TEMPLE UNIVERSITY
DEPARTMENT OF ELECTRICAL & COMPUTER ENGINEERING

EE 5516 INTRO COMMUNICATION NETWORKS (3 SH)

PREREQUSITIES BY TOPIC:

Analog and Digital Communications
Introductory knowledge of probability theory

Course Description:

Introduction to communication networks, telephone networks, Internet, LANs, Wireless networks, and other related topics. The course will include some programming projects. The main requirement for students taking this course is introductory knowledge of probability theory and C programming.

Textbooks:

Larry l. Patterson and Bruce S. Davie, "Computer Networks " A system Approach 4th Edition 2007, Morgan Kaufmann.

Reference books:

J.E. Kurose and K.W. Ross, Computer Networking: A Top-Down Approach Featuring the Internet, Addison-Wesley, 4th Edition 2008.

GOALS:

The course will introduce students to communication networks. At the end of the course the student should understand the following concepts:

Communications networks technologies
Limitations of communications channels
Network architectures and network protocols at different levels
An overview of common networking standards

Projects and homework:
Programming projects using high level programming languages and OPNET will be assigned.

Grading Policy:

Homework - 20%
Projects - 20 %
Midterm Exam - 30 %
Final Exam - 30 %

Schedule

Week		Topic Reading
1 - 2	Network Services and Applications (DNS, FTP, SCP, e-mail, ...)	Sections 1.1-1.3, pp. 2-18
	Internet Architecture, Layering, OSI Model, End-to-end Arguments	Sections 1.3, pp. 19-29
3 - 4	Data Link Layer - Overview	Sections 2.1,pp. 1-75,
	Coding Error Detection and Correction Concepts, Coding	Sections 2.2-2.5, pp. 76-88
	Ethernet 802.3 and 802.11e	Sections 2.6, 2.8 pp. 101-120, pp. 131-137
5	Switch and Router Architecture	Sections 2.9, 3.1-3.2, 3.4, pp. 137-146, 164-192, 210-220
	Review	
6	IPV4, Routing IPV6-Distance Vector,	Sections 4.1-4.3, pp. 234-331
7	MIDTERM	
8	UDP and TCP	Sections 5.1, 5.2, pp. 374-405
9	Router Support for Congestion Control	Sections 6.1- 6.4 450-492
10	Network Security	Section 8.1-8.5, pp. 578-622
11-12	Introduction to Network Processors Intel IXP2XXX and Agere APP550	
13	Review and Project Presentation	
14	FINAL	

Periodicals [Available online through Temple computers]

IEEE Communication Magazine
IEEE Network Magazine
IEEE Internet Computing
IEEE Transactions on Communications
IEEE/ACM Transactions on Networks

Term Projects

The topic for your project should relate to communication networks in some way. Common choices are to focus on one technology or one type of telecommunications service that you are interested in investigating. Try to include modeling, performance analysis and simulation. A possible approach is to relate the requirements of the telecommunications service to the types of networking topics in the course. Your report and/or presentation should compare and contrast the approaches taken by your information sources to a similar problem or set of services. You will be graded primarily on your demonstrated ability to coordinate and synthesize the material.