Unit Outline: KXA353 Software Systems

Semester 1, 2004

Sandy Bay Campus, Hobart
Newnham Campus, Launceston

Prerequisites
KXA253

Corequisites
None

Unit Weight
12.5% of one academic year

Unit Coordinator
Dr. Vishv Malhotra

Scheduled Teaching Sessions
Lectures: 3 hr/wk
Tutorials: 1 hr/wk (starts week 2, 10 tut./lab. sessions)
The Unit Timetable can be accessed from the Study Resources section of the School website. ([http://www.comp.utas.edu.au/app/studyresources.jsp](http://www.comp.utas.edu.au/app/studyresources.jsp)).
Launceston lectures will be delivered via video conference from Hobart.

Unit Website
The unit website is accessed from [http://webct.utas.edu.au:8900/](http://webct.utas.edu.au:8900/). You will need to use your university 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 University IT help desk:
  Entrance Level, Morris Miller Library, Sandy Bay Campus;
  Entrance Level, Launceston Campus Library, Newnham Campus.
  Telephone: 6226 1818 and 1300 304 903.
  Email: servicedesk@utas.edu.au

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

Provider
School of Computing - Faculty of Science, Engineering, and Technology. [http://www.comp.utas.edu.au](http://www.comp.utas.edu.au)

OVERVIEW

Introduction
Provides theoretical basis and practical experiences of the contemporary concurrent and distributed software system practices. Analysis techniques - formal methods for expressing and establishing the correctness and other properties of sequential and concurrent programs. Concurrent programming - threads, thread synchronisation, and common design/programming patterns for interference-free interaction among concurrent threads. Distributed systems - client-server and other distributed object models; modern inter-object communication paradigms: RMI, Servlets and CORBA.

Prior Learning
Students with some familiarity with maths and above average aptitude for algorithms will find the unit more interesting.

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

1. Formally express and infer correctness properties of (simple) sequential and concurrent software systems.
2. Develop concurrent systems and understand the nature of safety and liveness concerns in the concurrent systems.
3. Use common modern technologies for developing distributed/concurrent systems.

Unit Content

Formal Methods:
1. Introduction/revision of required mathematical formalisms
2. Correctness of deterministic, sequential programs
3. Concurrent systems -- safety and progress properties
Concurrent Systems:
1. Concurrent systems -- safety and progress properties
2. Java threads
3. Patterns for developing concurrent programs

Distributed Systems:
1. Java RMI
2. Servlets
3. CORBA
4. Security issues

For more information see the section titled 'Content' on the unit website.

Generic Skills
The university has defined a set of generic graduate attributes expected in its graduates. http://www.admin.utas.edu.au/HANDBOOKS/UTASHANDBOOKS/RULES/POLGEN.html. 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

There will be a total of 10 lab. sessions and tutorials during the semester. Every student must attend all sessions. Each student will be expected to maintain a separate book (64-page small notebook is adequate). The students will record all their tutorial and lab. activities in the book on the day they do the tutorial or lab work. During the semester, tutors will mark these records for each student at least 2 or more times. An assessment will occur only during the tut./lab. session by picking students to be marked at random. If a student chosen for assessment is not attending the session a mark of 0 will be entered for that assessment. Total marks for tutorial/laboratory work is 5%.

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.admin.utas.edu.au/HANDBOOKS/UTASHANDBOOKS/RULES/CTEA.html

Schedule
See the 'Schedule' section on the unit website.

Teaching and Support Staff

Teaching Staff
Unit Coordinator:

Dr. Vishv Malhotra
E-Mail: Vishv.Malhotra@utas.edu.au
Phone: Hbt 2944 Ltn 3695
Room: 456, Sandy Bay Campus, Hobart

Lecturing Staff

Newnham Campus, Launceston: Dr. Vishv Malhotra
Sandy Bay Campus, Hobart: Dr. Vishv Malhotra

School Help Desk

Contact the School Help Desk if you have any queries or problems with accessing, using, or printing from the computers in the School of Computing labs.
• **Hobart**: the Help Desk is located near the School's reception desk and is open in the morning from 9-11, and in the afternoon from 12-2, Monday-Friday. The phone number is 6226 2960.
• **Launceston**: the Help Desk is located near the entrance to the computing labs and is open in the morning from 10-12, and in the afternoon from 2-4:30, Monday-Thursday. On Fridays it is open from 10-12 in the morning and 2-4 in the afternoon. The phone number is 6324 3447.
• **Burnie**: the computer labs at the NWC are maintained by ITS. Please contact the University Help Desk for assistance. The 6 Macs are maintained by the School of Computing. If you have a query or problem that is specific to the School of Computing please phone the School of Computing Help Desk in Launceston.

