



The University of Southern Queensland

Course specification

The current and official versions of the course specifications are available on the web at
<<http://www.usq.edu.au/coursespecification/current>>.
Please consult the web for updates that may occur during the year.

Description: Network Design and Analysis

| Subject | Cat-nbr | Class | Term | Mode | Units | Campus |
|---------|---------|-------|---------|------|-------|-----------|
| CSC | 3413 | 90220 | 2, 2009 | EXT | 1.00 | Toowoomba |

| | |
|-----------------------------------|--------|
| Academic group: | FOSCI |
| Academic org: | FOS003 |
| Student contribution band: | 2 |
| ASCED code: | 020113 |

STAFFING

Examiner: Ron Addie
Moderator: Yan Li

OTHER REQUISITES

Recommended Pre-requisite: CSC3407 or equivalent.

RATIONALE

One of the main areas of work in the expanding field of Information Technology is network planning and administration. One of the tasks a network administrator must undertake from time to time is the installation or major upgrade of a network. Networks in large and even moderate companies nowadays are likely to span more than one site and to include telephony as well as TCP traffic. Security is also a great concern for network administrators, especially when their traffic is exposed to the internet. This course will provide students with the theoretical and practical knowledge, and the experience, to be able to analyse their networks and to design their new and upgraded networks using the latest technology.

SYNOPSIS

This course will provide the student with the following subjects: queueing theory; performance of communication networks including measurement, modelling and analysis of network performance including reliability, packet loss, throughput and delay, and security; network architecture including layering of networks; network design including dimensioning (deciding how fast/many of the links switches, routers and servers there should be), routing design (where traffic should go), topological design (where to put new links) and security (authentication, VLAN's, firewalls). In addition, students will tackle a series of example problems of network analysis and design of increasing complexity.

OBJECTIVES

On successful completion of this course students will be able to:

1. estimate the performance of a link (Assignment 2 & 5, Exam);

2. measure the traffic levels and the performance on a network (Assignment 3 & 5, Exam);
3. analyse a network from the point of view of delay, congestion and reliability (Assignments 1, 2 & 5, Exam);
4. select an appropriate architecture for a new network (Assignments 3 & 5, Exam);
5. install the necessary routing information in the key routers and switches in a network (Assignments 2 & 5, Exam);
6. select an appropriate architecture for a new network (Assignments 4 & 5, Exam);
7. make sensible choices of hardware, network topology, link capacities and router capacities in a new network (Assignment 5, Exam).

TOPICS

| | Description | Weighting (%) |
|----|----------------------|---------------|
| 1. | Queueing theory | 10.00 |
| 2. | Measurement | 15.00 |
| 3. | Performance Analysis | 20.00 |
| 4. | Network architecture | 10.00 |
| 5. | Network design | 20.00 |
| 6. | Security design | 15.00 |
| 7. | Planning | 10.00 |

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).

Although subject to change, at this stage, it is expected students may require access to Semester 2, Department of Mathematics and Computing DVDROM SET, 2007 (available from the USQ Bookshop). This DVD set contains Semester 2 course material, and Windows software relevant to this course. For more information about the DVD sets and their use, please refer to <http://www.sci.usq.edu.au/dvdrom> and the course web site.

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 | HOURS |
|---------------|--------|
| Assessments | 20.00 |
| Examinations | 2.00 |
| Private Study | 145.00 |

ASSESSMENT DETAILS

| Description | Marks out of | Wtg (%) | Due date |
|-------------------------|--------------|---------|------------------------|
| ASSIGNMENT 1 | 100.00 | 10.00 | 03 Aug 2009 |
| ASSIGNMENT 2 | 100.00 | 10.00 | 17 Aug 2009 |
| ASSIGNMENT 3 | 100.00 | 10.00 | 07 Sep 2009 |
| ASSIGNMENT 4 | 100.00 | 10.00 | 05 Oct 2009 |
| ASSIGNMENT 5 | 100.00 | 10.00 | 19 Oct 2009 |
| 2 HOUR OPEN EXAMINATION | 50.00 | 50.00 | END S2 (see note 1) |

NOTES

1. 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 of the examiner then a penalty of 5% of the total marks gained by the student for the assignment may apply for each working day late up to ten working days at which time a mark of zero may be recorded. No assignments will be accepted after model answers have been posted.
- 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 total weighted marks available for the course.

- 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 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 Students must retain a copy of each item submitted for assessment. If requested, students will be required to provide a copy of assignments submitted for assessment purposes. Such copies should be despatched to USQ within 24 hours of receipt of a request being made.
- 10 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.

OTHER REQUIREMENTS

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