Prerequisites

KXA151

Corequisites

None

Unit Weight

12.5

Unit Coordinator

Dr. Shuxiang Xu
Room V173
(03) 6324 3416
Shuxiang.Xu@utas.edu.au

Scheduled Teaching Sessions

Campuses:

- Launceston
- Hobart

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

The Unit Timetable can be accessed from the Study Resources section of the School website. (http://www.comp.utas.edu.au/app/studyresources.jsp).

Unit Website

The unit website is accessed from http://webct.utas.edu.au:8900. You will need to use your 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 Supplemented. This means that the use of the Web is optional 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:

- Level 2 Morris Miller Library, Sandy Bay Campus; Level 0 Building A, Newnham Campus.
- Website: http://www.utas.edu.au/helpdesk
- Telephone: 6226 1818
- Fax: 6226 7669
- Email: HelpDesk@utas.edu.au

Prescribed Text

Students are advised to have good access to the following books (but not necessarily a personal copy):

Main text:

The following text is for tutorials and weeks 2-4 lectures:

Provider

School of Computing - Faculty of Science, Engineering, and Technology. http://www.comp.utas.edu.au

Useful University Web Links

Information and Resources for 'Current Students' are available on the university website at: http://www.utas.edu.au/students/. It includes useful links such as:


OVERVIEW
Introduction

In this unit the approach is based on theoretical issues and practical work. Lectures will review computer architecture, with an emphasis on new technologies and trends, cover the concepts of processes, mutual exclusion and deadlock, and discuss general algorithms for scheduling, memory management and I/O processing. Upon completion of this unit the student should be able to demonstrate a practical understanding of operating system architecture, and the functions of operating system components, explain the relationships between the operating system modules, and design and implement some operating system functions in commonly used operating systems environments.

Objectives

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

1. Articulate the basic principles and management of modern operating systems
2. Use a multiuser operating systems to implement a broad range of system level tasks
3. Beware of security implications of multiuser, networked operating systems
4. Understand and analyse hypes and implications of new developments

Unit Content

Operating Systems:
- Need for an operating system
- Components of an operating system
- How do the components work

UNIX:
- Unix file system
- Unix shells and shell programming
- Protection and Security:
  - File protection and access rights

Processes:
- What is a process?
- Process state
- Threads
- Interrupt handling, CPU context switching

Interprocess Communication and Synchronization:
- Producer/consumer implementation
- Critical sections
- Mutual exclusion and synchronization
- Solutions: strict alternation, Peterson's solution
- Deadlock

CPU Scheduling, Memory Management:
- Swapping
- Virtual Memory
- Paging, segmentation
- Page replacement algorithms

File System:
- Basics
- RAID
- Secondary storage management, disk head scheduling
- File system design
- File system performance, caching, free space management
- Distributed file systems

Input/Output:
- Device types
- Device interface

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/academic/acservices/meetings/Senate/Appendix/3_01D1.doc](http://www.admin.utas.edu.au/academic/acservices/meetings/Senate/Appendix/3_01D1.doc) 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.admin.utas.edu.au/HANDBOOKS/UTASHANDBOOKS/RULES/CTEA.html](http://www.admin.utas.edu.au/HANDBOOKS/UTASHANDBOOKS/RULES/CTEA.html)

### Schedule

See the 'Schedule' section on the unit website for the timetable and associated resources.

### Teaching and Support Staff

#### Teaching Staff

**Unit Coordinator:**

Lecturer: Dr. Shuxiang Xu  
E-Mail: Shuxiang.Xu@utas.edu.au  
Phone: (03) 6324 3416  
Room: V173

#### Lecturing Staff

No Lectures Scheduled

### 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 12-1 and 2-4, 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 3654.
- **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.

#### Prescribed Text

Students are advised to have good access to the following books (but not necessarily a personal copy):

**Main text:**

The following text is for tutorials and weeks 2-4 lectures:
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.

Computing Facilities

The School has PC labs (Windows 2000 Professional), Mac labs (Mac OS-X 10.2), Unix labs (linux / X-windows), and Networking labs at the Newnham and Sandy Bay campuses. It also maintains 6 Macs (Mac OS-X 10.2) at the NW Centre.

If you have not used these facilities before please contact the School Help Desk to organise you 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.

Ethical 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/ohs.pdf](http://www.admin.utas.edu.au/hr/ohs/pol_proc/ohs.pdf)

ASSESSMENT

Assessment Items

**Item 1**

- **Title:** Assignment 1
- **Type:** In-Semester - individual assignment
- **Weighting:** 15%
- **Due:** 5pm, 1 September (Monday Week 8)

Unix shell programming.

**Item 2**

- **Title:** Assignment 2
- **Type:** In-Semester - individual assignment
- **Weighting:** 15%
- **Due:** 5pm, 15 October (Wednesday Week 13)

Java or C/C++ programming.

**Item 3**

- **Title:** 3 hr Examination
- **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.

Assignment submissions will not be considered for assessment unless they are 100% compatible with the
School environment.

**Plagiarism**

Plagiarism is taking and using someone else's thoughts, writings, or inventions and representing them as your own; for example downloading an essay from a cheat site, copying another student's work, or using an author's words or ideas without citing the source. Plagiarism is a form of cheating. It is a University offence punishable by a range of penalties including a fine or deduction/cancellation of marks and, in the most serious of cases, exclusion from a unit, a course, or the University. **When in doubt consult your lecturer or tutor.** Details of penalties that can be imposed are available in the Ordinance of Student Discipline or at [http://www.utas.edu.au/plagiarism](http://www.utas.edu.au/plagiarism).

**Referencing**

The university document on plagiarism contains information about referencing the work or ideas of others. The preferred text referencing systems for the School is the Harvard system (also referred to as the author-date system). For information on the Harvard system see [http://www.utas.edu.au/library/assist/gpoa/gpoa2.html](http://www.utas.edu.au/library/assist/gpoa/gpoa2.html).

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

**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](http://www.comp.utas.edu.au/app/assess.jsp)