Unit Outline

COMP1002 Data Structures and Algorithms

Semester 2, 2020

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 *OR* COMP1005 (v.0) Fundamentals of Programming or any previous version *OR* COMP1000 (v.0) Unix and C Programming or any previous version *OR* 10163 (v.0) Unix and C Programming 120 or any previous version *OR* COMP1007 (v.0) Programming Design and Implementation 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:** Valerie Maxville **Phone:** 9266 7428 **Email:** V.Maxville@curtin.edu.au **Location:** Building: 314 - Room: 338
Teaching Staff:	**Name:** Dr Valerie Maxville **Phone:** 9266 7428 **Email:** V.Maxville@curtin.edu.au **Location:** Building: 314 - Room: 338
Administrative contact:	**Name:** Michelle Cutinha **Phone:** 9266 7428 **Email:** m.cutinha@curtin.edu.au

Location: Building: 314 - Room: 340

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. The Centre for Aboriginal Studies aspires to contribute to positive social change for Indigenous Australians through higher education and research.

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. The unit covers general computing structures and algorithms rather than being language-specific. Students will implement their code in Java and/or Python.

Unit Learning Outcomes

All graduates of Curtin University achieve a set of six Graduate Capabilities during their course of study. These inform an employer that, through your studies, you have acquired discipline knowledge and a range of other skills and capabilities which employers would value in a professional setting. Each unit in your course addresses the Graduate Capabilities 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 notify you of 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 knowledge 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 you will have achieved all of Curtin's Graduate Capabilities through the assurance of learning processes in each unit.

	On successful completion of this unit students can:	Graduate Capabilities 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 Capabilities

	Apply discipline knowledge, principles and concepts		Innovative, creative and entrepreneurial		Effective communicators with digital competency
	Globally engaged and responsive		Culturally competent to engage respectfully with local First Peoples and other diverse cultures		Industry connected and career capable
Find out more about Curtin's Graduate Capabilities at the Curtin Learning and Teaching website: clt.curtin.edu.au					

Learning Activities

The lectures provide the theoretical foundations for achieving the unit learning outcomes. The practical worksheet exercises further develop concepts from the lectures to give students hands-on experience of the underlying theories. The practicals are critical for building understanding of the unit and are key for doing well on the assignment and exam. Students should ensure that they stay current with the practical exercises since falling behind will make it very difficult to be successful in the unit

Learning Resources

Library Reading List

The Reading List for this unit can be accessed through Blackboard.

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: 2063324530)
- Weiss, M. (2010) Data Structures & Problem Solving Using Java, 4th ed., Pearson.
  (ISBN/ISSN: 0321541406)

Assessment

Assessment policy exemptions

- There are no exemptions to the assessment policy

Assessment schedule

	Task	Value %	Date Due	Unit Learning Outcome(s) Assessed	Late Assessments Accepted?*	Assessment Extensions Considered?*
1	Practicals	20%	**Week:** Weekly **Day:** Scheduled practical session **Time:** During the practical session	2,3,4	No	Yes
2	Assignment	30%	**Week:** Week 12 **Day:** Friday 23rd October **Time:** 4:00pm (WST)	1,2,3,4	Yes	Yes
3	Final Examination	50%	**Week:** Examination Period **Day:** TBA **Time:** TBA	1,2,4,5	No	Yes

*Please refer to the Late Assessment and the Assessment Extension sections below for specific details and conditions.

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 the start of your next practical.** See the calendar at the back of this outline for the weeks that each practical submission is due.
   If you submit late you may get zero marks, so ensure that you submit early. If you are not at the practical session when your name is called you may also receive zero marks for that practical, so please be punctual.
2. Refer to the assignment specification.
3. The final assessment 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 assessment, and
- have made a reasonable attempt at the assignment. Note that the assignment specification gives details of what is considered a reasonable attempt.

