



MONASH University
Information Technology

FIT2070
Operating systems

Unit Guide

Semester 2, 2015

Copyright © Monash University 2014. All rights reserved. Except as provided in the Copyright Act 1968, this work may not be reproduced in any form without the written permission of the host Faculty and School/Department.

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.

Last updated: 17 Jul 2015

Table of Contents

<u>FIT2070 Operating systems - Semester 2, 2015</u>	1
<u>Mode of Delivery</u>	1
<u>Workload Requirements</u>	1
<u>Unit Relationships</u>	1
<u>Prohibitions</u>	1
<u>Prerequisites</u>	1
<u>Chief Examiner</u>	1
<u>Campus Lecturer</u>	1
<u>Clayton</u>	2
<u>Malaysia</u>	2
<u>Your feedback to Us</u>	2
<u>Previous Student Evaluations of this Unit</u>	2
<u>Academic Overview</u>	3
<u>Learning Outcomes</u>	3
<u>Unit Schedule</u>	4
<u>Teaching Approach</u>	4
<u>Assessment Summary</u>	5
<u>Assessment Requirements</u>	6
<u>Assessment Policy</u>	6
<u>Assessment Tasks</u>	6
<u>Participation</u>	6
<u>Examinations</u>	6
<u>Examination 1</u>	6
<u>Learning resources</u>	7
<u>Feedback to you</u>	7
<u>Extensions and penalties</u>	7
<u>Returning assignments</u>	7
<u>Assignment submission</u>	7
<u>Online submission</u>	7
<u>Prescribed text(s)</u>	7
<u>Recommended Resources</u>	8
<u>Other Information</u>	9
<u>Policies</u>	9
<u>Faculty resources and policies</u>	9
<u>Graduate Attributes Policy</u>	9
<u>Student Charter</u>	9
<u>Student services</u>	9
<u>Monash University Library</u>	9
<u>Disability Liaison Unit</u>	9
<u>Other</u>	10
<u>Engineers Australia Stage 1 competencies</u>	10
<u>Relationship between Unit Learning Outcomes and BSE Course Outcomes</u>	11
<u>Relationship between Unit Learning Outcomes and Assessments</u>	11

FIT2070 Operating systems - Semester 2, 2015

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)
- Malaysia (Day)

Workload Requirements

Minimum total expected workload equals 12 hours per week comprising:

(a.) Contact hours for on-campus students:

- 2 hours of lectures
- One 3-hour laboratory or one 1-hour tutorial (alternating weekly)

(b.) Additional requirements (all students):

- A minimum of 7-9 hours independent study per week for completing lab and project work, private study and revision.

See also Unit timetable information

Unit Relationships

Prohibitions

CSE2302, FIT2022

Prerequisites

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

Chief Examiner

Professor Bala Srinivasan

Campus Lecturer

Clayton

Peter Tischer

Consultation hours: TBA

Malaysia

Chen Woon Wee

Consultation hours: TBA

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>

Academic Overview

Learning Outcomes

At the completion of this unit students should be able to:

1. analyse and evaluate various strategies used by an operating system in managing the system resources and running applications efficiently;
2. analyse and identify parameters that can improve the performance of multi-programming operating systems;
3. apply the principle of synchronisation in developing distributed applications; and
4. show the applicability of OS techniques and mechanisms to the wider context of computing.

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.

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.

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

Assessment Requirements

Assessment Policy

Faculty Policy - Unit Assessment Hurdles

(<http://intranet.monash.edu.au/infotech/resources/staff/edgov/policies/assessment-examinations/assessment-hurdles>)

Academic Integrity - Please see resources and tutorials at

<http://www.monash.edu/library/skills/resources/tutorials/academic-integrity/>

Assessment Tasks

Participation

- **Assessment task 1**

Title:

Assignment (Programming)

Description:

Learning Outcomes: 1,2,3,4. 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 (if applicable to the unit)
<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/student-academic-integrity-managing-pla>) 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 electronic submission). 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

Faculty resources and policies

Important student resources including Faculty policies are located at

<http://intranet.monash.edu.au/infotech/resources/students/>

Graduate Attributes Policy

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

Student Charter

www.opq.monash.edu.au/ep/student-charter/monash-university-student-charter.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 Malaysia 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 Malaysia, 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 Malaysia
- 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, Malaysia Campus

Other

Engineers Australia Stage 1 competencies

This unit is a core unit in the Bachelor of Software Engineering accredited by Engineers Australia. Engineers Australia Accreditation Policy of Professional Engineering Programs requires that programs demonstrate how engineering graduates are prepared for entry to the profession and achieve Stage 1 competencies. The following information describes how this unit contributes to the development of these competencies for the Bachelor of Software Engineering. (Note: not all competencies may be emphasised in this unit).

Stage 1 competency

How the competency is developed in this unit

1. Knowledge and Skills base

1.1. **Comprehension, theory based understanding** of the underpinning natural and physical sciences and the engineering fundamentals applicable to the engineering discipline.

This unit covers operating systems which fall under fundamental knowledge (computing foundations) for the software engineering discipline, as stated in SWEBOK. This element of competency is covered by lecture notes, practical exercises and assignments.

1.2. **Conceptual understanding** of the mathematics, numerical analysis, statistics, and computer and information sciences, which underpin the engineering discipline.

This is covered by the unit considering operating systems is a topic in computer science.

1.3. **In-depth understanding** of specialist bodies of knowledge within the engineering discipline.

The unit addresses one aspect of SWEBOK (Software Engineering Body of Knowledge) - Computing Foundations for software engineers.

1.4. **Discernment** of knowledge development and research directions within the engineering discipline.

Some aspects of identifying and applying current developments and emerging technologies are covered in the unit.

1.5. **Knowledge** of engineering design practice and contextual factors impacting the engineering discipline.

Not covered in this unit.

1.6. **Understanding** of the scope, principles, norms, accountabilities and bounds of sustainable engineering practice in the specific discipline.

Not covered in this unit.

2. Engineering application ability

2.1. **Application** of established engineering methods to complex engineering problem solving.

Students need to apply some aspects of engineering methods to solve operating system problems..

2.2 **Fluent application** of engineering techniques, tools and resources.

Some techniques and tools are applied to solve operating system problems.

2.3. **Application** of systematic engineering synthesis and design processes.

Not covered in this unit.

2.4. **Application** of systematic approaches to the conduct and management of engineering projects.

Not covered in this unit.

3. Professional and personal attributes

3.1. **Ethical** conduct and professional accountability.

Not covered in this unit.

Other Information

- 3.2. **Effective** oral and written communication in professional and lay domains. Precise languages and notations are employed in lectures and assignments. Students need also to write programs and produce reports as part of their assignment assessment.
- 3.3. **Creative**, innovative and proactive demeanour. Developing programs is inherently a creative endeavour.
- 3.4. **Professional** use and management of information. Not covered in this unit.
- 3.5. **Orderly** management of self, and professional conduct. Not covered in this unit.
- 3.6. **Effective** team membership and team leadership. Not covered in this unit.

Relationship between Unit Learning Outcomes and BSE Course Outcomes

No.	CO 1	CO 2	CO 3	CO 4	CO 5	CO 6	CO 7	CO 8	CO 9	CO 10	CO 11	CO 12	CO 13
1	X	X			X	X							X
2	X	X	X		X	X	X						X
3	X	X	X										
4	X	X	X									X	

Relationship between Unit Learning Outcomes and Assessments

No.	Assignments	Quizzes	Practical Exercises	Exam
1	X		X	X
2	X		X	X
3			X	X
4	X		X	X