 3.10 [2]
6	Stack and Queue	Implement stack, queue operations	Chapter 3.6-3.7 [1]; 3.10 [2]
7	Review for Midterm	Midterm	
8	Stack and Queue application	Implement Stack Queue application	Chapter 3.6-3.7 [1]; 3.10 [2]
9	Tree part I	Implement tree operations part I	Chapter 4 [1]; 3.12 [2]
10	Tree part II	Implement tree operations part II	Chapter 4 [1]; 3.12 [2]
11	Graph part I	Implement graph operations part I	Chapter 9 [1]; 6.22 & 6.23 [2]
12	Graph part II	Implement graph operations part II	Chapter 9 [1]; 6.22 & 6.23 [2]

Academic Honesty and Misconduct

Hanoi University expects all students and staff to act with honesty and integrity with all matters.