CSI/MAT 470 – Computer Networks – Spring 2021

Professor: Shaun D. Ramsey, Ph.D. (Dr. Ramsey with he/him/his pronouns)
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Office: DUNN N106a - but, I won't be on campus
Office Hours: M:1:30-2:30, Tu: 1-2:30, Th: 2:30-3:30, (or by drop-in and appointment)
Discord: `https://discord.gg/94VUrxj`
Class meetings: 470-10 Thursdays 1:00-2:15PM - synchronous on Discord - see above
   There will be no Tuesday meeting – handled asynchronously.
Text: Computer Networks: A Systems Approach by Peterson and Davie
   Available online at: `https://book.systemsapproach.org/index.html`
Text: Beej's Networking Guide
   Available online at: `https://beej.us/guide/bgnet/`
Optional Text: Computer Networking: A Top-Down Approach by Kurose/Ross
Web: `http://shaunramsey.com/class/21SPRING/470.html`

Overview and Advising: Overview and Advising: Computer Networks have become integral in computing. From cell phones to laptops, network connectivity is ready at the fingertips daily. This course covers the basics of each layer in networks. From error detection, CRCs, subnets, and routing algorithms all the way to top-level application development, this course covers topics theoretical in the invention of networks as well as the practical.

Suggestions: This course will use 'lower' level programming (C) as a foundation leading into building basic client/server programs. But, client/server programs can be done in high level programming languages like python. The system calls learned here do translate to python and you can find guides for such. However, part of the goal of this systems course IS to dive closer to the system and thus, we will use C as our language. Haven't used C? Don't fret, our first steps will be in capturing the programming paradigm and control sequences required. Importantly, the natural tendency is to procrastinate on pre-work and homework problems. **Do not do so.** You will need to practice, fail, try again and get help in order to succeed. As an advanced course, I expect this diligence of each of you.

Grade Breakdown:

Participation and Engagement: 5%

Homeworks/Canvas Prompts/Canvas Quizzes: 45%

Programming Projects: 50%
    C Homework: 5%
    Client Homework: 10%
    Server Homework: 15%
    Application Homework: 20%

Attendance: Attendance is strongly encouraged and will be tracked.

Lateness: I reserve the right to give any late assignment a score of 0. In this course, we'll often be building client/server programs that interact with one another. So it becomes important, for most assignments to be handed in precisely on time. Canvas prompts will have a hard close. We learn this material by doing it so hit the ground running!

Accommodations: If you have an accommodation that has been reported to the college, please let me know as soon as possible so I can work to meet your accommodation. Please notify me of any necessary accommodation at least two weeks prior to the requirement so we can make it happen. If you suspect you might need an accommodation, I recommend that you speak with OAS as soon as possible.

Academic Honesty: You are always subject to the Honor Code of Washington College. All work must be your own. When handing in any assignment you are required to cite every reference, including web pages. Failure to do so will be considered plagiarism.

Career Center: It is important to utilize all the resources available to you. The Career Center is a wonderful center dedicated to helping you. You can receive mock interviews there, attend a career fair, and even attend a workshop on graduate school admissions. For more information on these programs and other ways to connect with the Center for Career Development, please contact Nanette Cooley at ncooley2@washcoll.edu.

Counseling Center: We all experience stressful and difficult events as a normal part of life and especially right now. As your instructor, I am not qualified to serve as a counselor, but I am a useful ear. So please feel welcome to open a discourse with me. I may guide you to a counselor and if you do need an actual counselor, Washington College offers counseling services on-campus that are available to you at no cost. All counseling services provided are completely confidential and in no way connected to your academic record. I strongly encourage you to take advantage of this valuable resource. Please contact The Office of Counseling Services at 410-778-7261, or email: vanderson2@washcoll.edu to schedule an appointment.

General Tentative Schedule:

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Week 1 Introduction, logins and C (Beej)
Week 2 basics and commands DNS, IP address, dig, nslookup, tracert, c hw
Week 3 Foundation, c first hw (Ch 1)
Week 4 Encoding, Framing and Error Detection (Ch 2)
Week 5 Reliable Transmission (Ch 2),
Week 6 Switching and IP (Ch 3), client hw
Week 7 Routing (vs Switching) (Ch 3)
Week 8 Transport Protocols (UDP vs TCP) (Ch 5)
Week 8 Queues and Resources (Ch 6), server hw
Week 9 Congestion Control (Ch 6)
Week 10 Protocol Design
Week 11 Compression (Ch 7), app hw
Week 12 Crypto Basics (Ch 8)
Week 13 Authentication (Ch 8)
Week 14 Applications and REST (Ch 9)

Note: This document and a tentative week by week schedule are available from the website listed above.