Unit Outline: KXC354 Computer Graphics & Animation

March - July 2007
Hangzhou, China

Prerequisites
KXC251

Corequisites
None

Unit Weight
12.5% of one academic year

Unit Coordinator
Tony Gray

Lecturing Staff
Miss Xianping Huang
Mr. Tony Gray

Scheduled Teaching Sessions
Lectures: 3 hr/wk
Tutorials: 1 hr/wk (from week 2)

Unit Website
The unit website is accessed from http://www.utas.edu.au/coursesonline/. You will need to use your University of Tasmania email pop account username and password to log on to the WebCT system. Once authenticated by the system your personalised MyWebCT area will be displayed. It contains links to the websites that you have permission to access - including the website for this unit.
This unit is Web Dependent: content. This means that you will need to use the Web for this unit. The unit website contains unit information and resources.
If you are not able to access the unit website, please contact the technical staff at ZUT.

University Website
Information and Resources for 'Current Students' are available on the university website at:
http://www.utas.edu.au/students/

Provider
School of Computing - Faculty of Science, Engineering, and Technology.

OVERVIEW

Introduction
This unit looks at the creation and use of 2- and 3-dimensional graphical information and animations. The mathematical and algorithmic techniques used in generating computer graphics are covered as well as the programming methods to build the tools needed to implement them. Emphasis is placed on object-oriented programming techniques using C++ and OpenGL.

Prior Learning
The student is assumed to have a knowledge of programming in C and a familiarity with algorithms, as covered in the prerequisite unit, Algorithms and Metrics, KXC251. The student is also assumed to have a familiarity with classes and objects (in Java), as covered in the prerequisite unit for KXC251, (Software Process, KXC154).

Learning Outcomes
On successful completion of this unit, you will be able to:

1. Develop programs using existing graphics libraries and object-oriented programming techniques in C++ in both two and three dimensional systems
2. Demonstrate an understanding of the principles of computer graphics and animation, geometry representation, rendering techniques, object hierarchies, and techniques for animating objects within a scene.
3. Use an integrated development environment to develop a complex software project.

Unit Content
Introduction to Computer Graphics:
- applications of computer graphics
- graphics hardware

2 and 3 Dimensional Graphics:
- geometry representations
- transformations, projections & viewing
- programming techniques in C++

Visual Realism:
- colour models
- shading techniques
- texture mapping
- ray tracing & radiosity
Generic Skills

The university has defined a set of generic graduate attributes expected in its graduates. http://www.utas.edu.au/policy/subject.html#graduates Your course is designed to enable you to develop generic skills that are valued in, and expected of, graduates. These are skills that you will need to develop over time. Hence you are encouraged to look for opportunities, as you study each unit, to reflect on and improve these skills.

LEARNING AND TEACHING

Approach to Learning

You are expected to spend about 130 hrs studying in this unit - this includes attendance at scheduled teaching sessions. (For a 13 week semester this is, on average, 10 hr/wk.) This is the amount of study time that the 'typical' student will need to reach the level of competence and understanding required to fulfil the unit objectives.

You are expected to:

- attend all scheduled lectures and tutorials, unless otherwise notified by the unit coordinator
- prepare for, and actively participate in lectures and tutorials
- complete the assigned learning tasks
- review what has been learnt
- complete assessment items and submit them on time
- access and be familiar with the information and resources available on the unit website
- seek help from teaching staff if you have any questions or difficulties in studying this unit

You are encouraged to read the university's Code of Conduct for Teaching and Learning. Part A describes the 'Responsibility of the University to Students' and part B describes the 'Responsibilities of Students to the University'. http://www.utas.edu.au/tl/policies/codes.html

Schedule

See the 'Schedule' section on the unit website.

Teaching and Support Staff

Unit Coordinator:

Tony Gray
E-Mail: A.D.Gray@utas.edu.au

Lecturing Staff

Miss Xianping Huang
Mr. Tony Gray

University Services and Support

The University has staff available to assist you, such as the:

- Learning Development Advisor
- Student Counselor
- Careers Advisor
- Disability Officer

For more information and contact details see the Services and Support section on the University 'Current Students' web page. http://www.utas.edu.au/students/

Resources

Unit Website

The unit website contains unit information and resources.

Prescribed Text

None

Readings

(recommended) OpenGL ARB, OpenGL Programming Guide, Addison Wesley
Foley, Van Dam, Feiner, & Hughes, Introduction to Computer Graphics, Addison Wesley, 1994

Texts covering the C++ programming language and OpenGL will be useful.

