CS2468: DATA STRUCTURES AND DATA MANAGEMENT

Effective Term
Semester A 2024/25

Part I Course Overview

Course Title
Data Structures and Data Management

Subject Code
CS - Computer Science
Course Number
2468

Academic Unit
Computer Science (CS)

College/School
College of Computing (CC)

Course Duration
One Semester

Credit Units
3

Level
B1, B2, B3, B4 - Bachelor's Degree

Medium of Instruction
English

Medium of Assessment
English

Prerequisites
CS2360 Java Programmingor equivalent

Precursors
Nil

Equivalent Courses
Nil

Exclusive Courses
Nil

Part II Course Details

Abstract

Data structures are essential in computer science. This course aims to let the student describe concepts and techniques of fundamental data structures, data management and simple file systems.

Course Intended Learning Outcomes (CILOs)

	CILOs	Weighting (if app.)	DEC-A1	DEC-A2	DEC-A3
1	Describe the functionality of a data structure as an abstract data type.			x	
2	Implement an abstract data type in a programming language.			x	
3	Implement and test data structures for common structures; select an appropriate data structure from a given set of structures to solve a given problem.			x	
4	Develop the attitude to propose solutions through independent investigation.		x	x	
5	Develop the ability to design, implement, and apply data structures and data storage management to simple real life problems.		x	x	

A1: Attitude
Develop an attitude of discovery/innovation/creativity, as demonstrated by students possessing a strong sense of curiosity, asking questions actively, challenging assumptions or engaging in inquiry together with teachers.

A2: Ability
Develop the ability/skill needed to discover/innovate/create, as demonstrated by students possessing critical thinking skills to assess ideas, acquiring research skills, synthesizing knowledge across disciplines or applying academic knowledge to real-life problems.

A3: Accomplishments
Demonstrate accomplishment of discovery/innovation/creativity through producing /constructing creative works/new artefacts, effective solutions to real-life problems or new processes.

Learning and Teaching Activities (LTAs)

	LTAs	Brief Description	CILO No.	Hours/week (if applicable)
1	Lecture	Students will engage in lectures that explain concepts, different kind of data structures, algorithms for data structures	1, 2, 3, 4, 5	3 hours per week
2	Tutorials	Students will do exercises about concepts, data structure algorithms and programming	1, 2, 3, 4, 5	8 hours per semester
3	Pre-mid-term	The students have to give narrative-type answers or write simple functions in a programming language to test their understanding of fundamental concepts.	1, 2, 3, 4, 5	1 hour per semester

4	Midterm	Students will be tested on all the contents we have learnt so far.	1, 2, 3, 4, 5	2 hour per semester
5	Assignments	The students have to finish two or three assignments through individual investigation. The first assignment is to apply the learnt data structures for problems, and the second is to let the student combine several data structures to solve problems.	1, 2, 3, 4, 5	

Assessment Tasks / Activities (ATs)

	ATs	CILO No.	Weighting (%)	Remarks (e.g. Parameter for GenAI use)
1	Assignments	1, 2, 3, 4, 5	8	2 assignments will be given.
2	Exercises (in-lecture and in-tutorial)	1, 2, 3, 4, 5	10	10 in-lectures exercises will be given in 10 weeks. 10 in-tutorial exercises will be given in 10 weeks .
3	Pre-mid-term test	1, 2, 3, 4, 5	4	
4	Midterm	1, 2, 3, 4, 5	8	

Continuous Assessment (%)

30

Examination (%)

70

Examination Duration (Hours)

2

Additional Information for ATs

For a student to pass the course, at least 30% of the maximum mark for the examination must be obtained.

Assessment Rubrics (AR)

Assessment Task

Exercises (in-lecture and in-tutorial)

Criterion

Perfect answers full mark. 50% for in-perfect answers.

Assessment Task

Assignments

Criterion

Question has a score

Excellent (A+, A, A-)
High

Good (B+, B, B-)
Significant

Fair (C+, C, C-)
Moderate

Marginal (D)
Basic

Failure (F)
Not even reaching marginal levels

Assessment Task
Pre-mid-term test

Criterion
Question has a score

Excellent (A+, A, A-)
High

Good (B+, B, B-)
Significant

Fair (C+, C, C-)
Moderate

Marginal (D)
Basic

Failure (F)
Not even reaching marginal levels

Assessment Task
Midterm

Criterion
Question has a score

Excellent (A+, A, A-)
High

Good (B+, B, B-)
Significant

Fair (C+, C, C-)
Moderate

Marginal (D)
Basic

Failure (F)
Not even reaching marginal levels

Assessment Task
Final exam

Criterion
Question has a score

Excellent (A+, A, A-)
High

Good (B+, B, B-)
Significant

Fair (C+, C, C-)
Moderate

Marginal (D)
Basic

Failure (F)
Not even reaching marginal levels

Part III Other Information

Keyword Syllabus
Abstract data types, data structures, linked lists, stacks, queues, binary trees, multiway trees, sorting, searching, file processing, and updating files.

Reading List

Compulsory Readings

	Title
1	Michael T. Goodrich and Roberto Tamassia. Data Structure and Algorithms in Java. John Wiley & Sons, Inc. 5th edition.

Additional Readings

	Title
1	Cormen, Thomas H., Charles E. Leiserson, Ronald L. Rivest, and Clifford Stein. Introduction to Algorithms. Cambridge, MA: MIT Press, 3rd edition.