



MONASH University
Information Technology

FIT2070
Operating systems

Unit Guide

Semester 2, 2012

The information contained in this unit guide is correct at time of publication. The University has the right to change any of the elements contained in this document at any time.

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FIT2070 Operating systems - Semester 2, 2012

This unit covers software organisation of multi-user and multi-tasking computers. The principles of operating systems are covered with reference to the underlying hardware requirements and are illustrated by case studies. Topics include operating system structure and services, multi-programming processes, CPU scheduling, memory management, device management, synchronisation, deadlocks, virtual memory and file systems.

Mode of Delivery

Clayton (Day)

Contact Hours

2 hrs lectures/wk, 3 hr laboratory/fortnight, 1 hr tutorial/fortnight

Workload

You are expected to spend 12 hours per week on various activities including reading, communication with other students and unit lecturers, and preparation for learning tasks and formal assessments.

Unit Relationships

Prohibitions

CSE2302, FIT2022

Prerequisites

([FIT1031](#) or FIT1001) and ([FIT1008](#) or FIT1015)

Chief Examiner

Professor Bala Srinivasan

Campus Lecturer

Clayton

Bala Srinivasan

Consultation hours: 10-12 Mon, Tue, Wed

Academic Overview

Outcomes

At the completion of this unit students will have:

A knowledge and understanding of:

- operating systems as resource managers for CPU context switching, process scheduling and job scheduling;
- memory management and virtual memory systems; I/O device drivers and management;
- file subsystems;
- resource allocation strategies;
- asynchronous and synchronous communication mechanisms and their use in operating systems;
- the philosophy and implementation of interprocess communication and its use in distributed computer systems.

Developed the skills to:

- program OS components, such as job and process schedulers, page replacement algorithms, and file management subsystems, as well as programming interrupt handlers and context switching.

Graduate Attributes

Monash prepares its graduates to be:

1. responsible and effective global citizens who:

- a. engage in an internationalised world
- b. exhibit cross-cultural competence
- c. demonstrate ethical values

critical and creative scholars who:

- a. produce innovative solutions to problems
- b. apply research skills to a range of challenges
- c. communicate perceptively and effectively

Assessment Summary

Examination (3 hours): 60%; In-semester assessment: 40%

Assessment Task	Value	Due Date
Assignment	40%	Weeks 6, 8, 10 and 12 for each part respectively
Examination 1	60%	To be advised

Teaching Approach

Lecture and tutorials or problem classes

This teaching and learning approach provides facilitated learning, practical exploration and peer learning.

- The lectures define the formal content of the unit, and will be used as the initial point of reference for unit knowledge outcomes. This knowledge will be built upon by the tutorials and laboratories in order to address the higher level objectives relating to skills and application.
- The tutorials are designed to reinforce lecture materials, and to prepare the student to apply these understandings towards building the skills required to complete the laboratory sessions. Tutorials will provide the opportunity to explore further the concepts discussed in the class as well as look at some specific cases or examples.
- The laboratories are designed to give the student hands-on experience of operating system functions and parameters. Each lab is offered as a partially developed set of programming exercises. The students need to understand the workings of the program and develop extensions to meet the requirements. The lab work is a required part of the assessment component although they are not marked. Students can interact with others in the lab as a means of peer learning.

Feedback

Our feedback to You

Types of feedback you can expect to receive in this unit are:

- Informal feedback on progress in labs/tutes
- Graded assignments with comments
- Solutions to tutes, labs and assignments

Your feedback to Us

Monash is committed to excellence in education and regularly seeks feedback from students, employers and staff. One of the key formal ways students have to provide feedback is through SETU, Student Evaluation of Teacher and Unit. The University's student evaluation policy requires that every unit is evaluated each year. Students are strongly encouraged to complete the surveys. The feedback is anonymous and provides the Faculty with evidence of aspects that students are satisfied and areas for improvement.

For more information on Monash's educational strategy, and on student evaluations, see:

<http://www.monash.edu.au/about/monash-directions/directions.html>

<http://www.policy.monash.edu/policy-bank/academic/education/quality/student-evaluation-policy.html>

Previous Student Evaluations of this unit

2011 feedback was for more practical assignments and less lecture slides - both suggestions will be incorporated in this offering.

If you wish to view how previous students rated this unit, please go to

<https://emuapps.monash.edu.au/unitevaluations/index.jsp>

Prescribed text(s)

Limited copies of prescribed texts are available for you to borrow in the library.

William Stallings. (2011). *Operating Systems: Internals and Design Principles*. (7th) Prentice Hall.

Recommended Resources

SSH client to access the server from outside the Monash network.

Unit Schedule

Week	Activities	Assessment
0	Enroll for the lab and tutorial classes	No formal assessment or activities are undertaken in week 0
1	Computer Systems Overview	
2	Operating Systems Overview	
3	Process Description and Control	
4	Threads	
5	Concurrency: Mutual Exclusion and Synchronization	
6	Concurrency: Deadlock and Starvation	Assignment part 1 due
7	Memory Management	
8	Virtual Memory	Assignment part 2 due
9	Uniprocessor Scheduling	
10	I/O Management, Disk Scheduling	Assignment part 3 due
11	File Management	
12	Security, Networking and Summary	Assignment part 4 due
	SWOT VAC	No formal assessment is undertaken in SWOT VAC
	Examination period	LINK to Assessment Policy: http://policy.monash.edu.au/policy-bank/academic/education/assessment/assessment-in-coursework-policy.html

*Unit Schedule details will be maintained and communicated to you via your MUSO (Blackboard or Moodle) learning system.

