CS 453: Data and Computer Communications

Spring 2007 ,T R, 8:00-9:15am, 107 MRB-E, CRN 15126

Computer networking is a field that has huge impact on almost all aspects of software development. This course examines both the theory and practice of modern computer networks and the Internet. Emphasis will be on the software aspects of networking (protocols, applications, and services). Topics covered will be the architecture of the Internet, the software systems that run it, and the theory and practice of current protocols such as TCP/UDP/IP, ICMP, HTTP, NNTP, etc. Time permitting, other, more advanced, issues will be discussed, such as high performance architectures, security/authentication, distributed objects (CORBA, DCOM, etc.), or others suggested by the students.

Administrivia

Prerequisites:	CS 350 (or extremely capable with Java or C)
Instructor:	Todd L. Montgomery 537 ESB
Office Hours:	Tues 9:15-10:30am, Thurs 9:15-10:30am (or by appointment)
Contact Information:	tmont@csee.wvu.edu http://www.csee.wvu.edu/~tmont
Course Information:	http://www.csee.wvu.edu/~tmont/cs453.html

Topics

The topics covered in the class will be based on current technologies used daily in the Internet. These technologies will be used to demonstrate basic computer networking principles, ideas, and concepts. The topics we hope to cover are:

Introduction to Networking Principles
The BSD Sockets API and Java's Network API
Internetworking and the Internet (Concepts, Architecture, Addressing, etc.)
Application Protocols (HTTP, DNS, NNTP, Telnet/Rlogin, DNS, etc.)
Network and Transport Protocols (IP, UDP, TCP, ICMP, Routing, etc.)
Data Link Protocols (Ethernet, IEEE 802.x, PPP, ATM, etc.)
Advanced Topics (Network Security, etc.)

Dates

Jan. 9	First Day of Class
Feb. 16 (Friday)	Assignment Set 1 Due
Feb. 22	Midterm Exam
Mar. 9 (Friday)	Assignment Set 2 Due
Mar. 24 – Apr. 1	Spring Break
Apr. 27 (Friday)	Assignment Set 3 Due
Apr. 30 (Monday)	Final Exam (3-5pm)

Supplemental Texts

The class does not have any specific text. Instead, the topics will be taken from a number of sources. For those interested, *most* of the material will come from the following references.

- D.E. Comer, *Internetworking with TCP/IP, Volume 1*, Prentice Hall, Englewood Cliffs, NJ, 1991 (2nd edition), ISBN 0-13-468505-9
- W.R. Stevens, *TCP/IP Illustrated, Volume 1*, Addison-Wesley, Reading, Massachusetts, 1994, ISBN 0-201-63346-9
- R. Perlman, *Interconnections: Bridges and Routers*, Addison-Wesley, Reading, Massachusetts, 1992, ISBN 0-201-56332-0
- W. Stallings, *Data and Computer Communications*, Prentice Hall, Upper Saddle River, NJ, 1997 (5th edition), ISBN 0-02-415425-3
- B. A. Forouzan, *TCP/IP Protocol Suite*, McGraw Hill, 2003 (2nd Edition), ISBN 0-07-246060-1
- C. M. Kozierok, *The TCP/IP Guide*, No Starch Press, 2005, ISBN 1-59327-047-X.

Computer Accounts

You will be assigned a student programming account if you do not have one.

Grading

All graded material must be done individually and in accordance with the University regulations on academic dishonesty and student code of conduct. Grades will be based on 3 multi-part assignments (50%), a midterm (25%), and a final (25%). There will be no makeup examinations. If you provide a valid, written medical excuse, your grade will be averaged based on your other material. Programming assignments can be done in a choice of languages (C, C++, Java, etc.), but some restrictions may apply to certain assignments. All assignments will be submitted electronically to the instructor unless otherwise stated in class or by email. Late assignments will not be accepted. Extra credit may be available. Grades will be awarded based on the following scale: 90-100 (A), 80-89 (B), 70-79 (C), 60-69 (D), less than 60 (F). You are responsible for all material presented in class, presented on the course web page and on the class mailing list if used.