Description: Advanced Topics in Network Analysis and Design

Subject: CSC  
Cat-nbr: 8407  
Class: 40373  
Term: 1, 2005  
Mode: ONC  
Units: 1.00  
Campus: Toowoomba

Academic group: FOSCI  
Academic org: FOS003  
Student contribution band: 2  
ASCED code: 020199

STAFFING

Examiner: Ron Addie  
Moderator: Karla Ziri-Castro

REQUISITES

Pre-requisite: CSC3407 and CSC3413

RATIONALE

Networks are of increasing importance in commerce, education, and culture and absorb an ever-increasing share of the national budget. The rate of development of new ideas, and their implementation in real networks is higher than in most other fields of industry. Network administrators need to be able to know when to use these new technologies and how to incorporate them in the design of their networks. Examples of new network technology which our students need exposure to include: mobile telephone networks, including CDMA; wireless distribution technology for domestic networks; Assymetric Digital Subscriber Loop (ADSL) systems; personal communication systems; cable systems and broadband networks. This course will deal with these topics, from the point of view of the architecture, the technology choices, design reliability, security, and performance analysis.

SYNOPSIS

The subject of network analysis and design will be reviewed and some aspects of this subject will be dealt with in more depth than students are likely to have met previously. Then the network technologies under consideration will be dealt with one-by-one, from the point of view of the architecture, analysis, and design. This course is normally offered only in odd years.

OBJECTIVES

On successful completion of this course students should be:

1. aware of the range of new communication technologies and designs;
2. able to analyse these technologies and design networks which make use of them;
3. able to analyse the performance of networks including queuing delays, loss, and security and reliability.
TOPICS

<table>
<thead>
<tr>
<th>Description</th>
<th>Weighting (%)</th>
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<tbody>
<tr>
<td>1. Performance Analysis</td>
<td>10.00</td>
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<tr>
<td>2. Analysis of Queueing Delay</td>
<td>10.00</td>
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<td>3. Analysis of Loss</td>
<td>10.00</td>
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<td>4. Security and Reliability</td>
<td>10.00</td>
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<tr>
<td>5. Design Principles</td>
<td>10.00</td>
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<td>6. Cellular mobile telephone networks (GSM, CDMA)</td>
<td>10.00</td>
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<tr>
<td>7. Wireless distribution for local domestic networks</td>
<td>10.00</td>
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<td>8. ADSL</td>
<td>10.00</td>
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<td>9. Personal Communication Systems</td>
<td>10.00</td>
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<td>10. Optical Networks using wavelength division multiplexing</td>
<td>10.00</td>
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</tbody>
</table>

TEXT and MATERIALS required to be PURCHASED or ACCESSED

ALL textbooks and materials are available for purchase from USQ BOOKSHOP (unless otherwise stated). Orders may be placed via secure internet, free fax 1800642453, phone 07 46312742 (within Australia), or mail. Overseas students should fax +61 7 46311743, or phone +61 7 46312742. For costs, further details, and internet ordering, use the 'Textbook Search' facility at http://bookshop.usq.edu.au click 'Semester', then enter your 'Course Code' (no spaces).

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

<table>
<thead>
<tr>
<th>ACTIVITY</th>
<th>HOURS</th>
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<tbody>
<tr>
<td>Laboratory or Practical Classes</td>
<td>60.00</td>
</tr>
<tr>
<td>Lectures</td>
<td>26.00</td>
</tr>
<tr>
<td>Private Study</td>
<td>60.00</td>
</tr>
<tr>
<td>Tutorials</td>
<td>13.00</td>
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</tbody>
</table>
ASSESSMENT DETAILS

<table>
<thead>
<tr>
<th>Description</th>
<th>Marks out of</th>
<th>Wtg(%)</th>
<th>Due date</th>
</tr>
</thead>
<tbody>
<tr>
<td>ASSIGNMENT 1</td>
<td>100.00</td>
<td>20.00</td>
<td>01 Apr 2005</td>
</tr>
<tr>
<td>ASSIGNMENT 2</td>
<td>100.00</td>
<td>20.00</td>
<td>13 May 2005</td>
</tr>
<tr>
<td>ASSIGNMENT 3</td>
<td>100.00</td>
<td>20.00</td>
<td>10 Jun 2005</td>
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</tbody>
</table>
| 3 HR OPEN TAKE HOME EXAM     | 100.00       | 40.00  | 29 Jun 2005  | (see note 1)

NOTES

1. Examination dates will be available during the semester.

IMPORTANT ASSESSMENT INFORMATION

1. Attendance requirements:
   It is the students' responsibility to attend and participate appropriately in all activities (such as lectures, tutorials, laboratories and practical work) scheduled for them, and 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 assignments satisfactorily, students must obtain at least 50% of the marks available for each assignment.

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 achieve at least 50% of the available weighted 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 weighted aggregate of the marks obtained for each of the summative assessment items in the course.

6. Examination information:
   In an Open Examination, candidates may have access to any material during the examination except the following: electronic communication devices, bulky materials, devices requiring mains power and material likely to disturb other students.

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

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/corporateservices/calendar/part5.htm or in 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 may be required to provide a copy of assignment submitted for assessment purposes. Such copies should be despatched to the USQ within 24 hours of receipt of a request to do so.

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

12 Students who have undertaken all of the required assessments in a course but who have failed to meet some of the specified objectives of a course within the normally prescribed time may be awarded the temporary grade: IM (Incomplete - Make up). An IM grade will only be awarded when, in the opinion of the examiner, a student will be able to achieve the remaining objectives of the course after a period of non directed personal study.

13 Students who, for medical, family/personal, or employment-related reasons, are unable to complete an assignment or to sit for an examination at the scheduled time, may apply to defer an assessment in a course. Such a request must be accompanied by appropriate supporting documentation. One of the following temporary grades may be awarded IDS (Incomplete - Deferred Examination: IDM (Incomplete Deferred Make-up); IDB (Incomplete - Both Deferred Examination and Deferred Make-up).