Unit Outline

COMP1002 Data Structures and Algorithms

Semester 2, 2016

Unit study package code:	COMP1002
Mode of study:	Internal
Tuition pattern summary:	Note: For any specific variations to this tuition pattern and for precise information refer to the Learning Activities section. Lecture: 1 x 2 Hours Weekly Tutorial: 1 x 2 Hours Weekly This unit does not have a fieldwork component.
Credit Value:	25.0
Pre-requisite units:	1920 (v.0) Object Oriented Program Design 110 or any previous version *OR* COMP1001 (v.0) Object Oriented Program Design or any previous version
Co-requisite units:	Nil
Anti-requisite units:	Nil
Result type:	Grade/Mark
Approved incidental fees:	Information about approved incidental fees can be obtained from our website. Visit fees.curtin.edu.au/incidental_fees.cfm for details.
Unit coordinator:	**Title:** Dr **Name:** Hannes Herrmann **Phone:** +618 9266 3309 **Email:** Hannes.Herrmann@curtin.edu.au **Location:** Building: 314 - Room: 343
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Learning Management System:	Blackboard (lms.curtin.edu.au)

Acknowledgement of Country

We respectfully acknowledge the Indigenous Elders, custodians, their descendants and kin of this land past and present.

Syllabus

Introduction to fundamental data structures, algorithms and techniques in computing. Basic structures include stacks, queues and linked lists. Advanced structures explored are trees, hash tables and heaps. Algorithms discussed include sorting and recursion. Complexity analysis of these areas is also examined.

Introduction

This unit introduces students to fundamental algorithms and data structures used in almost any computer program. Java is used as the language of implementation, but most of the unit is aimed at general computing structures and algorithms rather than being Java-specific.

Unit Learning Outcomes

All graduates of Curtin University achieve a set of nine graduate attributes during their course of study. These tell an employer that, through your studies, you have acquired discipline knowledge and a range of other skills and attributes which employers say would be useful in a professional setting. Each unit in your course addresses the graduate attributes through a clearly identified set of learning outcomes. They form a vital part in the process referred to as assurance of learning. The learning outcomes tell you what you are expected to know, understand or be able to do in order to be successful in this unit. Each assessment for this unit is carefully designed to test your achievement of one or more of the unit learning outcomes. On successfully completing all of the assessments you will have achieved all of these learning outcomes.

Your course has been designed so that on graduating we can say you will have achieved all of Curtin's Graduate Attributes through the assurance of learning process in each unit.

	On successful completion of this unit students can:	Graduate Attributes addressed
1	Identify and compare performance and implementation differences between various data structures and algorithms in program design	
2	Analyse the implementation and testing of sorting algorithms and data structures	
3	Design and construct a small application in the Java programming language that makes use of appropriate data structures and file I/O	
4	Apply an object-oriented approach to program design and implementation in the Java programming language	
5	Assess the use of, and consequences for, different algorithms in the context of internationalised software development	

Curtin's Graduate Attributes

	Apply discipline knowledge		Thinking skills (use analytical skills to solve problems)		Information skills (confidence to investigate new ideas)
	Communication skills		Technology skills		Learning how to learn (apply principles learnt to new situations) (confidence to tackle unfamiliar problems)
	International perspective (value the perspectives of others)		Cultural understanding (value the perspectives of others)		Professional Skills (work independently and as a team) (plan own work)

Find out more about Curtin's Graduate attributes at the Office of Teaching & Learning website: ctl.curtin.edu.au

Learning Activities

The lectures provide the theoretical foundations for achieving the unit learning outcomes. The practical worksheet exercises further develop on the lectures to give students hands-on experience of the underlying theories. Students should ensure that they stay current with the practical exercises since falling behing will likely prevent the successful completion of th unit.

Learning Resources

Library Reserve

There are resources for this unit in the library Reserve collection. To access these resources, please click on the following link:

http://link.library.curtin.edu.au/primo/course?COMP1002

Recommended texts

You do not have to purchase the following textbooks but you may like to refer to them.

- LaFore, R. (2002) Data Structures and Algorithms in Java 2nd ed., Waite Group Press.
  (ISBN/ISSN: 075-2063324530)
- Weiss, M. (2010) Data Structures & Problem Solving Using Java, 4th ed., Pearson.
  (ISBN/ISSN: 978-0321541406)

Assessment

Assessment schedule

	Task	Value %	Date Due	Unit Learning Outcome(s) Assessed
1	Practicals	10 percent	**Week:** Weekly **Day:** Scheduled practical session **Time:** During the session	2,3,4
2	Mid-Semester Test	20 percent	**Week:** Week 7 **Day:** During the lecture **Time:** During the lecture	1,2,4
3	Assignment	20 percent	**Week:** Week 13 **Day:** Tuesday **Time:** 12 noon	1,2,3,4
4	Final Examination	50 percent	**Week:** Examination Period **Day:** TBA **Time:** TBA	1,2,4,5

Detailed information on assessment tasks

1. Practical worksheet exercises will be assessed in your next scheduled practical session. This means that you need to be available for the entire session, or at least until you have been assessed. They must be submitted by 12 noon on the Tuesday of the appropriate week. See the calendar at the back of this outline for the weeks that each practical submission is due.

