

Department of Electrical & Computer Engineering
ECE 642 - Computer Networking
Fall 2010

Course Name: Computer Networking
Credits: 3
Classroom: Kaufman 213
Class Hours: TR 3:00 PM – 4:15 PM
Office Hours (KH 231M): MWF 11:00 AM – 12:15 PM
Instructor: Manish Wadhwa
Office: Kaufman 232
Phone: 683-3470
Email: mwadhwa@odu.edu

Required Textbooks:

Computer Networks, 4e, A.S. Tanenbaum, ISBN: 0130661023, Prentice Hall

Suggested Reference Book:

Performance Analysis of Communications Networks and Systems, 1e, P.V. Miegheem, ISBN-13: 978-0521108737, Cambridge University Press

Prerequisite Course and Knowledge:

- ECE 355 or equivalent
- C/C++ programming

Course Description and Objectives:

The course is based on the ISO (International Standard Organization) OSI (Open Systems Interconnection) reference model for data communications. A focus is placed on the analysis of protocols at different layers, network architectures, and networking systems performance analysis. The objectives are to

- Study the fundamental concepts of computer networks
- Learn the principles of data communications
- Study the architectures of LANs and WANs
- Learn the layered network protocols
- Use network simulation tools, such as OPNET and ns2, to analyze network performance
- Learn how to design simple network protocols
- Understand the fundamentals of wireless networks

Tentative Topics:

1. Introduction to computer networks
 - Uses of computer networks
 - Network hardware
 - Network software
 - Network reference models

2. The physical layer
 - The theoretical basis for data communications
 - Transmission media
 - Wireless transmission
 - Switched telephone system
 - Mobile telephone system
 - Cellular radio
3. The data link layer
 - Design issues
 - Error detection and correction
 - Elementary data link protocols
 - Sliding window protocols
 - Example data link protocols
4. The medium access control layer
 - Channel allocation problem
 - Multiple access protocols
 - 802.3 (Ethernet)
 - 802.2 (logical link control)
 - 802.11 (WLAN)
 - Bridges
5. The network layer
 - Design issues
 - Routing algorithms
 - Congestion control algorithms
 - Quality of service
 - Internetworking
 - Internet Protocol (IP)
6. The transport layer
 - Transport services
 - Elements of transport protocols
 - TCP
 - UDP
 - Network performance improvement and analysis
7. The application layer
 - The domain name system
 - E-mail
 - WWW
 - FTP
 - TELNET

Required Work:

- **Six** homework
- **One** term paper
- **One** mid-term examination
- **Final examination**

Grading Scale (%):

- Homework, 15
- Term paper, 15 (12 for term paper and 3 for presentation)
- Mid-term examination, 30
- Final examination, 40

Academic Honesty:

Students are expected to follow the ODU **Honor Code** for all assignments, term papers, and examinations. All work that you turn in with your name on it should reflect your work; references are provided at the appropriate places. A first offense will result in the homework/examination/term-paper grade of **zero** for **all** participants. A second offense will result in a grade of **F** for the course for **all** participants.

ODU Email accounts:

Please activate your email account. Important information about the class will be announced through your ODU email account.

Attendance Policy:

It is not mandatory to attend the classes. However, you are strongly encouraged to attend all classes and actively participate in the class discussion.

Make-up Examinations

Examinations can be rearranged only if the individual has a physical problem evidenced by his/her Doctor's prescription.

Questions to Your Grades

You may request the instructor to reevaluate your examinations, term papers, and other course materials if you have any question to your course grade. Written request must be submitted to the instructor within 15 days after the grade was assigned.

Honor Code

We, the students of Old Dominion University, aspire to be honest and forthright in our academic endeavors. Therefore, we will practice honesty and integrity and be guided by the tenets of the Monarch Creed. We will meet the challenges to be beyond reproach in our actions and our words. We will conduct ourselves in a manner that commands the dignity and respect that we also give to others.

Closely Related Course

ECE 742/842, offered in spring 2011