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**FIT2065 Operating systems and the Unix environment - Semester 1, 2013**

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FIT2065 Operating systems and the Unix environment - Semester 1, 2013

The main topics covered in this unit include computer systems, operating systems, process management and coordination, memory management including modern implementations of virtual memory, file systems, operating system security, shell variant scripting, regular expressions, Unix utilities, Unix file system, Unix system administration and installation, Unix programming, research and development.

Mode of Delivery

Caulfield (Day)

Contact Hours

2 hrs lectures/wk, 2 hrs laboratories/wk

Workload requirements

There are 4 contact hours for this unit per week:

- 2 hours/lecture
- 2 hours/tutorial

The amount of time students need to allocate to their assignment work and understanding of material will vary from student to student. The university model of a 6 point unit suggests that an average workload would be 12 hours per week including the 4 contact hours of classes, and an additional 8 hours of assigned work and private study.

Unit Relationships

Prohibitions

CPE3007, CPE2008, CSE2208, CSE2391, CSE3001, CSE3208, CSE3391, FIT3041, GCO3813

Prerequisites

One of FIT1001, FIT1031 or CSE1201 or equivalent

Chief Examiner

Professor Bala Srinivasan

Campus Lecturer
Caulfield
Professor Bala Srinivasan

Tutors

Caulfield
Professor Bala Srinivasan
Dr Malik Khan
Mr Guy Kijthaweesinpoon
Academic Overview

Learning Outcomes

At the completion of this unit students will have:

- A knowledge and understanding of:
  - the role of operating systems in the architecture of computer systems;
  - the practical considerations involved in the use of the Unix operating system; specifically memory management, process management and file system implementations;
  - the role, utility and syntax of Unix scripting languages;
  - considerations and techniques for securing the Unix operating system;
  - the responsibilities of and tasks undertaken by Unix system administrators;
  - points of contrast and similarity between Unix and other operating systems in widespread use.

Developed attitudes that enable them to:

- appreciate Unix operating system as it is implemented in modern computer systems - Unix system file system, memory management, and networking, and practical functions;
- know how to solve many systems problems using Unix scripting and system facilities;
- appreciate Unix system programming, research and development, and security.

Developed the skills to:

- use important Unix utilities to monitor Unix systems and Unix networks; construct Unix shell scripts to solve many system problems;
- implement security controls in the Unix environment;
- use Unix utilities for data processing, system development and research;
- install and configure the Unix environment;
- use Unix OS for important network servers and tailor their Unix systems to provide important system and network services.

Demonstrated the communication skills necessary to:

- understand the need to balance requirements of users in multiuser operating system environments;
- confidently discuss issues in groups with regard to the implementation of Unix;
- articulate opinions in group environments with respect to the implementation of operating system environments.
## Unit Schedule

<table>
<thead>
<tr>
<th>Week</th>
<th>Activities</th>
<th>Assessment</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>No formal assessment or activities are undertaken in week 0</td>
<td></td>
</tr>
<tr>
<td>1</td>
<td>Computer systems overview, introduction to Unix and brief history of Unix</td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>Getting a handle on the Unix OS</td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>Shell scripting</td>
<td></td>
</tr>
<tr>
<td>4</td>
<td>Process description and control</td>
<td></td>
</tr>
<tr>
<td>5</td>
<td>Concurrency and Threads</td>
<td></td>
</tr>
<tr>
<td>6</td>
<td>Deadlock and starvation</td>
<td>Assignment 1 due</td>
</tr>
<tr>
<td>7</td>
<td>Memory management</td>
<td></td>
</tr>
<tr>
<td>8</td>
<td>File management</td>
<td>Assignment 2 due</td>
</tr>
<tr>
<td>9</td>
<td>Unix utilities</td>
<td></td>
</tr>
<tr>
<td>10</td>
<td>Unix security</td>
<td>Unit Test in the tutorial class</td>
</tr>
<tr>
<td>11</td>
<td>System administration</td>
<td></td>
</tr>
<tr>
<td>12</td>
<td>Review</td>
<td>Assignment 3 due</td>
</tr>
<tr>
<td></td>
<td>SWOT VAC</td>
<td>No formal assessment is undertaken in SWOT VAC</td>
</tr>
</tbody>
</table>

*Unit Schedule details will be maintained and communicated to you via your learning system.

