Introduction to Communications and Networking

EECS X490 (3)
Spring 2013

Instructor Information

About instructor:
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Prerequisites — Classes or Knowledge Required for this Course

Basic understanding of mathematics and computers.

Course Description

This is a required course in the Certificate Program in Communications and Networking Engineering.

Expand your knowledge of basic principles of data communications. This course provides a comprehensive overview of analog and digital transmission, voice, video and data processing, open systems interconnect (OSI) model, client-server architectures, local area and wide area networks, and modern state of the art technologies. An introduction to Ethernet, TCP/IP, other high speed protocols, broadband communications, and wireless communications are also presented. Participants actively learn through case studies which provide “real-world” scenarios of modern data communication systems.

Learning Objectives

At the end of this course, participants will be able to accomplish the following:
1. Understand the fundamental concepts of data communications and networking.
2. Compare the different technologies used in data communications and networking.
3. Understand the different basic network models used to describe and analyze data communications networks.
4. Be familiar with the overall process of designing and implementing a data communications network.

Methodology

Although Lecture material, Course notes and Slides are available on the course website and the course is self-contained on the Web, it is recommended to read each chapter after the class session. However, much of the material is reinforced by reading the relevant sections of text books and related course material.

Course Textbook/s

Required: Business Data Communications and Networking, 11th Edition; Jerry Fitzgerald, August 2011 Wiley Publishing; ISBN 978-1-1180-8683-4 ©2012

Web site for the textbook can be found at:
http://www.wiley.com/WileyCDA/WileyTitle/productCd-EHEP002045.html

For viewing the slides from the textbook and other class material you will need either Microsoft powerpoint application or a powerpoint viewer. A free powerpoint viewer can be downloaded from:
http://office.microsoft.com/en-us/downloads/CD010798701033.aspx

Reference: Computer Networks, Fourth Edition; Andrew S. Tanenbaum, Prentice Hall – This book provides further details in networking and communication theory.

Evaluation and Grading

Evaluation of Student Performance

Participation on Discussion & Homework & Assignments	20%
Final take home exam	30%
Network Design lab	25%
Next Day Air Service case study	25%

Grading Scale

P Pass
I Incomplete
U Unsatisfactory

Letter grades:

A = 93% – 100%
A- = 90% – 92%
B+ = 87% – 89%
B = 83% – 86%
B- = 80% – 82%
C+ = 77% – 79%
C = 73% – 76%
C- = 70% – 72%
D+ = 67% – 69%
D = 63% – 66%
D- = 60% – 62%
F = 59% or less

Course Policies

- Active Participation in Discussion Forums; provide active learning environment
- Readings Review; ensure understanding of course material
- Homework and Assignments; provide instructor feedback in learning effectiveness

Lectures, Assignments and Exams:

You are expected to attend every class. You are responsible to attend classes, complete assignments, exams and any lab work (in class assignments); respond to quizzes and participate in classroom discussions.

Please email assignments to instructor prior to your next class.

The final exam will be take home and will also be a learning experience.

Feedback and communication with the instructor are welcome whether in-class, phone conversation, or emails.

Code of Conduct

All participants in the course are bound by the University of California Code of Conduct, found at http://www.ucop.edu/ucophome/coordrev/ucpolicies/aos/uc100.html.

Course Policies

Expectations for the Students

Homework Assignment

- Must be completed and emailed to instructor prior to next session.

Class Home Page: *online UCI extension website*

Academic Dishonesty:

Academic honesty is fundamental to the activities and principles of a university. All members of the academic community must be confident that each person's work has been responsibly and honorably acquired, developed, and presented. Any effort to gain an advantage not given to all students is dishonest whether or not the effort is successful. The academic community regards academic dishonesty as an extremely serious matter, with serious consequences that range from probation to expulsion. When in doubt about plagiarism, paraphrasing, quoting, or collaboration, consult the course instructor.

ADA Statement:

If you need assistance or accommodations due to a disability, please notify the instructor immediately. Reasonable effort will be made to accommodate your special needs.

Course Outline

Week 1	
Reading	Text Book Chapter 1 – Introduction to Data Communications;
Topics Covered	➢ Introduction to Data Communications ➢ Network Design Project Overview ➢ Network Design (part 1)
LAB	➢ Hands-on project
Assignments	-
Week 1 – part 2	Text Book Chapter 2 – Application Layer
Assignment	Ch2:Mini Case I & II
Project	Next Day Air Service case study

Week 2 – part 1	
Reading	Text Book Chapter 11 – Network Design
Topics Covered	➢ Network Design ➢ Application Layer
Assignments	Ch11: Mini Case IV
Week 2 – part 2	
Reading for Today	Text Book Chapter 3 – Physical Layer
Topics Covered	➢ Physical Layer
LAB	➢ Hands-on project
Assignments	Ch3: Mini Case IV ;
Project	Next Day Air Service case study

Week 3	
Reading for Today	Text Book Chapter 4 – Data Link Layer
Topics Covered	➢ Physical Layer – Numerical Exercises ➢ Data Link Layer
LAB	➢ Hands-on project
Assignments	Ch4: Mini Case IV
Project	Next Day Air Service case study

Week 4	
Reading for Today	Text Book Chapter 5 – Network and Transport Layers
Topics Covered	➢ Network and Transport Layers
LAB	➢ Hands-on project
Assignments	Ch5: Mini Case II
Project	Next Day Air Service case study

Week 5	
Reading for Today	Text Book Chapter 6 – Local Area and Wireless Networks
Topics Covered	➢ Local Area and Wireless Networks
LAB	➢ **Hands-on project**
Assignments	Ch 6 Mini Case study I
Project	Next Day Air Delivery System case study

Week 6	
Reading for Today	Text Book Chapter 7 – Backbone Networks
Topics Covered	➢ Backbone Networks
LAB	➢ Hands on assignment
Assignments	Ch 7 Mini Case I
Project	Next Day Air Delivery system case study

Week 7	
Reading for Today	Text Book Chapter 8 – Metropolitan and Wide Area Networks; Text Book Chapter 9 – Internet
Topics Covered	➢ Metropolitan and Wide Area Networks ➢ Internet
LAB	➢ Hands-on assignment
Assignments	Ch 8 Mini Case VI
Project	Next Day delivery system case study
Exam	Take home exam posted

Week 8 – part 1	
Reading for Today	Text Book Chapter 9 – Internet
Topics Covered	➢ Internet
LAB	➢ Hands on project
Assignments	-
Week 8 – part 2	
Reading for Today	Text Book Chapter 10 – Network Security (part 2); Text Book Chapter 12 – Network Management
Topics Covered	➢ Network Management
LAB	➢ Hands on project
Assignments	Ch 10 Mini Case II
Exam	Email exam to instructor for grading