

CS 320 – Internetworking

Weisberg Division of Engineering and Computer Science
College of Information Technology & Engineering
Marshall University

Semester and Year:

Fall, 2008

Classroom Sections, Locations, and Meeting Times:

Section: 101 CRN: 2077 Days: TR Time: 3:30 – 4:45 Location: GH206A

Textbook:

Peterson and Davie, *Computer Networks: A Systems Approach, 4th Ed*, Morgan-Kaufmann, ISBN 978-0-12-370548-8

Course Description:

Principles and issues in interconnecting multiple physical networks into a coordinated system, operation of Internet protocols in the interconnected environment, and design of applications to operate in this environment.

Pre-requisite:

CS 210 – Algorithm Analysis and Design

Instructor:

Jonathan F. Thompson

Office Location: Gullickson Hall Room 205C

Phone: (304) 696-6349

Departmental Fax: (304) 696-5454

Email: thompsonj@marshall.edu

Office Hours: 9:30 – 11:30 MTW

Course Outcome Objectives:

At the completion of this course the student will be able to:

1. Explain the structure of the OSI reference model and its significance
2. Describe architectures for internetworking and their implementation issues.
3. Demonstrate the role of TCP as a transport layer and its implementation.
4. Demonstrate the role of UDP as a transport layer and its implementation.
5. Given the computing environment of an organization, perform network design including address assignment.
6. Demonstrate how networking tools are used for measuring network traffic and application monitoring.
7. Demonstrate knowledge of developing Internet-based applications using the TCP/IP framework.

Course Activities:*Reading Assignments*

You are expected to review the sections of the textbook that compose the in-class topics before the class in which they are covered.

In-class Quizzes

There will be twelve quizzes during the semester. Each quiz will be given on a Thursday, will take about five minutes, and will be given at the beginning of class. The questions will be on the topics that were covered in the prior two class sessions.

Programming Assignments

There will be four programming assignments to demonstrate the implementation of the theoretical material presented in the text. You are expected to complete the assignments outside of class and submit them on or before the due date.

Homework Assignments

There will be twelve homework assignments due on assorted Tuesdays during the semester.

Lab Assignments

There will be four lab assignments designed to give you hands-on experience using networking equipment. These labs are to be completed outside of class using the two networking workstations in GH206A. Check the Gullickson Hall Room 206A room schedule to determine when the lab is open during non-class hours. We will use a sign-up list so you and your lab partner can reserve the equipment in advance.

Exams

There will be a 75 minute mid-term and a 120 minute final exam.

Class Attendance, Participation, and Decorum

Students are expected to attend all class sessions and participate in class activities. Students are also expected to maintain a certain level of decorum that includes turning off (or silencing) cell phones, arriving to class on time, not sleeping during class, and keeping side conversations to a minimum.

Evaluation/Grade Computation:

Your final grade is computed by multiplying each Student Activity score by the weighted percentage and summing all of the weighted percentage values.

Student Activity	Score	Weighted %	Value	
In-class quizzes		x 0.10		
Programming Assignments		x 0.15		
Homework Assignments		x 0.15		
Lab Assignments		x 0.15		
Midterm		x 0.15		
Final Exam		x 0.20		
Class Attendance, Participation, and Decorum		x 0.10		
Grand Total =				
Evaluation Scale				
90 & Above = A	80 - 89 = B	70 - 79 = C	60 - 69 = D	59 & Below = F

Course Time

The Undergraduate Catalog states that students should plan on spending two hours of preparation time for each class hour. The course assignments and activities are designed so that you should be able to complete them within this recommended time.

In-class	45 hours
Reading assignments	18
Lab and lab report	18
Homework	18
Quiz preparation	12
Exam preparation	8
Programming Assignments	16
Total preparation time	90 hours

Schedule of Topics:

