CS4254: Computer Network Architecture and Programming

Course: CS 4254
Class: 12:30 – 1:45pm Tu-Th
Room: Hutcheson 409
URL: http://courses.cs.vt.edu/~cs4254/

Instructor: Dr. Srinidhi Varadarajan
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Office hours: 10:00am - 11:00pm Tue-Thu

GTAs: John Gordon, Varun Pandey
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Office Hours: M-F 6-7 pm
Location: McB 118 (CS Undergraduate Lab)

Course Objectives

- Explain the basics of computer communication through different physical media such as wires, fiber optics and unguided media
- Explain concepts behind network protocols and identify the key problems they solve
- Explain the seven-layer OSI communication protocol model
- Explain the architecture and protocols comprising the Internet
- Implement network services that communicate through the Internet
- Identify the network programming abstractions in use today

Prerequisites

- CS3204 (Operating Systems)
- Strong programming ability in C (required).
- User-level understanding of the UNIX operating system
- Ability to undertake substantial independent design projects

Resources

Required text:

- Douglas E. Comer and David L. Stevens, *Internetworking with TCP/IP Volume III: Client-Server Programming and Applications*, Linux/POSIX sockets version, Prentice Hall, 2001

Recommended text:

- Douglas E. Comer, *Internetworking with TCP/IP Volume I: Principles, Protocols, and Architecture*, 3rd edition, Prentice Hall, 1995.
- Andrew Tannenbaum, *Computer Networks*, Third Edition, Prentice Hall, 1996

Additional resources:

- World Wide Web site: http://courses.cs.vt.edu/~cs4254/
- Electronic Forum: forum.cs.vt.edu (please register at this site and use the CS4254 section for all electronic discussion)

(*All students are required to have email and WWW access*)

Grading

Semester grades will be determined after all work is completed and graded. Point ranges for letter grades may be based on a number of factors, including absolute and relative performance.

Homework	10%
Projects (3)	45%
Midterm Exam	15%
Final Project	30%

Assignments

All students are required to know how to create and send assignments electronically (using FTP). Assignments submitted after the due date will not be accepted unless extenuating circumstances exist and special arrangements are made prior to the due date.

Homework: Homework assignments will consist of problems from the text and supplemental problems provided by the instructor. Problem sets will be graded on overall effort and correctness of selected problems.

Projects: Projects require the design, implementation, and testing of small network applications. The project code should be submitted electronically. Results and project reports should be submitted in paper form.

Final Project: The final project involves the design, implementation and validation of an "**industrial strength**" network service or application. A suggested project will be provided. If you wish to take up a different project, please contact the instructor. Students may pair up in groups of two (2) for the final project.

Midterm: There will be one in-class midterm. The exam will be open book and open notes.

Honor Code Policy

Adherence to Virginia Tech's honor code is expected in all phases of this class. All graded work is expected to be the original work of the individual student unless otherwise directed by the instructor. In working on problem sets, discussion and cooperative learning are allowed and, in fact, encouraged. However, copying or otherwise using another person's detailed solutions to assigned problems is an honor code violation. Projects are to be the work of the individual student. You may discuss general concepts, such as system calls, software libraries, Internet resources, or class and text topics, with others. However, discussion of project solutions, specific code, or detailed report content is an honor code violation. All source material used in project code and reports must be properly cited. Please discuss any questions that you may have about what is or is not permitted with the instructor.

Special Needs or Circumstances

Any students with special needs or circumstances should feel free to meet with or otherwise contact the instructor.

Course Topics

A full, updated schedule is available at the class web site.

- Client / Server architecture
- Programming interfaces and sockets
- Client / Server algorithms and issues
- Client / Server design techniques
- Internet protocols suite
- Network programming abstractions
- Multimedia
- Network security