SCSSE

School of Computer Science and Software Engineering
Faculty of Informatics

CSCI103 Algorithms and Problem Solving
Subject Outline
Spring Session 2009

Head of School –Professor Willy Susilo, Student Resource Centre, Tel: (02) 4221 3606

GENERAL INFORMATION

Subject Coordinator

	Dr Jo Abrantes
Telephone Number:	0242 21 3872
Email:	jo@uow.edu.au
Location:	3.212

Dr Abrantes's consultation times during session:

Day	Time
Tuesday	13.30-15.30
Friday	13.30-15.30

Subject Organisation

Session:	Spring Session, Wollongong Campus
Credit Points	6 credit points
Contact hours per week:	1x 1 hour lecture and 1x2 hour lecture + 1x 1 hour tutorial and 1x2 hour tutorial
Lecture Times & Location:	Lecture A Tues 9:30-11:30, 1.G05 Lecture B Thurs 9:30-10:30, 22.G22
Tutorial Day, Time and Location can be found at:	http://www.uow.edu.au/student/timetables/index.html

Students should check the subject's web site regularly as important information, including details of unavoidable changes in assessment requirements will be posted from time to time via e-Learning space http://www.uow.edu.au/student/. Any information posted to the web site is deemed to have been notified to all students.

Subject Description

CSCI103 introduces the basic concepts of algorithms and their relationship to data structures and problem solving. This subject emphasises problem solving techniques leading to the development of algorithms rather than their implementation or a formal mathematical treatment of algorithms. Topics include sorting, searching and counting problems and the principal algorithms used in their solution. Common approaches to algorithm development and analysis will be examined.

Subject Objectives

On successful completion of this subject, students should be able to:

1. Create algorithms for solving simple problems
2. Determine the appropriate solution technique for a given problem
3. Demonstrate an understanding of the concepts of time and space complexity as applied to simple algorithms

4. Discuss informally the computational efficiency of the principal algorithms for sorting and searching
5. Relate trees to data structures, algorithms and counting.

Graduate Qualities

This subject will continue to the following graduate qualities:
Informed
Problem Solvers

Further information can be found at:
http://www.uow.edu.au/informatics/scsse/current/SubjectInformation/UOW049401.html

Attendance Requirements:

It is the responsibility of students to attend all lectures/tutorials/labs/seminars/practical work for subjects for which you are enrolled. It should be noted that the amount of time spent on each 6 credit point subject should be at least 12 hours per week, which includes lectures/tutorials/labs etc.

Satisfactory attendance is deemed by the University, to be attendance at approximately 80% of the allocated contact hours.

Attendance rolls will be kept for lectures, tutorials**.** If you are present for less than 80% of the allocated contact hours and would have otherwise passed you need to apply for student academic consideration, otherwise a TF (technical fail) grade will be recorded.

Students MUST attend their **allocated** tutorial unless they have the written permission of the subject coordinator.

Method of Presentation:

In order to maximize learning outcomes, it is strongly recommended that students attend all lectures.

This subject comprises lectures and Tutorials. Tutorials will relate to the lecture topics. Lecture material will be available from the subject's e-Learning website (the Vista site). Students are free to print their own copies of these slides. However, as these slides will not necessarily include all of the examples and explanations given in lectures, attendance at lectures will be required. Students can greatly reduce the amount of note taking by printing the electronic copies of the material prior to the lectures and annotating as necessary.

Lecture Schedule:

A proposed Lecture schedule for the subject is as follows:

Week	Topic
1	Course information: algorithms and problem solving, what is it and why do we need it?
2	Introduction to algorithms and problem solving.
3	Pseudocode and Flowcharts
4	Elementary algorithms
5	Records, arrays, lists
6	Sorting and searching algorithms
7	Linked list
8	Queues and stacks
9	Recursion
10	Trees
11	Graphs
12	Algorithm analysis: empirical measurement, performance comparison
13	Algorithmic strategies: Brute force, greedy, divide and conquer
14	Algorithmic strategies: Backtracking, heuristics

Changes to the above schedule will be posted via e-Learning space http://www.uow.edu.au/student/.