   If you submit late (even by one minute) you will get zero marks, so ensure that you submit early. If you are not at the practical session when your name is called you will also receive zero marks for that practical, so please be punctual.
2. The mid-semester test will be held during the lecture of Week 7. NO MAKEUP (LATE / MISSED) MIDTEST WILL BE GIVEN. To pass the mid-semester test, you need to read the lecture notes AND review the practical sessions. You need to approximately 5 hours reading around the subject covered in each lecture. In addition, you also need to spend some extra hours revising for the test. The test will be handed back within three weeks of sitting the test.
3. Refer to the assignment specification

4. The examination will cover all aspects of the unit.

Pass requirements

In order to pass the unit a student must:

- score at least 50% overall, and
- score at least 45% in the final exam, and
- have made a reasonable attempt at the assignment. Note that the assignment specifications give details of what is considered a reasonable attempt.

Fair assessment through moderation

Moderation describes a quality assurance process to ensure that assessments are appropriate to the learning outcomes, and that student work is evaluated consistently by assessors. Minimum standards for the moderation of assessment are described in the Assessment and Student Progression Manual, available from policies.curtin.edu.au/policies/teachingandlearning.cfm

Late assessment policy

This ensures that the requirements for submission of assignments and other work to be assessed are fair, transparent, equitable, and that penalties are consistently applied.

1. All assessments students are required to submit will have a due date and time specified on this Unit Outline.
2. Students will be penalised by a deduction of ten percent per calendar day for a late assessment submission (eg a mark equivalent to 10% of the total allocated for the assessment will be deducted from the marked value for every day that the assessment is late). This means that an assessment worth 20 marks will have two marks deducted per calendar day late. Hence if it was handed in three calendar days late and given a mark of 16/20, the student would receive 10/20. An assessment **more than seven calendar days overdue will not be marked and will receive a mark of 0.**

Assessment extension

A student unable to complete an assessment task by/on the original published date/time (eg examinations, tests) or due date/time (eg assignments) must apply for an assessment extension using the Assessment Extension form (available from the Forms page at students.curtin.edu.au/administration/) as prescribed by the Academic Registrar. It is the responsibility of the student to demonstrate and provide evidence for exceptional circumstances beyond the student's control that prevent them from completing/submitting the assessment task.

The student will be expected to lodge the form and supporting documentation with the unit coordinator before the assessment date/time or due date/time. An application may be accepted up to five working days after the date or due date of the assessment task where the student is able to provide an acceptable explanation as to why he or she was not able to submit the application prior to the assessment date. An application for an assessment extension will not be accepted after the date of the Board of Examiners' meeting.

Late assessments are not available for the weekly submissions. However extensions are available, with appropriate documentation and evidence.

Late assessments and extensions are not offered for the mid-semester test. Instead, a student found to have a valid reason for not attending that test will be exempted from it. This will mean that the marks normally allocated to the mid-semester test will instead be allocated for the final exam for this student.

Late assessment is accepted for the assignment, although you will lose marks as stated above. Extensions are available with the appropriate documentation and evidence.

Deferred assessments

If your results show that you have been granted a deferred assessment you should immediately check OASIS for details.

Deferred examinations/tests will be held from 15/02/2017 to 17/02/2017 . Notification to students will be made after the Board of Examiners' meeting via the Official Communications Channel (OCC) in OASIS.

Supplementary assessments

Supplementary assessments, if granted by the Board of Examiners, will have a due date or be held between 15/02/2017 and 17/02/2017 . Notification to students will be made after the Board of Examiners' meeting via the Official Communications Channel (OCC) in OASIS.

It is the responsibility of students to be available to complete the requirements of a supplementary assessment. If your results show that you have been granted a supplementary assessment you should immediately check OASIS for details.

Reasonable adjustments for students with disabilities/health circumstances likely to impact on studies

A Curtin Access Plan (CAP) is a document that outlines the type and level of support required by a student with a disability or health condition to have equitable access to their studies at Curtin. This support can include alternative exam or test arrangements, study materials in accessible formats, access to Curtin's facilities and services or other support as discussed with an advisor from Disability Services (disability.curtin.edu.au). Documentation is required from your treating Health Professional to confirm your health circumstances.

If you think you may be eligible for a CAP, please contact Disability Services. If you already have a CAP please provide it to the Unit Coordinator at the beginning of each semester.

Referencing style

The referencing style for this unit is Chicago.

More information can be found on this style from the Library web site:
http://libguides.library.curtin.edu.au/referencing.

Copyright

Academic Integrity (including plagiarism and cheating)

Any conduct by a student that is dishonest or unfair in connection with any academic work is considered to be academic misconduct. Plagiarism and cheating are serious offences that will be investigated and may result in penalties such as reduced or zero grades, annulled units or even termination from the course.