Date	Wk	In class Topic	Lab	HW/Quiz	Program
26-Aug	1-T	Course Intro 1.2 – Requirements 1.3 – Architecture			
28-Aug	1-R	1.5 – Performance			
02-Sep	2-T	1.4 – Implementation TCP Chat lab		HW1 due	Program 1 assigned
04-Sep	2-R	2.1 – Hardware 2.2 – Encoding 2.3 – Framing		Quiz 1	
09-Sep	3-T	2.4 – Error Detection		HW2 due	
11-Sep	3-R	2.5 – Reliable Transmission		Quiz 2	
16-Sep	4-T	2.6 – Ethernet		HW3 due	Program 1 due
18-Sep	4-R	2.8 – Wireless	Lab 1 Due	Quiz 3	Program 2 assigned
23-Sep	5-T	3.1 – Switching/Forwarding 3.2 – Bridges/Switches	Basic Networks	HW4 due	
25-Sep	5-R	3.3 – Cell Switching 3.4 – Implementation		Quiz 4	
30-Sep	6-T	4.1 – Simple Internetworking		HW5 due	
02-Oct	6-R	4.2 – Routing		Quiz 5	
07-Oct	7-T	4.3 – Global Internet		HW6 due	Program 2 due
09-Oct	7-R	4.3 – continued		Quiz 6	
14-Oct	8-T	Exam Review		HW7 due	Program 3 assigned
16-Oct	8-R	Mid-term Exam	Lab 2 Due		
21-Oct	9-T	5.1 – Simple Demultiplexer 5.2 – Reliable Byte Stream	Routing		
23-Oct	9-R	5.2 – continued		Quiz 8	
28-Oct	10-T	5.3 – Remote Procedure Calls 5.4 – Real-Time Applications 5.5 – Performance		HW8 due	
30-Oct	10-R	6.1 – Resource Allocation 6.2 – Queuing Disciplines		Quiz 9	
04-Nov	11-T	Fortune Cookie Day		HW9 due	Program 3 due
06-Nov	11-R	6.3 – TCP Congestion Control	Lab 3 Due	Quiz 10	Program 4 assigned
11-Nov	12-T	6.4 – Congestion Avoidance	TCP/UDP	HW10 due	
13-Nov	12-R	6.5 – Quality of Service		Quiz 11	
18-Nov	13-T	7.2 – Data Compression		HW11 due	
20-Nov	13-R	9.1 – Traditional Applications		Quiz 12	
25-Nov		No class – Thanksgiving			
28-Nov		No class – Thanksgiving			
02-Dec	14-T	9.1 – continued			
05-Dec	14-R	Web Server Day	Lab 4 Due	HW12 due	Program 4 due
09-Dec	15-T	Final Exam Review			
11-Dec		Final Exam	3:30 – 5:30pm	GH206A	

Exam Attendance

Students are required to take exams at the scheduled class period. Students may take an exam at a different time under one of the following conditions:

- They present a University Excused Absence
- They present a valid medical excuse
- Other extraordinary circumstance as determined by the instructor

Academic Conduct:

Working through the homework problems, the programming assignments, and the lab exercises are key factors in assuring your command of the course material. To encourage completion of these assignments, a significant portion of the final grade (45%) will be based on your performance in these exercises.

You are allowed and encouraged to work with other students on the completion of these assignments, subject to the following constraints:

- copying someone else's work and submitting it as your own is plagiarism and will not be tolerated
- you may work with others to develop a solution to a problem but the material you submit must be your own work and you must acknowledge your collaborators
- unless designated as a team exercise, you may not sub-divide the tasks of an assignment; each student is expected to complete the whole assignment

It is your responsibility to satisfy the spirit of this conduct. If you have any questions, please ask the instructor for clarification. Depending on the severity of the offense, the instructor may:

- Take no action
- Penalize the student on the assignment in question
- Assign the student a failing grade in the course

Communication:

Assignments, lecture notes, class communications (e-mail), etc, are all handled via the online course site. Be sure to log in regularly to check for course news.

Adaptive Methods for Disabilities:

Students with disabilities who believe that they may need accommodations in this class are encouraged to contact the instructors as soon as possible to better ensure that such accommodations are implemented in a timely fashion. A reasonable period of time must be given to the instructors when making your initial request for any accommodation.

Bibliography:

Tannenbaum, Andrew, *Computer Networks, 4th Ed.* Prentice Hall, Upper Saddle River, NJ 07458
Kurose and Ross, *Computer Networking: A Top-Down Approach, 4th Ed.* Addison-Wesley, ISBN 978-0-321-49770-8

Internet Web Sites:

Course Materials

www.mkp.com/pd4e

Java software and documentation

java.sun.com