**ECE4414/ECE5414 Performance of Telecommunication Networks**

**Unit details Second Semester 2006**

**Unit leader:**
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**Other lecturers:** nil

**Credit points:** 4(ECE4414), 6(ECE5414)  **Prerequisite:** ECE2401  **Corequisite:** nil

**Time allocation:**
Lectures: 2 hours per week, Laboratories 12 x 2 hours
Students must expect to spend a minimum of 1 hour of private study for each hour of class time.

**Synopsis:**
*Fundamentals of packet and circuit switching, the telephone network and the Internet:*

**Assessment:**
ECE4414: Assignment 1 5%, Assignment 2 25%, 3 hour examination 70%
ECE5414: Assignment 1 5%, Assignment 2 15%, Assignment 3 10%, 3 hour examination 70%

Assignment due dates and times are posted on the Unit Web site.

All laboratory classes are compulsory even for repeating students and failure to attend will be grounds for exclusion from the final examination.

Students must ensure that they have received all necessary safety instructions before commencing each experiment. See also Appendix C in the Department's *Undergraduate Handbook 2006.*

Assignments will be done individually; jointly prepared works will **not** be accepted.

A student must score at least 45% in both components (lab/assignments and exam) and achieve a cumulative score of at least 50% to be awarded a pass in this unit. If a score of less than 45% is achieved in either component then 44% is the highest mark that will be awarded for the unit, which is a fail.
References:
Other references: Kurose, F. and Ross, K., *Computer Networking: A Top-Down Approach Featuring the Internet*, Addison-Wesley, 2005. (Chapter 3 is available on-line through the Monash University Library Web site)

Tentative unit outline:

<table>
<thead>
<tr>
<th>Week</th>
<th>Lectures</th>
<th>Reading</th>
<th>Laboratories</th>
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</thead>
<tbody>
<tr>
<td>1</td>
<td>Fundamentals of packet and circuit switching techniques</td>
<td>[stallings2002] Ch 1-3</td>
<td>No labs</td>
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<tr>
<td>2</td>
<td>An overview of modern network architectures</td>
<td>[stallings2002] Ch 4</td>
<td>Experiment 1</td>
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<td></td>
<td>[kumar2004] Ch 2 (skip Sec 2.3.6)</td>
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<td>3</td>
<td>Packet switched networks: Modeling, performance estimation and analysis</td>
<td>[kleinrock93]</td>
<td>Experiment 2</td>
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<tr>
<td>4</td>
<td>Queueing theory concepts for delay and loss analysis in telecommunication networks</td>
<td>[stallings2002] Ch 7 and 8</td>
<td>Experiment 3</td>
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<td></td>
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<td>[schwartz88] Ch 2</td>
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<td>5</td>
<td>Network traffic management: Routing algorithms and protocols, QoS provision, multimedia network design</td>
<td>[stallings2002] Ch 14-17 (skip Sec 16.2)</td>
<td>Experiment 4 (cont.)</td>
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<tr>
<td>6</td>
<td>End-system traffic management: Congestion control in data networks, flow and error control in link and transport layers. TCP congestion and flow control algorithms</td>
<td>[stallings2002] Ch 10-12 (skip Sec 10.5)</td>
<td>Experiment 6 (cont.)</td>
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<td>7</td>
<td>Review of the semester</td>
<td>As above</td>
<td>Experiment 7 (cont.)</td>
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Other important details: All assignments to be submitted on-line through the Web based assignment submission system. No printouts or floppy disks will be collected. Late submission penalties apply. Please refer to the unit Web site for details.