Software
The software that you will need to access the unit website and to study this unit, including general purpose software such as word processors, is provided on the computers in the computing labs. If you intend to use software on other computers please check that the versions are compatible.

ASSESSMENT

**Assessment Items**

**Item 1**
- **Title:** Assignment 1
- **Type:** In-Semester - individual assignment
- **Weighting:** 12%
- **Due:** Friday 20th April at 3:00pm (week 7)

**Item 2**
- **Title:** Assignment 2
- **Type:** In-Semester - individual assignment
- **Weighting:** 18%
- **Due:** Tuesday 22nd May at 3:00pm (week 12)

**Item 3**
- **Title:** 3 hr Examination (Closed Book)
- **Type:** Formal Examination
- **Weighting:** 70%
- **Due:** University Examination Period

See the 'Assessment' section in unit website for more detailed information about assessment items.

**In-Semester Assessment**

Unless specifically stated in the specification of the assessment item provided on the unit website, it is required that:

- work submitted by a student is the work of that student alone OR
- where the assessment item is to be completed by a group of students, the work submitted by the group of students is the work of that group of students alone.

Coursework may be developed on alternative platforms and/or with alternative development environments, but assignment and tutorial work will only be assessed on Windows 2000 or Windows XP using the Dev-C++ IDE. Any student using another environment must ensure that their submission works on the assessment environment.

**Plagiarism**

Plagiarism is a form of cheating. It is taking and using someone else's thoughts, writings or inventions and representing them as your own, for example:

- using an author's words without putting them in quotation marks and citing the source;
- using an author's ideas without proper acknowledgment and citation; or
- copying another student's work.

**If you have any doubts about how to refer to the work of others in your assignments, please consult your lecturer or tutor for relevant referencing guidelines, and the academic integrity resources on the web at http://www.utas.edu.au/tl/supporting/academicintegrity/index.html.**

The intentional copying of someone else's work as one's own is a serious offence punishable by penalties that may range from a fine or deduction/cancellation of marks and, in the most serious of cases, to exclusion from a unit, a course or the University. Details of penalties that can be imposed are available in the Ordinance of Student Discipline – Part 3 Academic Misconduct, see http://www.utas.edu.au/policy/subject.html#students.

The University reserves the right to submit assignments to plagiarism detection software, and might then retain a copy of the assignment on its database for the purpose of future plagiarism checking.

**Referencing**

The university document on plagiarism contains information about referencing the work or ideas of others. (See http://www.utas.edu.au/plagiarism/.) The preferred text referencing systems for the School is the Harvard system (also referred to as the author-date system).

**Submissions**

The details of the submission method (paper, electronic or other) for each assignment will be supplied in a separate assignment specification sheet. All in-semester assignment submissions
(including electronic submissions) are to include an Assignment Cover Sheet which includes a statement confirming that the submission is your own work. If this undertaking is not signed, the assignment will not be marked. The Assignment Cover Sheet is available on the School’s web site http://www.comp.utas.edu.au/app/studyresources.jsp.

**Extensions**

Assessment items will not be accepted after the due date except under the conditions stated in the school policy on late assessment. [http://www.comp.utas.edu.au/app/late_assess.jsp](http://www.comp.utas.edu.au/app/late_assess.jsp)

**Formal Examination**

The formal examination will be held at ZUT, Hangzhou, and is conducted by the University Registrar.

**Final Grade**

Overall assessment will be based on the student’s performance throughout the semester as well as in a formal examination. In order to achieve a pass (or better) result, a student must obtain:

1. at least 45% of the total mark for in-semester assessment items
2. at least 45% of the mark for the formal examination
3. at least 50% of the overall mark

In order to comply with the benchmarks set by the Faculty of Science, Engineering & Technology for distribution of grades in units, both the in-semester and examination marks that students obtain may be adjusted either upwards or downwards. See [http://fcms.its.utas.edu.au/scieng/scieng/policies.asp](http://fcms.its.utas.edu.au/scieng/scieng/policies.asp) for details of the Faculty Assessment Guidelines.

Passing grades will be awarded based on the AVCC guidelines:

- PP at least 50% of the overall mark but less than 60%
- CR at least 60% of the overall mark but less than 70%
- DN at least 70% of the overall mark but less than 80%
- HD at least 80% of the overall mark

The maximum mark awarded to a student who fails the unit will be 44.

For more information, including other grades such as Supplementary and Terminating grades, see the School of Computing’s guidelines for assessment - available at: [http://www.comp.utas.edu.au/app/assess.jsp](http://www.comp.utas.edu.au/app/assess.jsp)