## Assessment Summary

Examination (2 hours): 60%; In-semester assessment: 40%

<table>
<thead>
<tr>
<th>Assessment Task</th>
<th>Value</th>
<th>Due Date</th>
</tr>
</thead>
<tbody>
<tr>
<td>Assignment 1 - Shell Scripting</td>
<td>10%</td>
<td>Week 6</td>
</tr>
<tr>
<td>Assignment 2 - Concurrent Programming</td>
<td>10%</td>
<td>Week 8</td>
</tr>
<tr>
<td>Unit Test</td>
<td>10%</td>
<td>Week 10 tutorial class</td>
</tr>
<tr>
<td>Assignment 3 - Written Assignment</td>
<td>10%</td>
<td>Week 12</td>
</tr>
<tr>
<td>Examination 1</td>
<td>60%</td>
<td>To be advised</td>
</tr>
</tbody>
</table>
Teaching Approach

Lecture and tutorials or problem classes

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

Assessment Policy

Faculty Policy - Unit Assessment Hurdles

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 1 - Shell Scripting

Description: An individual assessment where students have to develop a working shell script for a practical problem. This is purely a programming exercise. The specification of the assignment will be provided in Week 3.

Weighting: 10%

Criteria for assessment: The program will be assessed on the following:

♦ Functionality;
♦ Efficiency;
♦ Correctness;
♦ Generality of the software;
♦ Error conditions, error trapping and error messages; and
♦ Readability and modularity of the code.

Due date: Week 6

Remarks: Submission of soft copy through file transfer on the unit Moodle web site.

• Assessment task 2

Title: Assignment 2 - Concurrent Programming

Description: An individual assessment where students have to develop a working program for a practical problem using concurrency concepts learned in this unit. This is purely a programming exercise and you are free to choose any programming language for implementation. However, C language will be used for the examples in the labs.

Weighting: 10%

Criteria for assessment: The program will be assessed on the following:
Assessment Requirements

♦ Functionality;
♦ Efficiency;
♦ Correctness;
♦ Error conditions, error trapping and error messages; and
♦ Readability and modularity of the code.

Due date:
Week 8

Remarks:
Submission of soft copy through file transfer on the unit Moodle web site.

• Assessment task 3

Title:
Unit Test

Description:
The unit test will be conducted in the Week 10 tutorial class as a combination multiple choice written test and a scripting exercise. Since it is conducted during the tutorial sessions, each tutorial class will have a different set of multiple choice and scripting questions.

Weighting:
10%

Criteria for assessment:

♦ Correct answers to multiple choice questions (no negative marks for incorrect answers).
♦ The scripting part will be assessed based on the correctness of the script.

Due date:
Week 10 tutorial class

• Assessment task 4

Title:
Assignment 3 - Written Assignment

Description:
A written assignment exploring various principles of operating systems that are covered in the lectures. This assignment is a pre-cursor for the preparation of the final examination.

Weighting:
10%

Criteria for assessment:

♦ Correct answers to the questions.
♦ Explanation or reasoning of behaviours.

Due date:
Week 12

Remarks:
Submission of soft copy through file transfer on the unit Moodle web site.

Examinations
Examination 1

Weighting: 60%
Length: 2 hours
Type (open/closed book): Closed book
Electronic devices allowed in the exam: None

Learning resources

Reading list

Following are the reference books for this unit. A number of web based reference material will be provided on the unit's moodle site.


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
- Interviews
- Test results and feedback
- 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:

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).

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.

Recommended Resources

Access to Linux or Unix off-campus would be useful, but is not required.
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:

- Plagiarism; http://www.policy.monash.edu/policy-bank/academic/education/conduct/plagiarism-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/
- 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

Based on feedback:

- The practical component will be complemented with theoretical questions in the tutorials;
- Supporting theory will be added as part of the lectures; and
- The non-assessable weekly quizzes will continue.

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