CSCI 6760 - Computer Networks
Fall 2024

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CSCI 6760

- What is the purpose of this course?
  - Graduate-level computer networks course
  - Focuses on understanding how the Internet works:
    - How do Internet nodes communicate with each other?
    - What are the network protocols that make this complex interconnection of computer networks exchange data in a reliable way?

- We will follow a top-down approach
  - Understand how Internet applications exchange information
  - The client-server paradigm
  - Transport protocols
  - Reliable communications over non-reliable packet switching
  - Network Layer, Routing
  - The Link layer
  - Security

Books

- **Textbook:** *Computer Networking: A Top-Down Approach Featuring the Internet, 8/e (7/e should also be OK)*
  - James F. Kurose and Keith W. Ross
  - Addition Wesley

- **Recommended Readings:** *TCP/IP Illustrated, Volume 1: The Protocols*
  - W. Richard Stevens
  - Addition Wesley

- **Other resources:** *The TCP/IP Guide*
  - Charles M. Kozierok
  - Available online at: http://www.tcpipguide.com/free/index.htm

Course logistics

- Grading
  - Paper Presentations = 10%
  - Development Projects and Assignments = 45%
  - Exams = 45%

Presentations (10%)

▸ Throughout the term, students will be required to read academic papers, protocol RFCs, or other docs

▸ Students will present the paper/RFC at the end of the semester

▸ NOTE: Some of the topics discussed in the assigned papers may be part of the exams

Development Projects (45%)

▸ **Students will be required to complete development projects**
  ▸ Build network tools mostly developed in Python or C
  ▸ Some others may require Bash scripting
  ▸ Assignments may also include network traffic analysis tasks
  ▸ Most projects must be conducted individually
  ▸ Others may be conducted in pairs (I will indicate which ones), in which case the evaluation will be the same for both students
  ▸ Projects may be evaluated with a *binary criteria*
    ▸ It works correctly => X points (X depends on project difficulty)
    ▸ It does not work (does not compile, fails tests, etc.) => 0 points
    ▸ I will announce possible exceptions to this rule for specific projects

  ▸ Code written for Linux
    ▸ **Ubuntu** will be our reference distribution
    ▸ An Ubuntu VM will be assigned to you

Development Projects

‣ Each student ~~will be assigned a VM~~ with Ubuntu Linux

  ‣ Franklin IT is unable to provide VMs for this course

  ‣ Download/install the following:

    ☐ Virtual Box (https://www.virtualbox.org)

    ☐ Ubuntu 24.04 LTS ISO

  ‣ Create an Ubuntu VM on your own machine

  ‣ Develop and test your code within the Ubuntu VM

‣ Projects must be developed/tested on the VM

‣ Grading will happen on a similar VM to avoid dependency issues

‣ Start getting familiar with

  ‣ ssh, tmux, wireshark, tshark, tcpdump, telnet, nc (netcat), ping, traceroute, curl, git, etc…

  ‣ We'll be using Python 3.8+ with Scapy and other modules

  ‣ C will be the required language for some of the projects

Exams (45%)

▸ Midterm Exams
  ▸ Will cover all topics discussed up to ~ one week before the exam

▸ Final Exam
  ▸ May cover **all topics**
  ▸ Main focus on last part of the course

▸ Both Midterms and Final may also contain some questions related to papers assigned for review/presentation

Overall Grade

- Weighted sum of all points

  - $S = 100*(\ 0.10*p/P + 0.45*d/D + 0.45*e/E\ )$
    - S >= 95% = A   S >= 90% = A-
    - S >= 85% = B+   S >= 80% = B
    - S >= 75% = B-   S >= 70% = C+
    - S >= 60% = C   S >= 50% = C-
    - S >= 40% = D   S < 40% = F

  - p = overall presentation points (max: P)
  - d = overall project development points (max: D)
  - e = sum of all exam points (max: E)

Other info

- Communications
  - The full Syllabus will be on eLC
  - Most communications will happen via eLC
  - Assignments info and deadlines will be posted on eLC
  - Submissions will happen through eLC
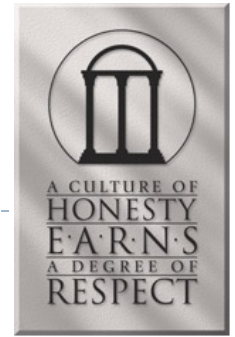   - Details will be provided along with assignments description

Logistics

- As a reminder… Classes are on
  - Tuesday and Thursday: 2:20pm-3:35pm
  - Wednesday: 3pm-3:50pm
  - All classes in GSRC 222

- Office hours
  - Dr. Perdisci: Tue and Thu, 3:35-4:35pm
    - let me know in advance, via email, if you need to speak to me during the above office hours

Academic Integrity

▸ Every student must abide by UGA's **academic honesty policy**

▸ Dishonest behavior including cheating, copying, or forging experimental results **will not be tolerated** and will be reported according to UGA's policies

▸ Specific to Development Projects:
  ▸ You are *allowed* to search for examples of network programming and related documentation
  ▸ You are *not allowed* to reuse other people's code (no cut and paste!)
    ▸ Use examples to understand how the code works and then **write your own code**

Mental Health and Wellness Resources

▸ If you or someone you know needs assistance, you are encouraged to contact Student Care and Outreach in the Division of Student Affairs at 706-542-7774 or visit https://sco.uga.edu.
They will help you navigate any difficult circumstances you may be facing by connecting you with the appropriate resources or services. UGA has several resources for a student seeking mental health services or crisis support.
If you need help managing stress anxiety, relationships, etc., please visit BeWellUGA for a list of FREE workshops, classes, mentoring, and health coaching led by licensed clinicians and health educators in the University Health Center.

Additional resources can be accessed through the UGA App.

Questions?