Carleton University

Department of Systems and Computer Engineering

SYSC5201 Introduction to Computer Communications Fall 2011

Course Outline

Instructor:
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Course Web Page: You may check the course web page at http://www.sce.carleton.ca/courses/index.shtml

Please allow some time till the web page is up and running! Use the following login information:
Login: sysc-5201, **password**: iel2011

Course Objectives:
To provide an introduction to telecommunication networks and computer communications. Emphasis will be given on principles of operation and advanced issues related to performance analysis. Some emerging technologies will be introduced and discussed time permitting.

Lectures: Monday-Wednesday, 6:00pm - 7:30pm , Patterson Hall 236

Office Hours: Monday-Wednesday, 5:00 pm – 6:00pm

Textbooks:
1. Fundamentals of Telecommunication Networks, T.N. Saadawi, M.H. Ammar with A. El Hakeem, John Wiley, 1994
2. High Performance Communication Networks, Jean Walrand and Pravin Varaya, Morgan Kaufmann, 1996

(Highly) Recommended Reference:
1. Communication networks : Fundamental concepts and key architectures, A. Leon-Garcia and Indra Wadjaja, Mc-Graw Hill 2004, TK5101 .L46 2004

Additioanal References:
1. Computer Networking: A Top-Down Approach Featuring the Internet, K. Ross and J. Kurose, Addison Wesley 2001
2. Communication Networks: A First Course, J. Walrand, Second Edition, McGraw-Hill, 1998, ISBN: 0-256-17404-0
3. Computer Communications and Networking technologies, M.A. Gallo, W. M. Hancock, Brookes/Cole, ISBN: 0-534-37780-7
4. Communication Networks: A First Course, J. Walrand, Irwin, 1991, TK5105.5.W35.
5. Data Networks, D. Bertsekas and R. Gallager, 2nd edition, Prentice-Hall, 1992, TK5105.B478 1992.
6. Data and Computer Communications, W. Stallings, 5th edition, Prentice-Hall, 1997, TK5105.S73 1996.

7. Computer Networks, A. S. Tanenbaum, 3rd edition, Prentice-Hall, 1996, TK5105.5.T36 1996.
8. High-Speed Networks: TCP/IP and ATM Design Principles, W. Stallings, Prentice-Hall, 1998, TK5105.585.S73.
9. An Engineering Approach to Computer Networking: ATM Networks, the Internet, and the Telephone Network, S. Keshav, Addison-Wesley, 1997, ISBN #0-201-63442-2.
10. Broadband Integrated Networks, M. Schwartz, Prentice-Hall, 1996, TK5103.75.S38.
11. Computer Networks and Internets, D. E. Comer, Prentice-Hall, 1997, TK5105.5.C5897.

12. Networking Standards, W. Stallings, Addison Wesley, 1993, TK5105.5.S788.
13. Probability and Random Processes for Electrical Engineering, A. Leon-Garcia, Addison Wesley, 1989, TK153.L425
14. Queueing Systems, L. Kleinrock, vol. 1, John Wiley, 1975, T57.9.K6.

Prerequisites:
Undergraduate preparation in probability theory, elementary stochastic processes and statistics.

Exams, Assignments and Marking:
We will have three exams for this course. The contribution towards the final grade and the dates of the exams are as follows:

First Exam 20% (Monday Oct. 3rd, 30-45 minute exam in the form of a quiz)
Second Exam 40% (Monday Oct. 31st, during normal class hours)
Third Exam 40% (Monday Dec. 5th , **last day of classes**, during normal class hours)

3-4 assignments that will not be graded with solutions will be provided over the web.

- PLEASE check the web regularly!!!!!!
- The purpose of assignments is to help you learn the material and prepare for examinations. It is essential that you fully understand all the assignments. If you perform badly on some questions, ensure that you find out afterwards what you should have done.

Week by week outline:
Week #

1. Introduction to communication networks.
2. Overview of traditional and broadband networks.
3. Layered protocol architectures and related issues.
4. Queuing theory primer and math review.
5. Data Link protocols
6. Data Link Protocols (cont.) / Multiple Access techniques

7. Multiple access techniques and networks (IEEE 802.x standards).
8. Network Layer: Routing and Routing Algorithms
9. Network Layer: Naming and addressing techniques.
10. Transport Layer: Scheduling/Congestion and flow control.
11. Transport Layer: An Introduction to TCP
12. Special topics: Quality of service for broadband networks
13. Special topics: Introduction to optical networks (time permitting)

Students with Disabilities:

Students with disabilities requiring academic accommodations in this course must register with the Paul Menton Centre for Students with Disabilities for a formal evaluation of disability-related needs. Registered PMC students are required to contact the Centre, 613-520-6608, every term to ensure that I receive your Letter of Accommodation, no later than two weeks before the first assignment is due or the first in-class test/midterm requiring accommodations. If you require accommodation for your formally scheduled exam(s) in this course, please submit your request for accommodation to PMC by November 11th 2011 for Fall term (December exams).

Plagiarism:

Plagiarism (copying and handing in for credit someone else's work) is a serious instructional offense that will not be tolerated. Please refer to the section on instructional offenses in the Undergraduate Calendar for additional information.

Health and Safety:

Every student should have a copy of our Health and Safety Manual. An electronic version of the manual can be found at http://www.sce.carleton.ca/courses/health-and-safety.pdf