

CSCI 440

Computer Networks

Fall 2017

Instructor: Xenia Mountroudou (Dr. X)
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Office: Harbor Walk East, Room 312
Office Hours: Tues/Thurs 10:00 am – 12:00 noon or by appointment

Overview

An introduction to networking theory and practice. Topics include transmission media and modulation; error detection; protocols – particularly TCP/ IP; packet switching and circuit switching; physical, data link, network, transport, and application layers; LANs and WANs; network topologies; internetworking and the Internet; queuing theory and mathematical analysis of networks.

Prerequisites: CSCI 340, MATH 250, and MATH 307.

Outcomes

After completing CSCI 440 students will be able to:

1. Analyze computer network communication protocols.
2. Develop tools and reproduce protocols for network communication.
3. Evaluate the performance of a computer network based on queueing theory and statistics.
4. Communicate using technical writing.

Materials



Required book:

“Computer Networking: A Top-Down Approach”, by Kurose & Ross, 7th edition. ISBN-13: 978-0133594140, ISBN-10: 978-0133594140

Reading assignments and exercises will be taken from the textbook.

Other books you may find useful:

“Computer Networks”, by Tanenbaum & Wetherall, 5th edition

Software:

1. Wireshark
2. Putty or any other terminal software

Class Meeting Times: Tuesday/Thursday 2:05 – 3:20 pm

Class Location: HWEA ???

Office hours: Tuesday/Thursday 10:00 am – 12:00 noon

Office Location: HWEA 312

Course Website:

<http://mountroudoux.people.cofc.edu/CSCI440/index.html>

We will use Oaks for assignment submission and grading

Evaluation

Midterm	20%
Final	20%
Project	30%
Homework	20%
Participation	10%
Total	100%

Your weighted average will result in a letter grade assigned per the usual scale: 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: below 60%

➤ Homework

- ❖ Homework assignments will be based on your reading.
- ❖ You may complete the homework assignments in *teams of maximum two members*.
- ❖ You will have approximately one homework assignment every two weeks.

➤ Project

- ❖ The project will be completed by *teams of minimum two, maximum three students*.
- ❖ The topic of the project will be picked out of a pool of relevant topics. You may suggest your own topic.

➤ Tests

- ❖ There will be two tests: a midterm (Oct. 12) and a *cumulative* final.
- ❖ The tests will be closed book.
- ❖ You may use one cheat sheet, i.e., a regular sized page written in front and back.

➤ Participation:

- ❖ Participation will be dependent on your *active in class participation*.
- ❖ You need to actively answer and ask questions during class to earn active in class participation points.
- ❖ *There will be in class labs that will count in your participation grade. You will need to complete and submit short reports on these labs.*
- ❖ The participation points are dependent on my discretion based on your attention and active preparation.

Late Submissions

- Deadlines are firm.
- You may submit up to two days late with 20% penalty for each day that you are late.
- *A score of zero will be assigned to any project/homework that has not been submitted within two days after the deadline.*

Re-grading

If you have a request for re-grading, you need to ask me to re-grade your exam or homework up to one week (five business days) after this has been returned to you. *There will be no re-grading if the test/project that is older than one week.* I reserve the right to re-grade the full test/project. This means that I will not re-grade only the part you have requested, but the whole exam/homework and add or reduce points accordingly.

Missed Exams

If you miss an exam, the only way to take this test on a different day is to have an official document (ex. from doctor, coach) verifying the reason you had to miss the test AND to let me know with an email BEFORE the exam, that you will miss the exam. Please refer to the student handbook “Class attendance policies” for a more detailed description of excused absences. A reason to miss the test may be a health issue, a sports tournament you had to participate, or an important personal issue. I will consider rescheduling on a case-by-case basis.

Attendance

Regular attendance is expected of all students. For any grade to be awarded, participants must attend at least 85% of the class hours. Participants are expected to attend all sessions, ***be punctual***, and remain for the duration of each class. In the rare case where some absence is required, make up work will be assigned where it is practical to do so. Attendance is also part of the grading scale. Students may be withdrawn by the instructor if absences violate these guidelines.

Schedule

The schedule is tentative and *subject to change* during the semester.

Week	Topics	Readings due	HW Due (at the beginning of class)	Team Project Due
Week 1	Introduction, Syllabus, Big picture computer networks	Syllabus, ch. 1	H0: install wireshark, get a GENI account	
	Application Layer: Web, HTTP, Intro to Wireshark	ch. 2		Pick teams, setup meetings
Week 2	Application Layer: SMTP, DNS, P2P, Sockets	ch. 2		
	Application Layer: SMTP, DNS, P2P, Sockets	ch. 2	H1 (H = Homework)	
Week 3	Transport: Multiplexing, demultiplexing, UDP	ch. 3		
	Transport: TCP	ch. 3		
Week 4	Transport: TCP	ch. 3		

