Course Overview

This is an undergraduate-level course in computer networking, focusing on the applications and protocols that run on the Internet. CPSC 360 is a programming-intensive course, using Java at first, but then moving to writing programs in C. By the end of the semester, you will have written TCP and UDP client-server programs in Java and C, a chat program, and another network application of your choice (e.g., a networked game, a web client, etc.). The course includes a project which requires you to work in a group with your fellow classmates. This project will require a written report and possibly a class presentation. Along with writing networked applications, you will learn the basics of Internet transport, including IP, TCP, UDP and the client-server architecture.

Prerequisites

Prerequisites for this course are:

- A grade of C or better in these courses:
  - CPSC 212 – Algorithms and Data Structures
  - CPSC 215 - Tools and Techniques for Software Development
- A working knowledge of the Unix program development environment
- A working knowledge of Java and C

Course Materials

These are the required textbooks for this course:


Other helpful books include the following:

- *Pointers on C*, by Kenneth Reek, Addison-Wesley.

- *Internetworking with TCP/IP vol. III: Client-Server Programming and Applications*, BSD version or Linux/Posix Sockets version.

Grading

Final grades in the course will be assigned based on a 10-point scale. A grade of 90% or above is guaranteed an A, 80% or above at least a B, 70% or above at least a C, and 60% or above at least a D.

Your grade in this class will based on the following:¹

- **Homework** 20%
  There will be 4-8 homework assignments. *These are to be completed individually* unless otherwise stated. They are due at the beginning of class on the due date.
  **Note:** All programming assignments will be designed to facilitate automated testing. There will be **huge** penalties for programs that do nothing more than give a core dump. To be eligible for any partial credit, you must have **something** working.

- **Quizzes** 10%
  There will be a set of quizzes. Most will be in-class (some announced, some not!), but some might be take-home. *These are to be completed individually.* I will drop the lowest quiz grade at the end of the semester.

- **Final Project** 20%
  You will work in teams of 2-3 students on a project that you choose (and is approved by the instructor). In addition to completing the research project, you will write a research report with a maximum length of 10 pages. Time permitting, at the end of the semester your team will give a 10-minute presentation to the class on your research project.

- **Midterm** 25%
  There will be a midterm exam scheduled prior to the last day to drop classes. I will have them graded before the drop date.

- **Final** 25%
  Our final exam is scheduled for 8-11 am, Wednesday, May 4.

Late Assignment Policy

Any assignment submitted after its deadline is considered late. Assignments that are submitted between within 24 hours after the original deadline are considered to be “one day late,” within 24-48 hours, “two days late,” etc. Assignment grades will be deducted 10% of the total grade for each day the assignment is late. Weekends count just like weekdays in determining the number of days late. **No assignment over 3 days late will be accepted.**

Academic Integrity

Please refer to the statement on academic integrity given below. Any evidence of cheating will result in a 0 grade for the assignment/exam, and the incident will be submitted to the department for further review.

"*As members of the Clemson University community, we have inherited Thomas Green Clemson's vision of this institution as a 'high seminary of learning.' Fundamental to this vision is a mutual commitment to truthfulness, honor and responsibility, without which we cannot earn the trust and respect of others. Furthermore, we recognize that academic dishonesty detracts from the value of a Clemson degree. Therefore, we shall not tolerate lying, cheating, or stealing in any form.*"

Attendance

I expect you to attend class and to arrive on time. If you have to miss a class, let me know in advance. It is your responsibility to check the course website to find any assignments or notes you may have missed.

Students may leave after 15 minutes if the instructor or a guest lecturer does not arrive in that time.

¹ The percentages listed are only approximate and are subject to change (by no more than 10%).
Make-ups

Make-ups for graded activities are possible only with a valid written medical or university excuse. It is the student’s responsibility to give the instructor the written excuse and to arrange for any makeup work to be done.

A makeup exam will be different (and possibly more difficult) than the regularly scheduled exam.

Seeking Help

The course website should be your first reference for questions about the class. The schedule will be updated throughout the semester with links to lecture notes and assignments. Announcements and frequently asked questions (FAQ) will also be posted to the course website.

The best way to get help on assignments and in understanding lectures is to come to office hours. I am available via email, but do not expect or rely on an immediate response.

Since this course will include several programming assignments, here’s a word of advice – start working on assignments early! An hour spent reading and understanding an assignment on the day it is given out will be worth many hours on the night before it is due.

Course Outline

The course will cover the following topics (subject to change):

- Network Applications
- Client-Server Architecture
- Java Network Programming / C Network Programming
- Physical Data Transmission
- Packet Transmission and Local Area Networks (LANs)
- Routing
- Network Protocol Layering
- Internet Protocol (IP)
- Address Resolution Protocol (ARP)
- Internet Control Message Protocol (ICMP)
- User Datagram Protocol (UDP)
- Transmission Control Protocol (TCP)
- Domain Name System (DNS)
- Email