

**City University of Hong Kong
Course Syllabus**

**offered by Department of Computer Science
with effect from Semester A 2017/18**

Part I Course Overview

Course Title: Data Structures and Data Management

Course Code: CS2468

Course Duration: One semester

Credit Units: 3 credits

Level: B2

Arts and Humanities

Proposed Area:
(for GE courses only)

Study of Societies, Social and Business Organisations

Science and Technology

Medium of Instruction: English

Medium of Assessment: English

Prerequisites: CS2360 Java Programming
(Course Code and Title) or equivalent

Precursors: Nil
(Course Code and Title)

Equivalent Courses: Nil
(Course Code and Title)

Exclusive Courses: Nil
(Course Code and Title)

Part II Course Details

1. Abstract

(A 150-word description about the course)

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

2. Course Intended Learning Outcomes (CILOs)

(CILOs state what the student is expected to be able to do at the end of the course according to a given standard of performance.)

No.	CILOs [#]	Weighting* (if applicable)	Discovery-enriched curriculum related learning outcomes (please tick where appropriate)		
			A1	A2	A3
1.	Describe the functionality of a data structure as an abstract data type.			✓	
2.	Implement an abstract data type in a programming language.			✓	
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.			✓	
4.	Develop the attitude to propose solutions through independent investigation.		✓	✓	
5.	Develop the ability to design, implement, and apply data structures and data storage management to simple real life problems.		✓	✓	
		100%			

* If weighting is assigned to CILOs, they should add up to 100%.

[#] Please specify the alignment of CILOs to the Gateway Education Programme Intended Learning outcomes (PILOs) in Section A of Annex.

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 self-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.

3. Teaching and Learning Activities (TLAs)

(TLAs designed to facilitate students' achievement of the CILOs.)

Teaching pattern:

Suggested lecture/tutorial/laboratory mix: 2 hrs. lecture; 1 hr. tutorial

TLA	Brief Description	CILO No.					Hours/week (if applicable)
		1	2	3	4	5	
Lecture	Explain concepts, different kind of data structures, algorithms for data structures	✓	✓	✓	✓	✓	
Tutorials	Do exercises about concepts, data structure algorithms and programming	✓	✓	✓	✓	✓	
Quiz	In the quiz, the students have to give narrative-type answers or write simple functions in a programming language to test their understanding of fundamental concepts.	✓	✓	✓	✓	✓	
Midterm	We will test all the contents we have learnt so far.	✓	✓	✓	✓	✓	
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.	✓	✓	✓	✓	✓	

4. Assessment Tasks/Activities (ATs)

(ATs are designed to assess how well the students achieve the CILOs.)

Assessment Tasks/Activities	CILO No.					Weighting*	Remarks
	1	2	3	4	5		
Continuous Assessment: <u>30%</u>							
Assignments	✓	✓	✓	✓	✓	15%	
Quiz	✓	✓	✓	✓	✓	6%	
Midterm	✓	✓	✓	✓	✓	9%	
Final Examination [^] : <u>70%</u> (duration: 2 hours)							
						100%	

* The weightings should add up to 100%.

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

5. Assessment Rubrics

(Grading of student achievements is based on student performance in assessment tasks/activities with the following rubrics.)

Assessment Task	Criterion	Excellent (A+, A, A-)	Good (B+, B, B-)	Fair (C+, C, C-)	Marginal (D)	Failure (F)
1. Assignments	Question has a score	High	Significant	Moderate	Basic	Not even reaching marginal levels
2. Quiz	Question has a score	High	Significant	Moderate	Basic	Not even reaching marginal levels
3. Midterm	Question has a score	High	Significant	Moderate	Basic	Not even reaching marginal levels
4. Final exam	Question has a score	High	Significant	Moderate	Basic	Not even reaching marginal levels

Part III Other Information (more details can be provided separately in the teaching plan)

1. Keyword Syllabus

(An indication of the key topics of the course.)

Abstract data types, data structures, linked lists, stacks, queues, binary trees, multiway trees, Btrees, sorting, searching, file processing, physical characteristics of data storage devices, access and retrieval times, updating files.

2. Reading List

2.1 Compulsory Readings

(Compulsory readings can include books, book chapters, or journal/magazine articles. There are also collections of e-books, e-journals available from the CityU Library.)

1.	Michael T. Goodrich and Roberto Tamassia. <i>Data Structure and Algorithms in Java</i> . John Wiley & Sons, Inc. 5 th edition.
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2.2 Additional Readings

(Additional references for students to learn to expand their knowledge about the subject.)

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