

ENG EC441 Introduction to Computer Networking

2008-2009 Catalog Data:

Computer networks, focusing on the Internet. Application protocols (Web, e-mail), basics of socket programming, major Internet protocols (TCP and IP), fundamental aspects of routing and reliable data transfer over networks, medium access protocols, wired and wireless Local Area Networks (LANs) technologies. Hands-on laboratory modules on client-server programming, Internet experiments, and protocol implementation.

Status in the Curriculum: Elective

Class/Lab Schedule:

Lecture/lab: 4 hours/week

Textbooks and other required materials:

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

Coordinator: David Starobinski, ECE

Prerequisites by topic:

ENG EC 381 and ENG EC 401.

Goals: To provide students with:

1. Understanding of
 - How networks work
 - How well they work
 - Why they work
 - Why they sometimes fail
2. Knowledge of state-of-the-art networking technologies (including the Internet, TCP/IP, Ethernet, and Wireless LANs)
3. Theoretical and practical tools for the analysis and design of modern networks
4. Hands-on learning opportunities through computer-based experiments and small-scale independent studies
5. Opportunities for the development of communication skills through class presentations and design of web sites.

Course Outcomes:

As an outcome of completing this course, students should be able to:

1. Understand fundamental concepts of networking, including packet and circuit switching, statistical multiplexing, network protocols and network layers.
2. Understand the principles of reliable transmission over a communication link
3. Understand the principles of multiple access to a shared communication link
4. Understand how routing protocols work

5. Understand the fundamental design principles of the Internet
6. Understand the concept of end-to-end reliable and unreliable protocols (TCP and UDP)
7. Understand simple application-layers protocols, such as HTTP
8. Design a simple Web server
9. Use a simulator to test a simple network
10. Test and compare ARQ protocols for reliable communication
11. Test and compare routing protocols
12. Perform simple measurements over the Internet
13. Collaborate with a peer student in laboratory/programming assignments.

Course Outcomes mapped to Program Outcomes:

Program Outcomes	A	B	C	D	E	F	G	H	I	J	K
Course Outcomes	1-7	9, 10- 12	8	13	8,10, 11					5	8,9
Emphasis (1-5)	4	3	3	2	3					2	3

Topics in Project Assignments:

1) Network foundations. 2) Application-layer protocols. 3) Socket programming. 4) Reliable transmission & ARQ. 5) Transport protocols. 6) Internetworking and routing protocols. 7) Mac protocols. 8) Ethernet and WLAN. 9) Advanced topics and review.

Contribution of Course to Meeting the Professional Component:

Engineering topics: 100%

Prepared by: David Starobinski

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