**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/](http://www.utas.edu.au/students/)

**Resources**

**Unit Website**

The unit website contains unit information and resources. Students are expected to print their lecture notes from the unit website. Lecture notes for each week will be available on the website at the start of the corresponding week.

**Prescribed Text**

These are only recommended books. Students will be provided extensive lecture notes on the web.


**Readings**


**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 School's computing labs. If you intend to use software on other computers please check that the versions are compatible.

Programs and other executable code, where necessary, will be made available in the 'Resources' section of the unit website (details will be specified later).

**Computing Facilities**

The School has PC labs (Windows XP), Mac labs (Mac OS-X 10.3), and Networking labs at the Newnham and Sandy Bay campuses. It also maintains 6 Macs (Mac OS-X 10.3) at the NW Centre. Unix accounts can be accessed from all Macs and PCs.
If you have not used these facilities before please contact the School Help Desk to organise your account details. If you would like to access the facilities at the Newnham and Sandy Bay campuses after hours please contact the School Help Desk.

Please contact the School Help Desk if you have difficulty accessing or using these facilities.

**Use of Facilities**

Use of computing facilities provided by the School is subject to the School's Ethics Guidelines - [http://www.comp.utas.edu.au/app/ethics.jsp](http://www.comp.utas.edu.au/app/ethics.jsp). Copies of the guidelines are also available in all School labs. The School's facilities may only be used for study-related purposes, and may not be used for personal gain. The playing of games is strictly prohibited in all labs at all times. Before being granted access to the School's facilities, you will be required to sign a declaration that you have read and understand these guidelines, and that you will abide by them. Disciplinary action may be taken against students who violate the guidelines.

**Occupational Health and Safety**

The university is committed to providing a safe and secure teaching and learning environment. For more information see [http://www.admin.utas.edu.au/hr/ohs/pol_proc/](http://www.admin.utas.edu.au/hr/ohs/pol_proc/)

**ASSESSMENT**

**Assessment Items**

**Item 1**

- **Title:** Assignment 1
- **Type:** In-Semester - group assignment
- **Weighting:** 13%
- **Due:** 07 April 2004 Wednesday 12 Noon

Groups of 1 or 2 students.

**Item 2**

- **Title:** Assignment 2
- **Type:** In-Semester - group assignment
- **Weighting:** 12%
- **Due:** 21 May 2004 Friday 12 Noon

Groups of 1 or 2 students. A student can not have the same partner in both assignments.

**Item 3**

- **Title:** Laboratory and Tutorial Work Reports
- **Type:** In-Semester - learning tasks
- **Weighting:** 5%
- **Due:** 2 assessments at random during tut/lab sessions

Maintain a separate notebook for recording all tutorial and laboratory activities as you attend the tutorials/laboratories. Students will be randomly picked in their scheduled sessions for assessment. Their record will be checked to see if they are have been regular and active in their tutorial/laboratory. Grades assigned will be S(atisfactory), U(nsatisfactory) and 0. There will be 2 assessments for each student during the semester. An extra assessment will be done for those with a 0.

**Item 4**

- **Title:** 3 hr Examination
- **Type:** Formal Examination
- **Weighting:** 70%
- **Due:** University Examination Period

It is the intention of the lecturer to have about 25-30% assessible marks of the unit allocated to formal method; about 35-40% marks to concurrent systems; and 30-35% marks for distributed systems.

All questions in the examination will be required to be attempted.

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.

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

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 from the School Help Desk in Launceston and Hobart, and 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

Formal Examination

The formal examination is conducted by the University Registrar. The 'Current Students' section on the university website contains information about the conduct of, and timetable for, formal examinations.

The School requires that a student enrolled in this unit must attend at least two thirds of the tutorials. Attendance records will be kept by the School, and a student not attending the minimum number of tutorials will be excluded from the examination unless specifically permitted to take the examination by the Head of the School.

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 40% of the total mark for in-semester assessment items
2. at least 40% of the mark for the formal examination
3. at least 50% of the overall mark

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