CSCE 462/862 – Communication Networks

Spring 2016, MWF 2:30PM – 3:20PM
Room 106, Avery Hall

Instructor

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Teaching Assistants

Feiyu Zhu (Graduate)
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Office Hours: Tuesday 3:00PM – 5:00PM.
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Description

This course will introduce the students to the architecture of communication networks, a voyage to the heart of our cyber society, revealing the under-the-hood secrets of one of the largest and most complex systems ever engineered: the Internet. We will delve into the fascinating world of the latest internet applications (VoIP, YouTube, Netflix) and see how they actually work. We will uncover the secrets of a transport protocol: how two entities can communicate reliably over a medium that may lose and corrupt data. Then, we will look at how a piece of information (packet) from your home can take an intricate route around the world to go to your friend down the road. We will then study how a many computers connected to the same link can diligently transmit messages without interfering, and how a corrupted message can be restored to its original state through both simple and sophisticated techniques. We will finish by studying how a message is physically propagated between a transmitter and a receiver, and some of the principles of Wireless, Mobile, and Sensor Networks (WiFi, 3G, and 4G), keeping always an eye to everyday practical use cases.

Prerequisites

- Computer Organization (CSCE 230/230H) or Foundations of Computer Systems (RAIK 284/284H, JDEP 284/284H)

- Data Structure and Algorithms (CSCE 310/310H) or Foundations of Computer Science (RAIK 283/283H, JDEP 283/283H)

Or consult with the course instructor by email or appointment.

Required Textbook   **Computer Networking: A Top-Down Approach**
6th Edition, by James F. Kurose and Keith W. Ross
(ISBN-10: 0132856204 • ISBN-13: 9780132856201)

Optional Textbooks   Communication Networks: Fundamental Concepts and Key Architectures
by Alberto Leon-Garcia and Indra Widjaja

Computer Networks
by Andrew S. Tanenbaum, David J. Wetherall

Computer Networks: A Systems Approach
by Larry L. Peterson and Bruce S. Davie

Course Topics
1. Introduction to Communication Networks and the Internet
2. The Application Layer
3. The Transport Layer
4. The Network Layer
5. The Link Layer
6. The Physical Layer
7. Advanced Communication Network Topics
   a. Wireless Networks
   b. Multimedia Networking

Course Organization
- TWO Exams
  - Midterm Exam
  - Final Exam
- Homework Assignments
  - To be solved individually
- **Course Project (optional for undergrads)**
  - Create small projects in **NS-3** and/or **Python** applying the theory learned in class
  - To be solved in **groups of 2 people** (*tentative*)
  - Will help you consolidate the concepts seen in class in a more practical and engaging way

Grade Distribution   **Graduate Students:**
Homeworks Assignments: 20%
Laboratory Projects: 15%
Midterm Exam: 30%
Final Exam: 30%

In-class Participation and Professionalism: 5%

Undergraduate Students:
Homeworks Assignments: 25%
Midterm Exam: 35%
Final Exam: 35%
In-class Participation and Professionalism: 5%

For undergraduate students who turn in lab project assignments, the final grade will be the best between the two distributions

Additional Materials	All the following additional materials will be available in Blackboard Learn:

- Lecture notes
- Additional reading resources
- Homework assignments
- Laboratory Project task assignments and software

Homeworks

Homework submissions will be through through the web handing system.
Late homework is penalized 10% per day, and no homework will be accepted after the solution is posted online

Academic Integrity

All homework assignments, quizzes, exams, etc. must be your own work. No direct collaboration with fellow students, past or current, is allowed unless otherwise stated. The Computer Science & Engineering department has an **Academic Integrity Policy**:

http://cse.unl.edu/ugrad/resources/academic_integrity.php

All students enrolled in any computer science course are bound by this policy. You are expected to read, understand, and follow this policy. Violations will be dealt with on a case by case basis and may result in a failing assignment or a failing grade for the course itself.

Students with Disabilities

Students with disabilities are encouraged to contact the instructor for a confidential discussion of their individual needs for academic accommodation. It is the policy of the University of Nebraska-Lincoln to provide flexible and individualized accommodations to students with documented disabilities that may affect their ability to fully participate in course activities or to meet course requirements. To receive accommodation services, students must be registered with the Services for Students with Disabilities (SSD) office, 132 Canfield

Administration, 472-3787 voice or TTY.

Suggestion Box The CSE Department has an **anonymous suggestion box** (http://cse.unl.edu/department/suggestion.php) that you may use to voice your concerns about any problems in the course or department if you do not wish to be identified.

Stay Up-to-date It is CSE Department policy that all students in CSE courses are expected to regularly check their email so they do not miss important announcements.

CSE Resource Student Center The CSE Student Resource Center (Avery Hall 13A) is intended to provide UNL Computer Science and Computer Engineering majors who are new to the program with a set of resources that will help them assimilate to college life and encourage them to continue their study of Computer Science and Computer Engineering (http://cse.unl.edu/src).

This syllabus will be updated and expanded as the semester progresses.