Assessment Moderation

Fair assessment through moderation

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

Pre-marking moderation

This unit complies with moderation of assessments as described in the Assessment and Student Progression Manual, available from policies.curtin.edu.au/findapolicy/

Intra-marking / Post-marking moderation

This unit complies with moderation of assessments as described in the Assessment and Student Progression Manual, available from policies.curtin.edu.au/findapolicy/

Late assessment

Where the submission of a late assessment is permitted, late penalties will be consistently applied in this unit.

Where a late assessment **is** permitted for an assessment item or the entirety of the unit (refer to the Assessment Schedule table in this Unit Outline) and the student does not have an approved assessment extension:

1. For assessment items submitted within the first 24 hours after the due date/time, students will be penalised by a deduction of 5% of the total marks allocated for the assessment task;
2. For each additional 24 hour period commenced an additional penalty of 10% of the total marks allocated for the assessment item will be deducted; and
3. Assessment items submitted more than 168 hours late (7 calendar days) will receive a mark of zero.

Where late assessment **is NOT** permitted for an assessment item or the entirety of the unit (refer to the Assessment Schedule table in this Unit Outline) and the student does not have an approved assessment extension:

1. All assessment items submitted after the due date/time will receive a mark of zero.

Assessment extension

Where an application for an assessment extension **is** permitted for an assessment item(s) within this unit (refer to the Assessment Schedule table in this Unit Outline):

1. A student who is unable to complete an assessment item by/on the due date/time as a result of exceptional circumstances beyond the student's control, may apply for an assessment extension on the Assessment Extension Application Form as prescribed by the Academic Registrar. The form is available on the Forms page at https://students.curtin.edu.au/essentials/forms-documents/forms/ and also within the student's OASIS (My Studies tab – Quick Forms) account.
2. The student will be expected to submit their application for an Assessment Extension with supporting documentation:
    a. Australian Campuses: via the online form
    b. Offshore campuses: to the School representative nominated below
3. Timely submission of this information supports the assessment process. For applications that are declined, delayed submission may have significant ramifications on the possible marks awarded.
4. An application may be accepted up to five working days after the due date/time of the assessment item where the student is able to provide a verifiable explanation as to why they were not able to submit the application prior to the assessment due date/time

Where an application for an assessment extension **is NOT** permitted for an assessment item(s) within this unit (refer to the Assessment Schedule table in this Unit Outline):

1. All assessment items submitted after the due date/time will be subject to late penalties or receive a mark of zero depending on the unit permitting late assessment submissions.

Late assessments are not available for the weekly submissions. However extensions are available, with appropriate documentation and evidence.
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 13/02/2021 to 19/02/2021 . Notification to students will be made after the Board of Examiners' meeting via the Official Communications Channel (OCC) in OASIS.

Further assessment

Further assessments, if granted by the Board of Examiners, will be held between 13/02/2021 and 19/02/2021 . Notification to students will be made after the Board of Examiners meeting via the Official Communications Channel in OASIS.

It is the responsibility of the student to be available to complete the requirements of a further assessment. If your results show that you have been granted a further 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. Carers for people with disability may also be eligible for support. 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 AccessAbility Services.

Documentation is required from your treating Health Professional to confirm your health circumstances or carer responsibilities.

If you think you may be eligible for a CAP, please contact AccessAbility Services. If you already have a CAP please provide it to the Unit Coordinator in week 1 of each study period.

Referencing style

The referencing style for this unit is Chicago 17th B.

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

Privacy

As part of a learning or assessment activity, or class participation, your image or voice may be recorded or transmitted by equipment and systems operated by Curtin University. Transmission may be to other venues on campus or to others both in Australia and overseas.

Your image or voice may also be recorded by students on personal equipment for individual or group study or assessment purposes. Such recordings may not be reproduced or uploaded to a publicly accessible web environment. If you wish to make such recordings for study purposes as a courtesy you should always seek the permission of those who are impacted by the recording.

Recording of classes or course materials may not be exchanged or distributed for commercial purposes, for compensation, or for any other purpose other than personal study for the enrolled students in the unit. Breach of this may subject a student to disciplinary action under Statute No 10 – Student Disciplinary Statute.