Assessment Requirements

Assessment Policy

Faculty Policy - Unit Assessment Hurdles

(<http://www.infotech.monash.edu.au/resources/staff/edgov/policies/assessment-examinations/unit-assessment-hu>)

Academic Integrity - Please see the Demystifying Citing and Referencing tutorial at

<http://lib.monash.edu/tutorials/citing/>

Assessment Tasks

Participation

- **Assessment task 1**

Title:

Assignment

Description:

The assignment has 4 parts. The first three parts requires development of programs (either in Java, C or Unix Shell) to implement user interfaces, concurrent execution of pthreads, and memory management simulation. The last part is a written assessment where you will identify solutions to some of the issues in operating systems.

The objectives of this assignment are to:

- ◆ Understand how different components of operating systems work
- ◆ Develop concurrent programs
- ◆ Learn a programming language to use (Java, C, Python, Shell, etc.)
- ◆ Demonstrate that you have understood the principles and componets of OS

Weighting:

40%

Criteria for assessment:

Completion of the program, together with a reflection on the efficiency of the code.

Due date:

Weeks 6, 8, 10 and 12 for each part respectively

Examinations

- **Examination 1**

Weighting:

60%

Length:

3 hours

Type (open/closed book):

Closed book

Electronic devices allowed in the exam:

None

Assignment submission

It is a University requirement (<http://www.policy.monash.edu/policy-bank/academic/education/conduct/plagiarism-procedures.html>) for students to submit an assignment coversheet for each assessment item. Faculty Assignment coversheets can be found at <http://www.infotech.monash.edu.au/resources/student/forms/>. Please check with your Lecturer on the submission method for your assignment coversheet (e.g. attach a file to the online assignment submission, hand-in a hard copy, or use an online quiz).

Online submission

If Electronic Submission has been approved for your unit, please submit your work via the VLE site for this unit, which you can access via links in the my.monash portal.

Extensions and penalties

Submission must be made by the due date otherwise penalties will be enforced.

You must negotiate any extensions formally with your campus unit leader via the in-semester special consideration process:

<http://www.infotech.monash.edu.au/resources/student/equity/special-consideration.html>.

Returning assignments

Students can expect assignments to be returned within two weeks of the submission date or after receipt, whichever is later.

Other Information

Policies

Monash has educational policies, procedures and guidelines, which are designed to ensure that staff and students are aware of the University's academic standards, and to provide advice on how they might uphold them. You can find Monash's Education Policies at:

<http://policy.monash.edu.au/policy-bank/academic/education/index.html>

Key educational policies include:

- Plagiarism
(<http://www.policy.monash.edu/policy-bank/academic/education/conduct/plagiarism-policy.html>)
- Assessment
(<http://www.policy.monash.edu/policy-bank/academic/education/assessment/assessment-in-coursework-p>)
- Special Consideration
(<http://www.policy.monash.edu/policy-bank/academic/education/assessment/special-consideration-policy.h>)
- Grading Scale
(<http://www.policy.monash.edu/policy-bank/academic/education/assessment/grading-scale-policy.html>)
- Discipline: Student Policy
(<http://www.policy.monash.edu/policy-bank/academic/education/conduct/student-discipline-policy.html>)
- Academic Calendar and Semesters (<http://www.monash.edu.au/students/key-dates/>);
- Orientation and Transition (<http://www.infotech.monash.edu.au/resources/student/orientation/>);
and
- Academic and Administrative Complaints and Grievances Policy
(<http://www.policy.monash.edu/policy-bank/academic/education/management/complaints-grievance-policy>)
- Codes of Practice for Teaching and Learning
(<http://www.policy.monash.edu.au/policy-bank/academic/education/conduct/suppdocs/code-of-practice-tea>)

Student services

The University provides many different kinds of support services for you. Contact your tutor if you need advice and see the range of services available at www.monash.edu.au/students. For Sunway see <http://www.monash.edu.my/Student-services>, and for South Africa see <http://www.monash.ac.za/current/>

The Monash University Library provides a range of services and resources that enable you to save time and be more effective in your learning and research. Go to <http://www.lib.monash.edu.au> or the library tab in my.monash portal for more information. At Sunway, visit the Library and Learning Commons at <http://www.lib.monash.edu.my/>. At South Africa visit <http://www.lib.monash.ac.za/>.

Academic support services may be available for students who have a disability or medical condition. Registration with the Disability Liaison Unit is required. Further information is available as follows:

- Website: <http://monash.edu/equity-diversity/disability/index.html>;
- Email: dlu@monash.edu
- Drop In: Equity and Diversity Centre, Level 1 Gallery Building (Building 55), Monash University, Clayton Campus, or Student Community Services Department, Level 2, Building 2, Monash University, Sunway Campus
- Telephone: 03 9905 5704, or contact the Student Advisor, Student Community Services at 03 55146018 at Sunway