
COSC 415: Data Communications and Networking

Class Schedule:

Tuesday and Thursday, 8:00 – 9:15 in Frey 349

Instructor: D. Scott Weaver

Office: Frey 323

Office Hours: Posted on website at: <http://home.messiah.edu/~sweaver/MySchedule.shtml>

Phone: Ext 3785

Email: sweaver@messiah.edu

Course Home Page: <http://home.messiah.edu/~sweaver/COSC415>

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Course Description

This course introduces the basics of data communication and networking. Students will develop an understanding of the general principles of networking as implemented in networks connected to the Internet. Specific attention will be given to the principles of network architecture and layering, multiplexing, network addressing, routing and routing protocols. Activities include setting up a local area network, the Internet, security, network management and network performance analysis. Prerequisite: COSC 181

Overview and Objectives

The goal of this course is that the student will develop an understanding of the underlying structure of networks and how they operate. At the end of this course a student should be able to:

1. Explain basic networking concepts by studying client/server architecture, network scalability, geographical scope, the Internet, intranets and extranets.
 2. Identify, describe and give examples of the networking applications used in everyday tasks such as reading email or surfing the web.
 3. Describe layered communication, the process of encapsulation, and message routing in network equipped devices using appropriate protocols.
 4. Design and build an Ethernet network by designing the subnet structure and configuring the routers to service that network.
 5. Manage network management and systems administration.
 6. Construct a patch cord to connect a host computer to a network.
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Topics

1. Overview of computer networks, the Internet, the OSI model and TCP/IP stack.
 2. Ethernet, Token Ring, and Wireless and the methods they use of connecting to the physical layer.
 3. Data Link Layer responsibilities.
 4. Internet protocols on the Network layer and subnetting LANS.
 5. Router hardware and configuration.
 6. Routers, routed and routing protocols.
 7. TCP/IP segment, IP packet and Data Link frame formats.
 8. Network timing and Congestion Control.
 9. Peer-to-peer and client-server programming using sockets in TCP or UDP.
 10. Reliability, Connection-Oriented and Connectionless protocols on the Transport Layer, namely TCP and UDP.
 11. Applications used in every-day network-related tasks.
 12. Wireless and Mobile networks.
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Text & References

Required Text:

Behrouz A. Forouzan. *Data Communications and Networking (4th Edition)*. McGraw Hill. ©2007. ISBN: 0-07-296775-7.

Grading Policy and Course Requirements

Lab Exercises and Homework (40%)

Lab assignments are of equal value and will be explained during the course of the semester.

Homework assignments value will be explained when assigned.

Mid-Term Exam (30%)

The first in-class, closed book exam will cover all material from lectures, readings and assignments through the middle of the year.

Final Exam (30%)

The final exam has two components. The first is a router configuration component where the student will configure a 5-router network from scratch. The cumulative portion of the exam covers the term's material: text, lecture/discussion, and labs.

Attendance and Class Participation

Though attendance is not specifically graded, being on-time and prepared for this course is a factor in your success in and enjoyment of the course. It is appreciated when you notify the instructor before class if you are unable to attend or will be late. Assignments are due on the date regardless of your presence. It is your responsibility to obtain material distributed or discussed during the missed class from other students (not the instructor) and to turn in any assignments through proxy if necessary. Classes will usually discuss the readings for the day. You are expected to participate. Laboratory assignments will be turned in at the start of the class period in which they are due; lateness is penalized at 10% per class period with a maximum of two class periods late. Where applicable, assignments may be uploaded to Moodle. Academic integrity guidelines are in your student handbook. They are reinforced by an Ethics section in each laboratory handout.

Americans with Disabilities Act

Messiah College welcomes students with disabilities. If you have a documented disability and wish to discuss academic accommodations for this specific course, please contact me as soon as possible. All disability accommodations must be pre approved through the Office of Disability Services, 342 Old Main (5358).

Academic Integrity

Plagiarism representing another's work as your own will surely result in a lower grade in this course, and may result in failing the course depending on its severity. You must document any sources that you use, whether from the Internet, another person, or printed materials. This includes especially the work of other students who are currently taking this course or who have taken this course before. Academic integrity is broader than plagiarism. It includes such things as returning library materials promptly so that you are not keeping another student from completing his or her work.

All students at Messiah College must read and abide by the College's policy on academic integrity, which is found in your Student Handbook and on the Internet at:

http://www.messiah.edu/academics/advising_handbook/academic_policies/integrity.pdf

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