Any information posted to the web site is deemed to have been notified to all students.

Subject Materials:

Any readings/references are recommended only and are not intended to be an exhaustive list. Students are encouraged to use the library catalogue and databases to locate additional readings

Textbook(s):

There is no prescribed textbook for this subject, however the books listed below are highly recommended.

Reference Books:

- *Simple Program Design: a step-by-step approach*, Lesley Anne Robertson, Nelson, 2006
- Foundations *of Computer Science From Data Manipulation to Theory of Computation*, B.A. Forouzan, 2003
- *Starting Out with Programming Logic & Design,* Tony Gaddis, Pearson, 2007
- *Introduction to Algorithms and Problem Solving* (for The University of Wollongong), Behrouz A. Forouzan, D.S. Malik and M. K. Sen, Thomson, 2005.
- *Algorithms-International Edition,* Richard Johnsonbaugh and Marcus Schaefer, Pearson/Prentice Hall, 2004
- Introduction to The Design and Analysis of Algorithms, Anany Levitin, Addison Wesley, 2002

Assessment:

This subject has the following assessment components.

ASSESSMENT ITEMS & FORMAT	% OF FINAL MARK	GROUP/ INDIVIDUAL	DUE DATE
Assignment 1	5%	Individual	Assignment 1: Monday 17.30 in week 4
Assignment 2	5%	Individual	Assignment 2: Monday 17.30 in week 7
Assignment 3	5%	Individual	Assignment 3: Monday 17.30 in week 9
Assignment 4: Midterm Reflection	5%	Individual	Week 10, at the start of Tuesday's Lecture
Assignment 5	5%	Individual	Assignment 4: Monday 17.30 in week 12
Midterm Test	20%	Individual	Week 7, during Tuesday's lecture time
Tutorial Journal	5%	Individual	Monday 17.30 weekly
Final Examination	50%	Individual	Exam Period

Notes on Assessment:

All assignments are expected to be completed independently. Plagiarism may result in a FAIL grade being recorded for that assignment.

Reflective Journals:

- The ***tutorial journal*** is an online record of a student's tutorial activities and a record of answers, etc. to the problems presented in tutorial sessions. Students should keep a record of what they are doing so that they can assess their progress throughout the semester. Tutorial journals will be marked on a satisfactory/unsatisfactory basis during the semester with a mark being declared for this assessment item out of 5 at the end of the semester (for more details see section: *Other procedures for the submission of assessment items*).

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- The ***Assignment Journal*** will be worth 1 mark within each assignment. This journal will summarise what the student has learnt during each assessment as well as any pitfalls and problems encountered by the student and how those problems were overcome. Further details of

what should be included in the journals will be provided during lectures and in the assignment specification (for more details see section: *Other procedures for the submission of assessment items*).

The ***Midterm Reflection*** will contain the student's reflection on the errors made in Midterm test. It will list the errors made in the test together with the reasons for the errors and the correct answers. (for more details see section: *Other procedures for the submission of assessment items*).

These journals are meant to help students move towards a reflective approach to learning.

Electronic Submission of Assessment Items:

Unless otherwise notified by the subject coordinator, all written assignments must be submitted electronically.

Submission of assessment items via email will not be accepted.

Other Procedures for the submission of assessment items:

(a) There will be 5 assignments, which will be assessed. Unless otherwise specified by the subject coordinator, assignments 1, 2, 3 and 5 must be submitted electronically by the due date.

- Assignments 1, 2, 3 and 5 MUST be accompanied with the ***Assignment Journal***.
- Assignment 4 (***Midterm Reflection***) must be submitted at the start of the Tuesday's lecture in week 10. The student must submit a printed copy of this assignment together with his/her Midterm exam and the School's assignment cover sheet.

