

Principles of Computer Networking (Fall, 2004)

CRN	10435
Course Number	ECE-C631
Section Number	501
Credits	3.0
Time	Thursdays 6pm - 8:50pm
Room	Curtis 451
Instructor	Steven Weber
Restrictions	graduate standing
Department	Electrical and Computer Engineering

Description

Principles of circuit switching, packet switching and virtual circuits; protocol layering; application layer protocols for e-mail and web applications; naming and addressing; flow control and congestion avoidance with TCP; Internet Protocol (IP); routing algorithms; router architectures; multicast protocols; local area network technologies and protocols; issues in multimedia transmissions; scheduling and policing; Quality-of-Service and emerging Internet service architectures; principles of cryptography.

Textbook

Primary text (required)

Title	Communication Networking : An Analytical Approach
Authors	Anurag Kumar, D. Janjunath, and Joy Kuri
Publisher	Morgan Kaufmann
ISBN	0124287514
Edition	1 st

Supplemental text (optional)

Title	Computer Networking: A Top-Down Approach Featuring the Internet
Authors	James Kurose and Keith Ross
Publisher	Pearson Addison Wesley
ISBN	0201976994
Edition	2 nd

Supplemental text (optional)

Title	Probability and Random Processes for Electrical Engineering
Authors	Albert Leon-Garcia
Publisher	Prentice-Hall
ISBN	020150037X
Edition	2 nd

A couple of comments on the textbooks:

- The Kumar text will be used for ECE-C631 (Fall) and ECE-C632 (Winter).
- The Leon-Garcia text is OPTIONAL. You will need to know probability for this course, and Leon-Garcia is simply a textbook that I like as a reference. If you are using the Papoulis text for the ECE stochastics sequence then that will serve just as well.
- The Kurose and Ross text was the primary textbook in last year's course. It is a great book for learning the Internet protocols, not so good for learning network analysis. The Kurose text is OPTIONAL, I will provide all necessary background on protocols not available in the Kumar text. If you have a friend who took the course last year, however, you may want to borrow it to have as a handy reference.

Grading

Homework (one problem set per week)	30%
Midterm Exam (comprehensive)	30%
Final Exam (comprehensive)	40%

Homework and Makeup Exams

Makeup exams are only available if you are unable to attend due to a severe health problem or a death in your family. Homeworks are due at the **beginning** of class, one week following the class in which they were assigned. Late homeworks will not be accepted.

Students with Disabilities

In accordance with Drexel University policy, any student with a documented disability who needs accommodations is encouraged to contact the Office of Disability Services (215-895-1401) or speak directly to the professor for further information about this office. Students must register with the Office of Disability Services and receive an Accommodation Verification Form prior to receiving accommodations. Contact with the Office of Disability Services is strictly confidential. Please make contact as early in the term as possible in order to receive timely accommodations.

Mandatory Registration

All students sitting in the classroom during the class **must** be registered for the course and on the class list supplied to the instructor for the second class. Any student not on the list at that time will be asked to leave until proper registration is obtained.

Academic Dishonesty

The Drexel University policy on academic dishonesty may be found at <http://www.drexel.edu/studentlife/studenthandbook2002/judicial/acadhon.html> and will be strictly enforced. **Plagiarism, fabrication, and cheating will, at the discretion of the instructor, constitute grounds for failure of the course.**

Course CalendarPlease read the assigned materials for the lecture *before* the class in which it is covered.

Class	Date	Material	Homework
1	9/30	★ Chapter 2: <i>Networking: functional elements and current practice</i> ★ Scott Shenker, “Fundamental design issues for the future Internet”, <i>IEEE Journal on Selected Areas in Communications (JSAC)</i> , Vol. 13, No. 7, September, 1995, pp. 1176–1188.	★ HW1 assigned
2	10/7	★ Chapter 3: <i>Multiplexing: performance measures and engineering issues</i> ★ J. H. Saltzer, D. P. Reed, D. D. Clark, “End-to-end arguments in system design”, <i>ACM Transactions on Computer Systems (TOCS)</i> , Vol. 2, No. 4, November, 1984, pp. 277-288.	★ HW1 due ★ HW2 assigned
3	10/14	★ Chapter 7: <i>Adaptive bandwidth sharing for elastic traffic (§7.1-7.5)</i> ★ R. Jain, “Myths about Congestion Management in High Speed Networks”, <i>Internetworking: Research and Experience</i> , Vol. 3, 1992, pp. 101-113.	★ HW2 due ★ HW3 assigned
4	10/21	★ Chapter 7: <i>Adaptive bandwidth sharing for elastic traffic (§7.6-7.8)</i> ★ Sally Floyd and Kevin Fall, “Promoting the use of end-to-end congestion control in the Internet”, <i>IEEE/ACM Transactions on Networking (ToN)</i> , Vol. 7, No. 4, August, 1999, pp. 458-472.	★ HW3 due
5	10/28	Midterm Exam	★ HW4 assigned
6	11/4	★ Chapter 9: <i>Performance and architectural issues</i> ★ Chapter 10: <i>Queueing in packet switches</i>	★ HW4 due ★ HW5 assigned
7	11/11	★ Chapter 11: <i>Switching fabrics</i> ★ Chapter 12: <i>Packet processing</i>	★ HW5 due ★ HW6 assigned
8	11/18	★ Chapter 13: <i>Routing: engineering issues</i> ★ Chapter 14: <i>Routing: Shortest path routing of elastic aggregates</i>	★ HW6 due ★ HW7 assigned
	11/25	Thanksgiving Holiday (no class)	
9	12/2	★ Chapter 15: <i>Virtual path routing of elastic aggregates</i> ★ Chapter 16: <i>Routing of stream-type sessions</i>	★ HW7 due ★ HW8 assigned
10	12/9	★ J. K. MacKie-Mason and H. R. Varian, “Pricing congestible network resources”, <i>IEEE Journal on Selected Areas in Communications (JSAC)</i> , Vol. 13, No. 7, September, 1995, pp. 1141-1149.	★ HW8 due
11	12/16	Final Exam	