Unit Outline 2012
Faculty of Information Sciences and Engineering

Unit Title: High Speed Networking PG
Unit Number: 6692
This Unit Outline must be read in conjunction with:

a) UC Student Guide to Policies, which sets out University-wide policies and procedures, including information on matters such as plagiarism, grade descriptors, moderation, feedback and deferred exams, and is available at (scroll to bottom of page) http://www.canberra.edu.au/student-services

b) UC Guide to Student Services, and is available at (scroll to bottom of page) http://www.canberra.edu.au/student-services

c) Any additional information specified in section 6h.

1: General Information

1a Unit title
High Speed Networking

1b Unit number
6692

1c Teaching Period and year offered
S1, 2012

1d Credit point value
3CP

1e Unit level
Post Graduate (PG)

1f Name of Unit Convener and contact details (including telephone and email)
Convener: Dr Xu Huang, 6201 2430,
E-Mail: Xu.Huang@canberra.edu.au
Office: 11A17

Name of Unit Moderator: Dr Kim Le
Telephone and email: 6201 2425,
Email: Kim.Le@canberra.edu.au
Office: 11C12.

1g Administrative contact details (including name, location, telephone and email)
The School Office 11B14, Ph: 6201-2417/6201-2153, email: ise@canberra.edu.au
2: Academic Content

2a Unit description and learning outcomes
Unit description: Computer networking is undergoing a fundamental transformation. The use of optical fibre for data transmission has made Gigabit/sec communications networks feasible. This unit studies the technology and software used to implement such high-speed networks. Topics to be covered include: Fibre optic networks (SONET), cell-relay networks (ATM), implementation of high-throughput protocol software, and user applications which depend on high data transfer rates.

Learning outcomes: On completion of the unit, students will have a good appreciation of the building blocks and operation of high speed networking technology including the hardware and software components.

2b Generic skills
Information & Communication Technology: ability to select and use appropriate information and communication technology to retrieve, manipulate and present information. Problem solving, lifelong learning, and personal attributes. There are two experimental works, and more than 40 questions designed for those skills. Also the students will be asked for presenting a formal experiment report based on the experimental works.

2c Prerequisites and/or co-requisites
Computer Structures and Networks (G)

3: Delivery of Unit and Timetable

3a Delivery mode
This subject is delivered on campus with weekly lectures and tutorials/labs, as per UC timetable for the semester.

3b Timetable of activities, such as lectures/ tutorials/ practicals/ field classes, showing key dates and topics (Information might be provided in the form of a table)

<table>
<thead>
<tr>
<th>Week</th>
<th>Activity</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>High Speed Networking Concepts</td>
</tr>
<tr>
<td>2</td>
<td>Network Edge, Throughput, Timing.</td>
</tr>
<tr>
<td>3</td>
<td>Introduction to Transport protocol, DSL, &amp; Cable (Lab)</td>
</tr>
<tr>
<td>4</td>
<td>WiFi and Physical Media (Lab)</td>
</tr>
<tr>
<td>5</td>
<td>Network Core, Delay &amp; Loss (Lab)</td>
</tr>
<tr>
<td>6</td>
<td>Queuing delay &amp; packet Loss (Assignment 1)</td>
</tr>
<tr>
<td>7</td>
<td>Web &amp; HTTP, Message &amp; Cookies (Assignment 2)</td>
</tr>
<tr>
<td>8</td>
<td>class free period</td>
</tr>
<tr>
<td>9</td>
<td>Web Caching (Proxy Server) and P2P (Assignment 3)</td>
</tr>
<tr>
<td>10</td>
<td>Introduction to Transport Layer (Assignment 4)</td>
</tr>
<tr>
<td>11</td>
<td>Connectionless Transport: UDP (Lab)</td>
</tr>
<tr>
<td>12</td>
<td>Flow Control &amp; Connection Management (Assignment 5)</td>
</tr>
<tr>
<td>13</td>
<td>Congestion Control and Network security (I)  (Assignment 6)</td>
</tr>
<tr>
<td>14</td>
<td>Network Security (II) (Prepare for examination)</td>
</tr>
</tbody>
</table>
4: Unit Resources

4a Lists of required texts/readings

Required Texts:
You will require one textbook that serves as a reference for TCP/IP Networking. One of the following books is recommended, although none cover all of the material included in this unit.

*Computer Networking, 5th Edition,*
Kurose and Ross, Addison Wesley 2010.

*Internetworking with TCP/IP Volume 1, 5th Edition,*

Supplementary readings:


*Network System Design using Network Processors (Intel 2xxx Version)*

Online materials:
Lecture materials, tutorial questions and answers, assignment specifications, and other details are available on the subject web site.

4b Materials and equipment

While the computers and software in the Building 11 Student Laboratories may be used in this unit, it is strongly recommended that you use your own personal computers and the supplied open source software for assignment work.
If you own only one PC, then please liaise with other students in order to test your assignment submissions.

