



The University of Southern Queensland

Course specification

The current and official versions of the course specifications are available on the web at <http://www.usq.edu.au/coursespecification/current>.
Please consult the web for updates that may occur during the year.

Description: Algorithms and Data Structures

Subject	Cat-nbr	Class	Term	Mode	Units	Campus
CSC	2401	91527	2, 2009	ONC	1.00	Toowoomba

Academic group:	FOSCI
Academic org:	FOS003
Student contribution band:	2
ASCED code:	020111

STAFFING

Examiner: Michael de Raadt
Moderator: David Lai

REQUISITES

Pre-requisite: CSC1401 or USQIT16 or Students must be enrolled in one of the following Programs: MPIT or MSBN or MSMS

RATIONALE

Algorithms and Data Structures is one of the major courses in the Computer Science Curriculum recommended by ACM/IEEE-CS Joint Curriculum Task Force. It is essential for students to gain a good knowledge of algorithms and data structures in order to be competent computer programmers. It is closely related to other computing courses, and students will find that this course is essential for other subsequent courses such as Operating Systems and Software Engineering.

SYNOPSIS

This course addresses various data structures and techniques for algorithm design and analysis. It covers basic data structures such as lists, stacks, queues, trees and graphs within an Object paradigm. The design of various algorithms such as searching algorithms, sorting algorithms and graph algorithms is discussed. This course also addresses other topics such as recursive algorithms and complexity analysis.

OBJECTIVES

On completion of this course the student will have learned or achieved:

1. demonstrate an in-depth understanding of various data structures as abstract specifications (Assignments 1 to 3, Exam);
2. use alternative implementations of data structures (Exam);
3. properly apply algorithms and data structures in programs (Assignments 1 to 3, Exam);
4. analyse algorithms using various techniques (Exam);

- demonstrate skills in selecting and designing algorithms, data structures, and implementations (Exam).

TOPICS

	Description	Weighting (%)
1.	Overview of C++	20.00
2.	Data abstraction and separate compilation	10.00
3.	Algorithm analysis techniques	10.00
4.	Dynamic memory allocation and storage	10.00
5.	Lists, stacks, queues	10.00
6.	Trees	10.00
7.	Sets, Maps and Hashing	10.00
8.	Sorting	10.00
9.	Graphs	10.00

TEXT and MATERIALS required to be PURCHASED or ACCESSED

ALL textbooks and materials are available for purchase from USQ BOOKSHOP (unless otherwise stated). Orders may be placed via secure internet, free fax 1800642453, phone 07 46312742 (within Australia), or mail. Overseas students should fax +61 7 46311743, or phone +61 7 46312742. For costs, further details, and internet ordering, use the 'Textbook Search' facility at <http://bookshop.usq.edu.au> click 'Semester', then enter your 'Course Code' (no spaces).

Students must have access to a standard compliant C++ compiler.

Koffman, EB & Wolfgang, PAT 2006, *Objects, abstraction, data structures and design using C++*, John Wiley and Sons Inc, New Jersey, USA.

REFERENCE MATERIALS

Reference materials are materials that, if accessed by students, may improve their knowledge and understanding of the material in the course and enrich their learning experience.

STUDENT WORKLOAD REQUIREMENTS

ACTIVITY	HOURS
Examinations	2.00
Laboratory or Practical Classes	26.00
Lectures	26.00
Private Study	107.00

ASSESSMENT DETAILS

Description	Marks out of	Wtg (%)	Due date
QUIZZES	10.00	10.00	24 Jul 2009 (see note 1)
ASSIGNMENT 1	10.00	10.00	14 Aug 2009 (see note 2)
ASSIGNMENT 2	15.00	15.00	25 Sep 2009
ASSIGNMENT 3	15.00	15.00	23 Oct 2009
2HR RESTRICTED EXAMINATION	50.00	50.00	END S2 (see note 3)

NOTES

1. Quizzes are due to be completed by 11:59:59pm Australian Eastern Standard Time on Fridays at the end of each week.
2. Assignments 1 - 3 are due 11:59:59pm Australian Eastern Standard Time on each due date.
3. Examination dates will be available during the semester. Please refer to the examination timetable when published.

IMPORTANT ASSESSMENT INFORMATION

- 1 Attendance requirements:
It is the students' responsibility to attend and participate appropriately in all activities (such as lectures, tutorials, laboratories and practical work) scheduled for them, and to study all material provided to them or required to be accessed by them to maximise their chance of meeting the objectives of the course and to be informed of course-related activities and administration.
- 2 Requirements for students to complete each assessment item satisfactorily:
To satisfactorily complete an assessment item a student must achieve at least 50% of the marks for that assessment item. Students do not have to satisfactorily complete each assessment item to be awarded a passing grade in this course. Refer to Statement 4 below for the requirements to receive a passing grade in this course.
- 3 Penalties for late submission of required work:
If students submit assignments after the due date without (prior) approval of the examiner then a penalty of 5% of the total marks gained by the student for the assignment may apply for each working day late up to ten working days at which time a mark of zero may be recorded. No assignments will be accepted after model answers have been posted.
- 4 Requirements for student to be awarded a passing grade in the course:
To be assured of receiving a passing grade a student must achieve at least 50% of the total weighted marks available for the course.
- 5 Method used to combine assessment results to attain final grade:
The final grades for students will be assigned on the basis of the aggregate of the weighted marks obtained for each of the summative assessment items in the course.
- 6 Examination information:
Candidates are allowed access only to specific materials during a Restricted Examination. The only materials that candidates may use in the restricted examination for this course are: writing materials (non-electronic and free from material which could give the student

- an unfair advantage in the examination); Students may bring a single A4 sheet of hand-written notes (double sided). The sheet must not be a photocopy or printout.
- 7 Examination period when Deferred/Supplementary examinations will be held:
Any Deferred or Supplementary examinations for this course will be held during the next examination period.
 - 8 University Regulations:
Students should read USQ Regulations 5.1 Definitions, 5.6. Assessment, and 5.10 Academic Misconduct for further information and to avoid actions which might contravene University Regulations. These regulations can be found at the URL <http://www.usq.edu.au/corporateservices/calendar/part5.htm> or in the current USQ Handbook.

ASSESSMENT NOTES

- 9 The due date for an assignment is the date by which a student must despatch the assignment to the USQ. The onus is on the student to provide proof of the despatch date, if requested by the Examiner.
- 10 In accordance with University Policy, the Examiner may grant an extension of the due date of an assignment in extenuating circumstances.
- 11 All assignments should be submitted on line via the course web site.
- 12 The Faculty will NOT accept submission of assignments by facsimile or email.
- 13 Students who do not have regular access to the Internet or who are otherwise disadvantaged by these regulations may be given special consideration. They should contact the examiner of the course to negotiate such special arrangements.
- 14 Students who, for medical, family/personal, or employment-related reasons, are unable to complete an assignment or to sit for an examination at the scheduled time may apply to defer an assessment in a course. Such a request must be accompanied by appropriate supporting documentation. One of the following temporary grades may be awarded IDS (Incomplete - Deferred Examination; IDM (Incomplete Deferred Make-up); IDB (Incomplete - Both Deferred Examination and Deferred Make-up).
- 15 Students may be required to provide a copy of assignments submitted for assessment purposes. Such copies should be dispatched to the USQ within 24 hours of receipt of a request to do so.

OTHER REQUIREMENTS

- 1 Students will require access to e-mail and internet access to UConnect for this course.
 - 2 Assignment specifications are available on the course website.
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