

INST346: Technologies Infrastructure and Architecture  
Education Building, Room 3315,  
Monday, Wednesday, Friday, 1:00–1:50 PM  
Fall 2017

## Course Details

**Instructor:** Dr. Cody Buntain

**Classroom:** EDU3315

**Office:** Hornbake South 2116A

**Office Hours:** Monday, Wednesday, 2:15–3:15 PM

**Email:** cbuntain@cs.umd.edu (Please include “INST346” in the subject of your emails to me)

## Course Description

Examines the basic concepts of local and wide-area computer networking including an overview of services provided by networks, network topologies and hardware, packet switching, client/server architectures, network protocols, and network servers and applications. The principles and techniques of information organization and architecture for the Web environment will be covered along with such topics as management, security, authentication, and policy issues associated with distributed systems.

## Textbook

*Computer Networking – A Top-Down Approach*, Kurose and Ross. 7<sup>th</sup> Edition

## Course Objectives

At the completion of this course, students will be able to:

1. Describe the end-to-end process that occurs between when an Internet user enters a URL address into the browser and when the content is displayed.
2. Explain the differences in this process based on how a user is connected to the Internet (e.g., ethernet cable versus WiFi connections versus cellular connection).
3. Show how an ISP knows where to send a web site request to get data from Google or Facebook (i.e., routing algorithms).
4. Illustrate how a network responds to congestion and the optimizations that can speed up data transfer.
5. Identify some of the main security concerns on an open network like the Internet and the solutions that try to address these problems.
6. Write software that can communicate over networks and analyzing network traffic.

## Late Policy

For assignments turned in one class late, you will lose 25% of your grade. Assignments more than one class late will not be accepted.

## Grading Policies

Your grades will be determined through assessment of the following items, with each counting for a percent of your final grade:

Item	Description	Percent
Participation	Asking questions, participating in class discussion, and helping your fellow students	10%
Homework	Problem sets to review and reinforce lecture material	20%
Labs	Wireshark and programming exercises	20%
Pre-Class Quizzes	Short assessments of your preparation for class	10%
Midterm Exams	Two 50-minute examinations to assess your understanding vocabulary and material covered	20%
Final Exam	A comprehensive examination of the material covered in this course	20%

**Homework/Labs** All homework and labs are due before class begins one week from the date indicated on the syllabus. The homework assignments are designed to provide an opportunity for students to explore specific topics in a structured way. Students may work together on homework assignments and labs, but all of the material that is turned in for grading must be produced individually. For example, students may form study groups and work out homework solutions together on a board or by each working separately on different terminals and then sharing what they have learned, but it would not be permissible for one student to produce a single homework assignment for the group that is then copied and distributed to other group members. The goal of this policy is to encourage the use of homework as a learning aid.

**Pre-Class Quizzes** Online quizzes will be available on ELMS from the end of the previous class until class begins. Quiz content will be taken entirely from the reading assignment, and the purpose of the quiz is to ensure that everyone had completed the reading before class begins so that we can focus on understanding the ideas, rather than simply mastering the facts, in class.

**Exams** There will be two exams during the semester, each of which will occupy an entire class session, and one final exam during the final exam period, as shown on the syllabus. The first exam will focus on the first two modules, the second exam will focus on the third, fourth and fifth modules; the the final exam will be comprehensive. Students may not communicate with or receive assistance from any person other than an instructor of this course when taking an exam. Material from the readings is testable even if not covered in class. All exams will be open book and open notes.

**Letter Grade Distribution** Your final grade for the course is computed as the sum of your scores on the individual elements below (100 possible points total), converted to a letter grade:

Letter	-		+
A	90-92.99	93-96.99	97-100*
B	80-82.99	83-86.99	87-89.99
C	70-72.99	73-76.99	77-79.99
D	60-62.99	63-66.99	67-69.99
F	0-59.99		

\* Note: To receive an A+ you must have demonstrated significant contributions to the class in addition to achieving this numeric grade.

