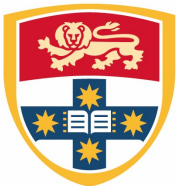

THE UNIVERSITY OF SYDNEY

School of
Information Technologies

Unit COMP5045

Computational Geometry

6 Credit Points

Unit of Study Outline & Assessment Details

Semester 1, 2010

IMPORTANT: Policy relating to Academic Dishonesty and Plagiarism.

The School of Information Technologies[1] views all forms of academic dishonesty, including plagiarism and recycling, very seriously.

Plagiarism means presenting another person's ideas, findings or work as one's own by copying or reproducing them without due acknowledgement of the source.

Recycling means the submission for assessment of one's own work, or of work which is substantially the same, which has previously been counted towards the satisfactory completion of another unit of study, and credited towards a university degree, and where the examiner has not been informed that the student has already received credit for that work.

Students who submit work containing significant portions that have been copied from other sources, including published works, the internet, existing programs, work previously submitted for other awards or assessments, or the work of other students, without proper acknowledgement will be penalised. Decisions as to the penalty may include:

(a) counselling the student;
(b) issuing a written warning;
(c) requiring the student to resubmit the work for assessment; or to undertake other remedial work;
(d) requiring the student to undertake another form of assessment in lieu of the assignment in question, such as an unseen examination;
(e) applying a fail grade to the work, or part thereof, submitted for assessment;
(f) applying a fail grade overall in the unit of study; or
(g) referring the matter to the Registrar if the head of school considers there has been a breach of the University's standards of academic honesty and the student continues in a denial, or, following the interview, the head of school considers that failing the unit of study is insufficient to deal with the matter.

Where there is doubt about which portions of work are contributed by a particular student he/she may be required to demonstrate knowledge of the relevant material by answering oral questions or by undertaking supplementary work, either written or in the laboratory, in order to arrive at the final assessment mark.

[1] Refer to Academic Board policy: http://www.usyd.edu.au/ab/policies/Academic_Honesty_Cwk.pdf

COMP5045 Computational Geometry

1. Introduction

In many areas of computer science - robotics, computer graphics, virtual reality, and geographic information systems are some examples - it is necessary to store, analyse, and create or manipulate spatial data. This course deals with the algorithmic aspects of these tasks. We study techniques and concepts needed for the design and analysis of geometric algorithms and data structures. Each technique and concept will be illustrated on the basis of a problem arising in one of the application areas mentioned above.

2. Objectives

This is an introductory course to computational geometry and its applications. Students will (are expected to) learn techniques needed in designing and analyzing efficient algorithms for problems in geometry, including convex hulls, geometric intersections, plane sweep algorithms, Voronoi diagrams, Delaunay triangulations and geometric data structures.

3. Entry Requirements

Knowledge of basic algorithm design techniques. Knowledge of basic analysis techniques such as asymptotic notation, solving summations and recurrences. Knowledge of basic data structures.

4. Unit of Study Delivery

A variety of learning situations will be employed during the unit of study, including lectures, recommended reading and assessed assignments. To benefit fully from this unit it is necessary to participate fully in all aspects of the unit of study.

5. Expectations

Example of text to insert here:

1. Students are expected to attend all scheduled lectures. You should expect to spend a minimum of 12 hours per week including scheduled lectures on your course.
2. Students are expected to undertake recommended reading and to submit selected work for assessment as directed. It should be realised that some assessments are expected to take longer than the time for a lecture.
3. Students are expected to be able to work independently and to make effective use of a range of resources including the lectures, recommended book, the library and relevant on-line help facilities.

6. Assessment Package

The unit of study will be assessed by means of the following components:

Component	*% of Final Grade*
Assignment 1	25.00%
Assignment 2	25.00%
Assignment 3	25.00%
Exam	25.00%

It is a policy of the School of Information Technologies that in order to pass this unit, a student must achieve at least 40% in the written examination as well as in the other components of assessment together. A student must also achieve an overall final mark of 50 or more. Any student not meeting these requirements can achieve a maximum mark of no more than 45.

Late work: In the interests of fairness to all students, the School of Information Technologies policy states that late work cannot be accepted. In exceptional cases late work must be submitted *directly to the unit of study coordinator* accompanied by an application for Special Consideration as outlined on page 16 of the School of Information Technologies Postgraduate Enrolment Guide.

Assessment results will be published on WebCT or the course web page. Students are required to check their results.

Any errors or omissions must be reported to the unit coordinator, with appropriate evidence, within ten (10) days of being published. Ten days after being published, marks are considered to have been confirmed and will not subsequently be altered.

Deadlines for assignments are set on the assumption that students may experience minor setbacks caused by sickness, computer breakdown etc. In this context, 'minor' means 'causing a delay of up to three working days'. Extensions will not be granted for minor setbacks. It is important to work steadily on assignments as soon as they are given.

7. Details of Assessment Components

7.1 Assignments

There will be a total of three assignments during the course. Each assignment will be worth approximately 25% of the final unscaled assessment mark.

7.2 Written Examination

The written examination will draw from all aspects of the unit of study. It will test the candidates' ability to discuss issues critically and to apply the knowledge learnt during the course to specific situations. Duration of the examination will be two hours.

8. Teaching team

Name	*Room*	*Phone*	*Email*
Joachim Gudmundsson	L5-03 SIT	83060758	joachim.gudmundsson@nicta.com.au
Thomas Wolle	L5-02 SIT	83060757	thomas.wolle@nicta.com.au

9. Textbook and Readings

The main textbook used in this unit is :

M. de Berg, O. Cheong, M. van Kreveld and M. Overmars.
Computational Geometry: Algorithms and Application (3rd ed).
Springer-Verlag, Heidelberg, 2008. ISBN 978-3-540-77973-5.
(2nd edition is also fine).

Details of specific unit of study readings are given on the course website. Other material may be specified through the unit of study web page. All material in the specified readings is examinable.

9.1 Course Web Page

For most recent information on this course, lecture slides, exercises etc. visit WebCT or the course's web page at

http://gudmundsson.biz/comp5045