Course Syllabus

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Instructor Information [Top]

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Office: Fred Brooks (FB) room 112

Office hours: MW 2 to 3 pm or by appointment via CourseCare

Meeting Information [Top]

Chapman Hall, Room 0211, TTH: 11:00 AM-12:15 PM

Description [Top]

This is the first course (in a two-course introductory systems sequence, i.e., COMP 211 and COMP 311) that will introduce students to the design of computer systems. The major topics covered in this course include data representation, programming concepts including pointers, compilation system and execution models, memory organization and management, process models, input/output and redirection, and basic operating system design. Students will also be exposed to command-line interface tools in a Linux environment, including shell, editor, compiler, version control, and build tools. Canvas will be the primary means for distributing information such as lecture slides and videos, graded assignments, reporting scores, announcements, etc.

Students enter the course having already taken an introductory programming course in a high-level programming language (COMP 210) and a course in discrete structures (COMP 283 or MATH 381). The overarching goal is to bridge the gap between a student's knowledge of a high-level programming language (COMP 210) and computer organization (COMP 311).

Prerequisites [Top]

COMP 210, COMP 283, or MATH 381 (a grade of C or better is required in both prerequisite courses.)

Key Learning Objectives [Top]

1. fundamental concepts of systems programming using C language,
2. basic design and operation of the compilation system and execution model,
3. basic design and operation of memory (physical and virtual), and
4. basic design principles of an operating system (process model and scheduling).

Computing Requirements [Top]

To take this course, we **expect** your laptop to meet the **Carolina Computing Initiative (https://cci.unc.edu/new-students/minimum-laptop-requirement/)** standards. If your laptop does not meet the Carolina Computing (CC) standard, then you have two options:

1. purchase a laptop computer that meets the CC standard **before** the course starts or
2. drop the course and complete it in a future semester.

Unfortunately, the Comp 211 team does not have the resources to help solve UNC-mandated computing requirement problems or find/support alternative options.

Operating System Requirements [Top]

In this course, you'll write software programs using the C programming language in the Linux operation system (OS) environment. To achieve this goal, you must be able to install the Docker Desktop (or Docker for short) software application on your laptop. To install Docker, your OS must meet the minimum system requirements below.

- If your laptop runs the Windows OS, you must meet the **Windows system requirements (https://docs.docker.com/desktop/install/windows-install/)** .
- If your laptop runs the Mac OS, you must meet the **Mac system requirements (https://docs.docker.com/desktop/install/mac-install/)** .

If you're unable to meet the OS system requirements to install Docker, you have two options:

1. update your OS, so it meets the Docker system specification or
2. drop the course and complete it in a future semester.

Unfortunately, the Comp 211 team does not have the resources to help purchase or install OS upgrades on personal computers or find/support alternative computing options.

Our best advice is that **UNC ITS (https://its.unc.edu/)** can assist in purchasing a computer and upgrading your OS to meet the minimum system requirements for this course.

Grading [Top]

Criteria and Weighting

- Lab Assignments: 25%
- Project: 5%
- Quizzes: 15%
- Exam I: 15%
- Exam II: 15%
- Final Exam: 25%

Lab Assignments: 8 to 10 lab assignments will develop programs using the C programming language. Unless otherwise stated, labs are individual assignments (i.e., not group assignments where you can work collaboratively with other students). Lab assignments are available through GitHub and will be submitted to Gradescope to receive a grade. Unless otherwise stated, typically, you'll be given one week to complete the lab assignment. The lab due date will be announced at the beginning of the lecture, and the schedule will be updated. Regrade requests will only be accepted for the 72 hours following grade release.

Quizzes: We'll have 8 to 10 quizzes that cover material in lectures, reading assignments, or lab assignments. The quiz will be online through Canvas and timed (e.g., 15 minutes to complete). The online quiz will be available to take over a fixed number of days (e.g., you can take the quiz over the weekend). The quiz's due date will be announced at the beginning of the lecture, and the schedule will be updated. Quizzes are open notes and course textbooks unless otherwise stated. Regrade requests will only be accepted for the 72 hours following grade release.

Exams: Exams will be online through Canvas and timed (e.g., 1 hour and 15 minutes to complete). Exams are closed everything (e.g., book, notes, etc.) unless otherwise stated. The online exam will be given at the beginning of class, and the exam dates will be added to the schedule. Regrade requests will only be accepted for the 72 hours following grade release.

Project: There will be one project that will be assigned near the end of the semester. The project will be an individual assignment (i.e., not a group assignment where you can work collaboratively with other students). The project is available through GitHub and will be submitted to Gradescope to receive a grade. Unless otherwise stated, typically, you'll be given two weeks to complete the project. The project's due date will be announced at the beginning of the lecture, and the schedule will be updated. Regrade requests will only be accepted for the 72 hours following grade release.

Final Exam: The final exam will be administered on the **final exam date (https://registrar.unc.edu/academic-calendar/final-examination-schedule-fall/)** determined by the University. This will be a comprehensive exam that will include all the material covered in the course. Unless otherwise stated, the final exam will be closed everything (e.g., book, notes, etc.).