(b) Specifications of all assignments will be released in electronic format ONLY. The students will be able to assess and printout the electronic specifications from the e-Learning website.

(c) Instructions for the electronic submission of each assignment will be given on the assignment's specification.

(d) As assignments are designed to assess a student's understanding of course material, each assignment must be solved using only material covered up to the point of submission in the course (unless otherwise stated in the assignment).

(e) The ***tutorial journal*** must be submitted electronically each week (from week 2 onwards) by the due date. Once submitted, tutorial journal entries cannot be edited.

(f) Students must check the e-Learning web site regularly for any eventual changes on assessment requirements and due dates and for updates on assessment marks. It is each student's responsibility to regularly check the subject's website.

(g) Assignments will be returned in the 2-hour tutorial. Enquiries about the marks can only be made to the tutors during the laboratory class time, within a maximum of 1 week after the assignment is handed back. After 1 week, no marks can be changed.

(h) Penalties may apply to all late work, except if Student Academic Consideration or an extension has been granted by your subject coordinator or lecturer.

(i) Late assignments will be marked but the mark awarded will be reduced by 25% for each day late. Assignments will not be accepted more than four days late.

(j) Under some circumstances, an assignment extension may be granted by the subject coordinator/lecturer. The subject coordinator/lecturer has the full right to deny/award the extension. Each student must apply for the extension through the SOLS system before the assignment due date. In many circumstances, students may be asked to produce documentation to support his/her case.

(k) A supplementary exam (for final examination) may be offered to a student who has applied for a supplementary exam through the SOLS system. The Subject Coordinator has the right to grant/reject the request. It is the student's responsibility to discuss this matter with the Subject Coordinator before the exam (unless completely impossible) to arrange whether the supplementary exam is possible.

(l) There is ***no* supplementary test available for mid term test**. The test will be conducted in **Tuesday's lecture time** in Week 7. The venue will be arranged and published via SOLS. You must ensure that you attend this test to avoid losing 20% of the total marks in this subject.

Procedures for the return of assessment items:

Evaluation of assignments will take no more than 2 weeks from submission date and the papers will be returned to students in their 2-hour tutorial.

Penalties for late submission of assessment items:

Penalties apply to all late work, except if student academic consideration has been granted. Late submissions will attract a penalty of 25% of the assessment mark.

Work more than four (4) days late will be awarded a mark of zero.

Tutorial/Lab Closure Policy

If for any reason, the number of students in a tutorial or lab falls below a sustainable enrolment level, as determined by the Head of School, tutorials/labs offered for that subject may be collapsed or deleted.
You will have to attend the new tutorials/lab if this closure affects the one you are attending.

We will endeavour to make this decision no later than Week 4 of session.

Supplementary Exams

Supplementary Exams will be dealt with in accordance with student academic consideration policy (http://www.uow.edu.au/about/policy/studentacademicconsiderationpolicy.pdf) 9.2 Timing of Supplementary Exams.

While the School normally grants supplementary exams when the student does not sit the standard exam for an acceptable reason, each case will be assessed on its own merit and there is no guarantee a supplementary exam will be granted. If a supplementary exam is granted, you will normally be notified via SOLS Mail the time and date of this supplementary exam. You must follow the instructions given in the email message.

Please note that if this is your last session and you are granted a supplementary exam, be aware that your results will not be processed in time to meet the graduation deadline.

Student Academic Consideration Policy

The School recognises that it has a responsibility to ensure equity and consistency across its subjects for all students. Sometimes, in exceptional circumstances, students need to apply for student academic consideration in order to complete all assessable work.

The University applies strict criteria to the granting of student academic consideration. Before applying for student academic consideration, students should carefully read the University's policy which can be found at: http://www.uow.edu.au/about/policy/studentacademicconsiderationpolicy.pdf.