	Transport: Congestion Control	ch. 3	H2	
Week 5	Network: Data Plane, Project Presentations	ch. 4		D1 (D = Deliverable)
	Network: Data Plane	ch. 4		
Week 6	Network: Data Plane	ch. 4		
	Network: Data Plane	ch. 4	H3	
Week 7	Network: Control Plane	ch. 5		
	Network: Control Plane	ch. 5		
Week 8	Network: Control Plane, Midterm review	ch. 5		
	Midterm Exam			
Week 9	No Classes - Fall Break			
	Network: Control Plane, Project Presentations	ch. 5	H4	D2
Week 10	Network: Control Plane	ch. 5		
	Network: Control Plane	ch. 5		
Week 11	Data Link	ch. 6		
	Data Link	ch. 6	H5	
Week 12	Data Link, Project Presentations	ch. 6		D3
	Data Link	ch. 6		
Week 13	Wireless	ch. 7		
	Wireless	ch. 7	H6	
Week 14	Wireless	ch. 7		
	No Classes - Thanksgiving			
Week 15	Final Review			
	Project Presentations			D4
Week 16	Final Exam - Dec. 7, 4 - 7 pm			

Honor Code

Lying, cheating, attempted cheating, and plagiarism are violations of our Honor Code that, when suspected, are investigated. Each incident will be examined to determine the degree of deception involved.

Incidents where the instructor determines the student's actions are related more to a misunderstanding will be handled by the instructor. A written intervention designed to help prevent the student from repeating the error will be given to the student. The intervention, submitted by form and signed both by the instructor and the student, will be forwarded to the Dean of Students and placed in the student's file.

Cases of suspected academic dishonesty will be reported directly by the instructor and/or others having knowledge of the incident to the Dean of Students. A student found responsible by the Honor Board for academic dishonesty will receive a XXF in the course, indicating failure of the course due to academic dishonesty. This status indicator will appear on the student's transcript for two years after which the student may petition for the XX to be expunged. The F is permanent.

Students should be aware that unauthorized collaboration--working together without permission-- is a form of cheating. Research conducted and/or papers written for other classes cannot be used in whole or in part for any assignment in this class without obtaining prior permission from the instructor.

Students can find the complete Honor Code and all related processes in the Student Handbook at <http://studentaffairs.cofc.edu/honor-system/studenthandbook/index.php>

What is plagiarism?

The unauthorized use or close imitation of the language and thoughts of another author and the representation of them as one's own original work, as by not crediting the author. (*Source: dictionary.com*)

As you noticed above, I am citing the Internet source from which I used my information. Plagiarism includes using material from the Internet without citing the website from which you got your material. Books, articles and any hard copy sources should be cited as well. Plagiarism is considered cheating.

Plagiarism and coding (what you can and cannot do!):

1. You may look up examples on the Internet.
2. You may NOT copy paste code from the Internet and present it as your own. Avoid copy pasting code from the internet and use this as a last resort ALWAYS with citation to the website that you used.
3. You may use libraries that are included in the Java API.
4. If you plan to use a library that is not on the Java API in a project, you will need to discuss this with me.

Discussing solutions with other students: Make sure you apply the “**empty hand policy**”, i.e., do not copy or use material from the discussion, just interact, brainstorm. You *cannot look at someone's code and then type it*. You *cannot share the programs*, write code on a paper and share it with someone, or in any form whatsoever share your programs.

Collaboration in teams is allowed only if I have explicitly described in the project/homework assignment. You may collaborate based on the principles of pair programming (see below) and only if I have authorized teams. The Honor Code applies to the team members.

Pair Programming

Programming projects can be performed in teams of two members. The goal is to learn pair programming principles and extreme programming techniques that are used in industry. This allows the students to learn from each other and learn to collaborate. The main responsibilities for such collaboration are:

1. All the members of the team need to have project ownership, i.e., participate equally in the design, development and documentation. The instructor will ask in depth questions to all members of the team.
2. **All programming must be done in the pair.** Do not continue programming outside the pair. If you can't finish in one session, meet again. If that's impossible, save a copy of the code you pair-programmed for separate submission. Then work alone to finish the code. Review the part you coded alone with the other team members.
3. You need to follow the rules of pair programming, switching roles from observer to driver every 15 minutes or so.
4. All members receive the same grade.
5. A team leader will make the assignment submission. This is just to maintain one submission per team and in no way the team leader should do less or more work than the rest of the team members.
6. Students need to bring up collaboration issues early (first week of assignment) in order to switch teams.

Accommodations for Adults with Disabilities

The College will make reasonable accommodations for persons with documented disabilities. Students should apply for services at the Center for Disability Services/SNAP located on the first floor of the Lightsey Center, Suite 104. Students approved for accommodations are responsible for notifying me as soon as possible and for contacting me one week before accommodation is needed.

Final Notes

- I have a Greek accent that may be hard to understand sometimes. Please do not hesitate to ask me to repeat something.
- If you need to record the class, you may do this with your phone if you do not disturb the class.
- Please respect your classmates. Put your phone on silent mode before the lecture starts.