## Course Calendar

Week	Dates	Material	Assignment*
Week 1	8/28, 8/30, 9/1	Introductions and Defining the Internet (Ch.1)	HW1
Week 2	9/6, 9/8	An Overview of Computer Networks (Ch.1)	Lab 1
Week 3	9/11, 9/13, 9/15	The Application Layer (Ch.2)	HW2
Week 4	9/18, 9/20, 9/22	Network Applications (Ch.2)	Lab 2
Week 5	9/25, 9/27, 9/29	The Transport Layer+UDP (Ch.3)	<b>Relax</b>
Week 6	10/2, 10/4, 10/6	The Transport Layer+TCP (Ch.3), and Midterm 1	HW3
Week 7	10/9, 10/11, 10/13	TCP, Congestion, and Net Neutrality (Ch.3)	Lab 3
Week 8	10/16, 10/18, 10/20	The Network Layer (Ch.4)	HW4
Week 9	10/23, 10/25, 10/27	Building a Router (Ch.4)	Lab 4
Week 10	10/30, 11/1, 11/3	Routing Algorithms (Ch.5)	<b>Relax</b>
Week 11	11/6, 11/8, 11/10	Reflections and Midterm 2	HW5
Week 12	11/13, 11/15, 11/17	The Link Layer (Ch.6)	Lab 5
Week 13	11/20	Wired and Wireless Networks (Ch.6-7)	HW6
Week 14	11/27, 11/29, 12/1	Wireless Networks (Ch.7)	Lab 6
Week 15	12/4, 12/6, 12/8	Network Security	HW7
Week 16	12/11	Network Security and Final Exam Review	<b>Relax</b>
Final Exam	12/14	1:30-3:30 PM	

\* All assignments are due on the last class of the following week. E.g., HW1 is will be assigned on Friday, September 1 and will be due Friday, September 8. Lab 1 will be assigned Friday, September 8 and will be due on September 15, etc.

## Academic Integrity

The University of Maryland, College Park has a nationally recognized Code of Academic Integrity, administered by the Student Honor Council. This Code sets standards for academic integrity at Maryland for all undergraduate and graduate students. As a student you are responsible for upholding these standards for this course. It is very important for you to be aware of the consequences of cheating, fabrication, facilitation, and plagiarism. For more information on the Code of Academic Integrity or the Student Honor Council, please visit <http://shc.umd.edu/SHC/default.aspx>. Cases of academic misconduct will be referred to the Office of Student Conduct irrespective of scope and circumstances, as required by university rules and regulations. There are severe consequences of academic misconduct, some of which are permanent and reflected on the student's transcript. For details about procedures governing such referrals and possible consequences for the student please visit <http://osc.umd.edu/OSC/Default.aspx>

## Special Needs

Students with disabilities must contact the Disability Support Services (301-314-7682, <http://www.counseling.umd.edu/DSS/>). Disability Support Services will make arrangements with the student and the instructor to determine and implement appropriate academic accommodations. Do this early; accommodations can not be provided retroactively. Students wishing to discuss accommodations for unusual circumstances should see Dr. Oard; issues that are known in advance should be discussed by the end of the second week of the semester. We will make any accommodations that are required by law or university policy. Please note, however, that the grading policy already includes accommodations for students who miss one exam, quiz, or homework assignment submission, and that homework and project materials may be turned in in advance. Necessary accommodations which exceed that degree of flexibility are extremely rare.

The University's Counseling Center (301-314-7651, <http://www.counseling.umd.edu/>) also provides a broad range of expert help to students who are having difficulty with their coursework or with other aspects of their life, and the use of their services is encouraged any time it can be helpful.

## **UMD Course-Related Policies**

You can familiarize yourself with the university's course-related policies here: <http://www.ugst.umd.edu/courserelatedpolicies.html>.

## **Syllabus Modification**

I reserve the right to alter the schedule and due dates for assignments listed in this syllabus. Modifications will be announced in class and posted online.