



MONASH University
Information Technology

FIT2070
Operating systems

Unit Guide

Semester 2, 2013

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, 2013

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 requirements

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

B Srinivasan

Academic Overview

Learning 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.

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 | Part A of Assignment due |
| 7 | Memory Management | |
| 8 | Virtual Memory | Part B of Assignment due |
| 9 | Uniprocessor Scheduling | |
| 10 | I/O Management, Disk Scheduling | Part C of Assignment due |
| 11 | File Management | |
| 12 | Security, Networking and Summary | Part D of Assignment 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 learning system.

Assessment Summary

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

| Assessment Task | Value | Due Date |
|--------------------------|-------|--|
| Assignment (Programming) | 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.

Unit Schedule

- 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.

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 (Programming)

Description:

The assignment has 4 parts. All the parts require development of programs (either in Java, C, Python or Unix Shell) to implement user interfaces, concurrent execution of pthreads, and memory management simulator.

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 components of OS

Weighting:

40%

Criteria for assessment:

Completion of a working 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

Learning resources

Monash Library Unit Reading List

<http://readinglists.lib.monash.edu/index.html>

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

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.monash.edu.au/exams/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.

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). Please note that it is your responsibility to retain copies of your assessments.

Online submission

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

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 Edition) Prentice Hall.

Assessment Requirements

Recommended Resources

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

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:

www.policy.monash.edu.au/policy-bank/academic/education/index.html

Key educational policies include:

- Academic integrity;
<http://www.policy.monash.edu/policy-bank/academic/education/conduct/student-academic-integrity-policy.html>
- Assessment in Coursework Programs;
<http://www.policy.monash.edu/policy-bank/academic/education/assessment/assessment-in-coursework-policy.html>
- Special Consideration;
<http://www.policy.monash.edu/policy-bank/academic/education/assessment/special-consideration-policy.html>
- 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/dates/>
- Orientation and Transition; <http://intranet.monash.edu.au/infotech/resources/students/orientation/>
- Academic and Administrative Complaints and Grievances Policy;
<http://www.policy.monash.edu/policy-bank/academic/education/management/complaints-grievance-policy.html>
- Code of Practice for Teaching and Learning;
<http://www.policy.monash.edu.au/policy-bank/academic/education/conduct/suppdocs/code-of-practice-teaching-and-learning.html>

Graduate Attributes Policy

<http://www.policy.monash.edu/policy-bank/academic/education/management/monash-graduate-attributes-policy.html>

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 <http://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/>.

Monash University Library

The Monash University Library provides a range of services, resources and programs that enable you to save time and be more effective in your learning and research. Go to 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/>.

Disability Liaison Unit

Students who have a disability or medical condition are welcome to contact the Disability Liaison Unit to discuss academic support services. Disability Liaison Officers (DLOs) visit all Victorian campuses on a regular basis.

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

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 the Student Evaluation of Teaching and Units (SETU) survey. 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, see:

www.monash.edu.au/about/monash-directions and on student evaluations, see:
www.policy.monash.edu/policy-bank/academic/education/quality/student-evaluation-policy.html

Previous Student Evaluations of this Unit

Previous student feedback has asked 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>