Plagiarism occurs when work or property of another person is presented as one's own, without appropriate acknowledgement or referencing. Submitting work which has been produced by someone else (e.g. allowing or contracting another person to do the work for which you claim authorship) is also plagiarism. Submitted work is subjected to a plagiarism detection process, which may include the use of text matching systems or interviews with students to determine authorship.

Cheating includes (but is not limited to) asking or paying someone to complete an assessment task for you or any use of unauthorised materials or assistance during an examination or test.

From Semester 1, 2016, all incoming coursework students are required to complete Curtin's Academic Integrity Program (AIP). If a student does not pass the program by the end of their first study period of enrolment at Curtin, their marks will be withheld until they pass. More information about the AIP can be found at: https://academicintegrity.curtin.edu.au/students/AIP.cfm

Refer to the Academic Integrity tab in Blackboard or academicintegrity.curtin.edu.au for more information, including student guidelines for avoiding plagiarism.

Information and Communications Technology (ICT) Expectations

Curtin students are expected to have reliable internet access in order to connect to OASIS email and learning systems such as Blackboard and Library Services.

You may also require a computer or mobile device for preparing and submitting your work.

All worksheet submissions must work on the Department of Computing lab machines in the lab in which you are enrolled. The student is responsible for ensuring this compatability if working on alternate computing devices.

For general ICT assistance, in the first instance please contact OASIS Student Support: oasisapps.curtin.edu.au/help/general/support.cfm

For specific assistance with any of the items listed below, please contact The Learning Centre: life.curtin.edu.au/learning-support/learning_centre.htm

- Using Blackboard, the I Drive and Back-Up files
- Introduction to PowerPoint, Word and Excel

Additional information

Enrolment

It is your responsibility to ensure that your enrolment is correct - you can check your enrolment through the eStudent option on OASIS, where you can also print an Enrolment Advice.

Student Rights and Responsibilities

It is the responsibility of every student to be aware of all relevant legislation, policies and procedures relating to their rights and responsibilities as a student. These include:

- the Student Charter
- the University's Guiding Ethical Principles
- the University's policy and statements on plagiarism and academic integrity
- copyright principles and responsibilities
- the University's policies on appropriate use of software and computer facilities

Information on all these things is available through the University's "Student Rights and Responsibilities" website at: students.curtin.edu.au/rights.

Student Equity

There are a number of factors that might disadvantage some students from participating in their studies or assessments to the best of their ability, under standard conditions. These factors may include a disability or medical condition (e.g. mental illness, chronic illness, physical or sensory disability, learning disability), significant family responsibilities, pregnancy, religious practices, living in a remote location or another reason. If you believe you may be unfairly disadvantaged on these or other grounds please contact Student Equity at eesj@curtin.edu.au or go to http://eesj.curtin.edu.au/student_equity/index.cfm for more information

You can also contact Counselling and Disability services: http://www.disability.curtin.edu.au or the Multi-faith services: http://life.curtin.edu.au/health-and-wellbeing/about_multifaith_services.htm for further information.

It is important to note that the staff of the university may not be able to meet your needs if they are not informed of your individual circumstances so please get in touch with the appropriate service if you require assistance. For general wellbeing concerns or advice please contact Curtin's Student Wellbeing Advisory Service at: http://life.curtin.edu.au/health-and-wellbeing/student_wellbeing_service.htm

Recent unit changes

Students are encouraged to provide unit feedback through ***e*VALUate**, Curtin's online student feedback system. For more information about ***e*VALUate**, please refer to evaluate.curtin.edu.au/info/.

	To view previous student feedback about this unit, search for the Unit Summary Report at https://evaluate.curtin.edu.au/student/unit_search.cfm. See https://evaluate.curtin.edu.au/info/dates.cfm to find out when you can ***e*VALUate** this unit.

Recent changes to this unit include:

More comprehensive coverage of some topics, and the order of topics taught has changed.

Program calendar

Program Calendar – Semester 2 2016

Week	Begin Date	Lecture	Pre-readings	Tutorial/Other	Assessment Due
Orientation	**25 July**	Orientation Week			
1.	**1 August**	O-O Concepts		Basic Network Classes (Practicals 0 and 1)	None
2.	**8 August**	File I/O		File I/O	Prac 1
3.	**15 August**	Recursion		Towers	Prac 2
4.	**22 August**	Arrays, stacks, queues		Stack, queue	Prac 3
5.	**29 August**	Tuition Free Week			
6.	**5 September**	Hash tables		Hash tables	Prac 4
7.	**12 September**	**Mid - semester test**		Sorting	Prac 5 **Mid - Sem test**
8.	**19 September**	Sorting		Quicksort	Prac 6
9.	**26 September**	Tuition Free Week			
10.	**3 October**	Lists, iterators, generics		Linked list and iterator	Prac 7
11.	**10 October**	Trees		Trees	Prac 8
12.	**17 October**	Heaps		Heaps	Prac 9
13.	**24 October**	Advanced trees		Assignment	Prac 10 Assignment
14.	**31 October**	Catch-up and revision		Feedback	**None**
15.	**7 November**	Study Week			
16.	**14 November**	Examinations			
17	**21 November**	Examinations			