If you wish to discuss this please talk to your Unit Coordinator.

Copyright

Academic Integrity (including plagiarism and cheating)

Academic Integrity

Curtin's Student Charter, Academic Integrity Program (AIP), and core Values guide expectations regarding student behaviour and responsibilities. Information on these topics can be found on the Student Essentials Website or the Academic Integrity tab in Blackboard.

Academic Integrity Warnings

An Academic Integrity Warning may be issued to a New-to-Curtin student if they have inadequately acknowledged sources or collaborated inappropriately. The Management of Academic Integrity Warnings for New to Curtin Students Procedures provide further information and explain who is considered to be New-to-Curtin.

Academic Misconduct

Students with an academic breach that do not meet the New-to-Curtin criteria will be managed through the misconduct process. Academic Misconduct means conduct by a student that is dishonest or unfair in connection with any academic work. This includes all types of plagiarism, cheating, collusion, falsification or fabrication of data or other content, and Academic Misconduct Other, such as falsifying medical certificates for extension. More details can be found on the Student Essentials Website or on the Academic Integrity Website.

Staff members are required to report suspected misconduct and an inquiry may take place. If misconduct is determined it will result in penalties, which may include a warning, a reduced or nil grade, a requirement to repeat the assessment, an annulled grade (ANN) or termination from the course. Some penalties may impact on future enrolment.

Academic work under inquiry will not be graded until the process has concluded. If your work is the subject of an inquiry you will be notified by email and Official Communication with an opportunity to respond. Appropriate support will be provided. For more information refer to Statute No.10 Student Discipline and Academic Misconduct Rules.

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.

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
- Values and Signature Behaviours
- 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 of the above 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 caring 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 the appropriate service below. 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.

To discuss your needs in relation to:

- Disability or medical conditions, contact AccessAbility Services: https://students.curtin.edu.au/personal-support/disability/
- Elite athletes, contact Elite Athlete Coordinator: https://stadium.curtin.edu.au/sport/academy/elite-athlete-program/
- All other grounds, contact the Student Wellbeing Advisory Service: https://students.curtin.edu.au/personal-support/counselling-guidance/wellbeing/

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:

- Students may use Java and/or Python in this unit (Sem 2, 2017)
- Re-ordering of topics (Sem 2, 2019)
- Removal of mid-semester test from assessments to comply with Curtin Assessment Policy (Sem 1, 2020)
- Recursion in separate lecture (Sem 1, 2020)

Program calendar

Week	Begin Date (Mon)	Lecture	Practical	Assessment Due
0.	27 Jul	**Orientation Week**		
1.	3 Aug	Intro and Sorting	Prac 1: Sorting	-
2.	10 Aug	Recursion, Wrappers and Exceptions	Prac 2: Recursion	Prac 1
3.	17 Aug	Stacks and Queues (+Objects)	Prac 3: Stacks and Queues	Prac 2
4.	24 Aug	Linked Lists & Iterators (+Polymorphism)	Prac 4: Linked Lists & Iterators	Prac 3
5.	31 Aug	**Tuition Free Week**		
6.	7 Sep	Trees	Prac 5: Trees	Prac 4
7.	14 Sep	Graphs	Prac 6: Graphs	Prac 5
8.	21 Sep	Hash Tables	Prac 7: Hash Tables	-
9.	28 Sep	**Tuition Free Week**		
10.	5 Oct	Heaps	Prac 8: Heaps	Prac 6 & 7
11.	12 Oct	Advanced Sorting	Prac 9: Advanced Sorting	Prac 8
12.	19 Oct	Advanced Trees	Prac 10: Advanced Trees	Prac 9 **Assignment**
13.	26 Oct	DSA in Practice	Prac 11: DSA in Practice	Prac 10
14.	2 Nov	Catch-up and Revision	Feedback and Catch-up	Prac 11
15.	9 Nov	**Study Week**		
16.	16 Nov	**Examinations**		
17.	23 Nov	**Examinations**		

Schedule is subject to change - see Blackboard for Updates