Plagiarism

When you submit an assessment task, you are declaring the following

1. It is your own work and you did not collaborate with or copy from others.
2. You have read and understand your responsibilities under the University of Wollongong's policy on plagiarism.
3. You have not plagiarised from published work (including the internet). Where you have used the work from others, you have referenced it in the text and provided a reference list at the end ot the assignment.

Students must remember that:

Plagiarism will not be tolerated.

Students are responsible for submitting original work for asssessment, without plagiarising or cheating, abiding by the University's policies on Plargiarism as set out in the University

Handbook under University Policy Directory and in Faculty handbooks and subject guides. Plagiarism has led to the expulsion from the University.

Student Academic Grievance Policy

The School aims to provide a fair, equitable and productive learning environment for all its students. The Student Academic Grievance Policy seeks to support the achievement of this goal by providing a transparent and consistent process for resolving student academic grievances.

Any student who has a grievance over a result should obtain a Faculty of Informatics Appeal Against Decision or Action Affecting Academic Experience form from the Informatics Student Enquiry Centre. (http://www.uow.edu.au/content/groups/public/@web/@inf/@faculty/documents/doc/uow017433.pdf) The student should firstly take the form to the marker/lecturer to discuss the matter and, if the student is still not satisfied, s/he should take the next step as outlined on the form.

Once the grievance has been considered by the Faculty, if the student still feels the situation has not been fully resolved s/he may consult the Dean of Students. However, the Dean of Students can have no input into the academic judgment of the lecturer and can only review the grievance to ensure proper procedure has been followed.

Relevant University Policies, procedures and students services:

For more information students must refer to the Faculty handbook, online references or consult the UOW policy in full at http://www.uow.edu.au/handbook/courserules/studacgrievpol.html which contains a range of policies on educational issues and student matters.

This outline should be read in conjunction with the following documents:

Code of Practice - Teaching and Assessment http://www.uow.edu.au/handbook/codesofprac/teaching_code.pdf	Code of Practice - Students http://www.uow.edu.au/handbook/codesofprac/cop_students.html
Code of Practice-Honours http://www.uow.edu.au/handbook/CodeofPractice-Honours.pdf	Acknowledgement Practice **Plagiarism will not be tolerated:** http://www.uow.edu.au/handbook/courserules/plagiarism.html
Key Dates http://www.uow.edu.au/student/dates.html	Student Academic Consideration Policy: http://www.uow.edu.au/about/policy/studentacademicconsiderationpolicy.pdf
Course Progress Requirements: http://www.uow.edu.au/student/mrp/index.html	Graduate Qualities Policy: http://www.uow.edu.au/about/teaching/qualities/index.html#_The_new_UOW
Academic Grievance Policy (Coursework and honours students) http://www.uow.edu.au/handbook/courserules/studacgrievpol.html	Non-Discriminatory Language Practice and Presentation http://staff.uow.edu.au/eed/nondiscrimlanguage.html
Occupational Health and Safety http://staff.uow.edu.au/ohs/commitment/ohspolicy/index.html	Ownership of Work & Intellectual Property Policy: http://www.uow.edu.au/handbook/generalcourserules/UOW028651.html
Human Research Ethics Committee: http://www.uow.edu.au/research/rso/ethics/human/	Rules for student conduct: http://www.uow.edu.au/handbook/generalrules/StudentConductRules.pdf
Independent Learners' Introductory Program http://www.uow.edu.au/student/attributes/ilip/	Informatics Faculty Librarian, Ms Annette Meldrum, phone: 4221 4637, email: ameldrum@uow.edu.au
Student Support Services: http://www.uow.edu.au/student/services/ Informatics Faculty SEDLO **(Student Equity and Diversity Liaison Officers)** Virginie Schmelitschek, phone 4221 3833, virginie@uow.edu.au	SCSSE Internet Access & Student Resource Centre http://www.uow.edu.au/informatics/common/uow024466.html
SCSSE Computer Usage Rules http://www.uow.edu.au/informatics/common/uow024457.html	SCSSE Subject Outlines http://www.uow.edu.au/informatics/scsse/current