4c Unit website

5: Assessment

5a Assessment overview

<table>
<thead>
<tr>
<th>Assessment item (including exams held in the exam period)</th>
<th>Due date of assignments</th>
<th>Weighting (total to equal 100%)</th>
<th>Addresses learning outcome(s)</th>
<th>Addresses generic skill(s)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Assignment</td>
<td>At the tutorial classes, as shown in the unit outline, one of assignment questions will be picked as the “class test,” the final “assignment mark” will be the average the “class tests.”</td>
<td>25%</td>
<td>Understanding the basic concepts of the networks. Increasing the skills for “the problem solving.”</td>
<td>Skills 3 (ICT), 4 (problem solving) and 7 (lifelong learning)</td>
</tr>
<tr>
<td>Experimental Report (together with your experimental log-book for all lab works)</td>
<td>5:00pm, Friday of Week 13</td>
<td>25%</td>
<td>Learning the concepts in real life by hands on</td>
<td>Skills 3 (ICT), 4 (Problem solving), 5 (working with others) and 8 (Personal Attributes)</td>
</tr>
<tr>
<td>Examination</td>
<td>University examination period</td>
<td>50%</td>
<td>Understanding the concepts and increasing the skills for the problem solving</td>
<td>Skills 1 (Communication), 3 (ICT), 4 (Problem Solving), and 7 (lifelong learning)</td>
</tr>
</tbody>
</table>

5b Details of each assessment item

**Assignment:**
Network assignments will be distributed after lecture classes (or downloaded from the website). At a tutorial class, one question of assignment questions will be picked as the “class test” and the final “assignment mark” will be the average of all the “class tests.”

**Experimental Reports:**

There are two experimental works as shown below. All the experimental works must be done that are evidenced by your Lab Log-book. The final report will be based on one of your experimental works

**Final Examination:**
Closed book, one A4 page hand writing notes is permitted.

Full details of assessment are available on the unit web site (see 4c).

5c Special assessment requirements
The final assessment in the subject will result in one of the following grades: HD, DI, CR, P or Fail. Please note that PX grades are no longer available at UC.

Total mark = assignment mark (25%) + experimental report mark (25%) + examination mark (50%)

The grade for the subject is then determined according to the following rules:

<table>
<thead>
<tr>
<th>Total mark (out of 100)</th>
<th>Exam mark (out of 60)</th>
<th>Final Grade</th>
</tr>
</thead>
<tbody>
<tr>
<td>≥ 85 and ≥ 51</td>
<td>HD</td>
<td></td>
</tr>
<tr>
<td>≥ 75 and ≥ 45</td>
<td>DI</td>
<td></td>
</tr>
<tr>
<td>≥ 65 and ≥ 39</td>
<td>CR</td>
<td></td>
</tr>
<tr>
<td>≥ 50 and ≥ 30</td>
<td>P</td>
<td></td>
</tr>
<tr>
<td>&lt; 50 or &lt; 30</td>
<td>(NX, NS, NC or NN)</td>
<td></td>
</tr>
</tbody>
</table>

5d Supplementary assessment

There will be no supplementary test or exam. Students who miss the final exam due to illness must provide a doctor's certificate, stating that the student was not able to sit for the exam, to the lecturer in charge as soon as possible - generally within 3 days of the examination.

5e Academic Integrity

Students have a responsibility to uphold University standards on ethical scholarship. Good scholarship involves building on the work of others and use of others’ work must be acknowledged with proper attribution made. Cheating, plagiarism, and falsification of data are dishonest practices which contravene academic values.

5f Text-matching software

No text-matching software will be used in this Unit.

6: Student Responsibility

6a Workload

The amount of time you will need to spend on study in this unit will depend on a number of factors including your prior knowledge, learning skill level and learning style. Nevertheless, in planning your time commitments you should note that for a 3cp unit the total notional workload over the semester or term is assumed to be 150 hours. These hours include time spent in classes. The total workload for units of different credit point value should vary proportionally. For example, for a 6cp unit the total notional workload over a semester or term is assumed to be 300 hours.

6b Special needs
Students who need assistance in undertaking the unit because of disability or other circumstances should inform their Unit Convener or UC Access Ability (formerly the Disabilities Office) as soon as possible so the necessary arrangements can be made.

6c Attendance requirements
Lecture attendance records will be kept. Students who do not attend regularly will almost certainly fail the final exam.

6d Withdrawal
If you are planning to withdraw please discuss with your unit convener. Please see this link for further information on deadlines.

6e Required IT skills
See Section 2b

6f Costs
Textbooks, software and consumables.

6g Work Integrated Learning
NA

6h Additional information

7: Student Feedback

All students enrolled in this unit will have an opportunity to provide anonymous feedback on the unit at the end of the Semester via the Unit Satisfaction Survey (USS) which will be presented to you on OSIS. Your lecturer or tutor may also invite you to provide more detailed feedback on their teaching through an anonymous in-class questionnaire administered through the University’s Teaching and Learning Centre (TLC).

8: Authority of this Unit Outline

Any change to the information contained in Section 2 (Academic content), and Section 5 (Assessment) of this document, will only be made by the Unit Convener if the written agreement of Head of Discipline and a majority of students has been obtained; and if written advice of the change is then provided on the unit site in the learning management system. If this is not possible, written advice of the change must be then forwarded to each student enrolled in the unit at their registered term address. Any individual student who believes him/herself to be disadvantaged by a change is encouraged to discuss the matter with the Unit Convener.