Description: Operating Systems

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<th>Subject</th>
<th>Cat-Nbr</th>
<th>Class</th>
<th>Term</th>
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<th>Units</th>
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Academic Group: FOSCI
Academic Org: FOS003
HECS Band: 2
ASCED Code: 020117

STAFFING
Examiner: John Li
Moderator: Richard Watson

PRE-REQUISITES
Pre-requisite: CSC2400 or CSC2401 and ELE1301

RATIONALE
An operating system is the most fundamental software in computer systems. It not only serves as a resource manager for various kinds of resources such as the central processing unit, memory and disks, but also extends the functionality of the bare computer hardware to support application softwares such as compilers, database systems, window systems and networking. This unit covers the design and implementation of all the major components of operating systems. It bridges the knowledge gap between computer architecture and all other software systems and prepares students for the further units on computer systems such as computer networks and distributed systems.

SYNOPSIS
This unit covers the design and implementation of computer operating systems. The major components of operating systems: process management, memory management and file systems are covered in detail. This unit uses NACHOS, an instructional operating system developed at the University of California at Berkeley, as the system for case study, laboratory exercises and programming assignments. Students will have experience of design and implementation of a real operating system and a deep understanding of how operating systems work.

OBJECTIVES
On successful completion of this course students will be able to:
• understand the basic concepts of operating system components: process and thread, synchronization, file system, memory management and system call implementation;
• understand the techniques of implementation of the operating system components described above;
• understand the source code of NACHOS operating system;
• program modules of basic operating system components.

TOPICS

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<tr>
<th>Description</th>
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<tr>
<td>1. Introduction</td>
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<td>2. Computer System Structures</td>
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<td>3. Operating System Structures</td>
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<td>4. Process and Thread</td>
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<td>5. Process Synchronization</td>
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<td>6. Memory Management</td>
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<td>7. Systems Calls Implementation</td>
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<td>8. Virtual Memory</td>
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<td>9. File System Interface</td>
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<td>10. File System Implementation</td>
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TEXT and MATERIALS required to be PURCHASED or ACCESSED:

Books can be ordered by fax or telephone. For costs and further details use the 'Book Search' facility at http://bookshop.usq.edu.au by entering the author or title of the text.

Department of Mathematics and Computing CDROM SET 1, 2003 (available from the USQ Bookshop). This CD set contains course material, Windows and Linux Software relevant to this course offering only. Department of Mathematics and Computing CDROM SET 2, 2003 (available from the USQ Bookshop). This set contains a complete Redhat Linux distribution which is required for this course. For more information about the CD sets and their use, please refer to http://www.sci.usq.edu.au/cdrom.


REFERENCE MATERIALS

Reference materials are materials that, if accessed by students, may improve their knowledge and understanding of the material in the course and enrich their learning experience.

STUDENT WORKLOAD REQUIREMENTS

ACTIVITY: Examinations
HOURS: 3

ACTIVITY: Private Study
HOURS: 166

ASSESSMENT DETAILS

<table>
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<tr>
<th>Description</th>
<th>Marks Out of</th>
<th>Wtg(%)</th>
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<th>Due Date</th>
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<td>ASSIGNMENT 1</td>
<td>15.00</td>
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<td>15 Aug 2003</td>
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<tr>
<td>ASSIGNMENT 2</td>
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<td>ASSIGNMENT 3</td>
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NOTES:
- Examination dates will be available during the Semester. Please refer to the examination timetable when published.

IMPORTANT ASSESSMENT INFORMATION

1 Attendance requirements:
   There are no attendance requirements for this course. However, it is the students' responsibility to study all material provided to them or required to be accessed by them to maximise their chance of meeting the objectives of the course and to be informed of course-related activities and administration.

2 Requirements for students to complete each assessment item satisfactorily:
   To complete each of the assessment items satisfactorily, students must obtain at least 50% of the marks available for each assessment item.

3 Penalties for late submission of required work:
   If students submit assignments after the due date without prior approval then a penalty of 10% of the total marks gained by the student for the assignment will apply for each working day late.

4 Requirements for student to be awarded a passing grade in the course:
   To be assured of receiving a passing grade a student must submit all of the summative assessment items, achieve at least 50% in the examination and at least 50% of the available marks for the summative assessment items.

5 Method used to combine assessment results to attain final grade:
   The final grades for students will be assigned on the basis of the aggregate of the weighted marks obtained for each of the summative assessment items in the course.

6 Examination information:
   In a Closed Examination, candidates are allowed to bring only writing and drawing instruments into the examination.

7 Examination period when Deferred/Supplementary examinations will be held:
Any Deferred or Supplementary examinations for this course will be held during the examination period at the end of the semester of the next offering of this course.

8 University Regulations:
Students should read USQ Regulations 5.1 Definitions, 5.6. Assessment, and 5.10 Academic Misconduct for further information and to avoid actions which might contravene University Regulations. These regulations can be found at the URL http://www.usq.edu.au/SECARIAT/calendar/Part5/ or in the printed version of the current USQ Handbook.

ASSESSMENT NOTES

9 The due date for an assignment is the date by which a student must despatch the assignment to the USQ. The onus is on the student to provide proof of the despatch date, if requested by the Examiner.

10 Students must retain a copy of each item submitted for assessment. This must be produced within five days if required by the Examiner.

11 In accordance with University policy, the Examiner may grant an extension of the due date of an assignment in extenuating circumstances.

OTHER REQUIREMENTS

1 Students will require access to e-mail and internet access to USQConnect and Course home page for this course.

2 Students will be granted a deferred examination only if they perform satisfactorily in all other assessment items.