Grade Scale [Top]

According to the scale below, your final grade percentage will be converted to a letter grade. Note: the instructor reserves the right to adjust the scale if the grades are too low.

Letter Grade	Percentage
A	95–100%
A-	90–94%
B+	86–89%
B	83–85%
B-	80–82%
C+	76–79%
C	73–75%
C-	70–72%
D+	65–69%
D	60–64%
F	0–59%

Policies [Top]

Attendance: No right or privilege exists that permits a student to be absent from any class meetings, except for these **University Approved Absences (https://uaao.unc.edu/)** (UAA):

- Authorized University activities
- Disability/religious observance/pregnancy, as required by law and approved by **Accessibility Resources and Service (https://ars.unc.edu/)** and/or the **Equal Opportunity and Compliance Office (https://eoc.unc.edu/what-we-do/accommodations/)** (EOC)
- Significant health condition and/or personal/family emergency as approved by the **Office of the Dean of Students (https://dos.unc.edu)**, **Gender Violence Service Coordinators (https://womenscenter.unc.edu/resources/gender-violence-services/)**, and/or the **Equal Opportunity and Compliance Office (https://eoc.unc.edu/what-we-do/accommodations/)** (EOC).

Lab/Project: After the due date for a lab/project has passed, you have an opportunity to submit for partial credit. Specifically,

- if a solution is submitted after the due date/time but before the late due date/time (both dates/times will be clearly defined on the Gradescope assignment), then a 25% reduction will be applied to your score, i.e., penalty score = score - (score * 0.25). It is your responsibility to understand how the late penalty is applied, and no excuses will be accepted or exceptions will be made.
- If a solution is submitted after the posted **late due date/time**, the lab/project will not be accepted and scored. No exceptions will be made for out-of-town trips, job interviews, computer crashes, mild sickness, etc. If you have a UAA (see attendance policy above) from the Dean of Students, an extension will be provided (note: the extension length depends on the absence's seriousness).

Drops: To allow for situations that arise from time to time that hinder a student's ability to (1) turn in a lab on time or (2) miss a quiz, the following scores will be dropped:

- the lowest lab score, and
- the lowest quiz score.

Canvas has been configured to apply the above drop policy automatically.

Quiz: Because the quiz is open over several days, if a quiz is missed or the submission instructions are not followed, no makeup quiz will be given, no exceptions. To offset this, the lowest quiz score will be dropped (see Drop policy above).

Exam Policy: Without a UAA (see attendance policy above) from the Dean of Students, no extension will be provided, and there will be no exceptions. If an extension is given, the scheduled makeup exam will be administered by the **Undergraduate Testing Center (http://testingcenter.web.unc.edu/)** .

References [Top]

Required Textbooks (Resource/Textbooks folder)

- **Computer Systems: A Programmer's Perspective (https://uncch.instructure.com/users/9947/files/4526297?verifier=GsaGSp6QkNQvZGMOCCiuAT4eyRWq70bxlKOgxjZr&wrap=1) (https://uncch.instructure.com/users/9947/files/4526297/download?**

verifier=GsaGSp6QkNQvZGMOCCiuAT4eyRWq70bxlKOgxjZr&download_frd=1) (CSApp)

- C Programming Language (https://uncch.instructure.com/users/9947/files/4526296?verifier=bzWbUsKclOVAAJ7MfuwOyS5v8DDILep0R7HtGh7t&wrap=1) (https://uncch.instructure.com/users/9947/files/4526296/download?verifier=bzWbUsKclOVAAJ7MfuwOyS5v8DDILep0R7HtGh7t&download_frd=1) (CProg)
- Operating System Concepts (https://uncch.instructure.com/users/9947/files/4526298?verifier=FnaqdJAQUPWlDvxcd6jgGnvDHLOiJRlWe3JUFMJ2&wrap=1) (https://uncch.instructure.com/users/9947/files/4526298/download?verifier=FnaqdJAQUPWlDvxcd6jgGnvDHLOiJRlWe3JUFMJ2&download_frd=1) (OSC)
- Computer Organization and Design (https://uncch.instructure.com/users/9947/files/4526295?verifier=5fSYt4PL0PNPCaKm2a1NWbUir9RqnTJh8OMbgG2O&wrap=1) (https://uncch.instructure.com/users/9947/files/4526295/download?verifier=5fSYt4PL0PNPCaKm2a1NWbUir9RqnTJh8OMbgG2O&download_frd=1) (COD)
- Operating Systems: Three Easy Pieces (https://pages.cs.wisc.edu/~remzi/OSTEP/) (OSTEP)

Supplemental Reading (Resource/Supplemental folder)

- Learn a Command-line Interface: Basic Shell Commands (Chapter 1) (https://uncch.instructure.com/users/9947/files/4534606?verifier=OtzqqS8AJ9vtBgYkQDnjzhdQCkb6fk4YT47bMMXA&wrap=1) (https://uncch.instructure.com/users/9947/files/4534606/download?verifier=OtzqqS8AJ9vtBgYkQDnjzhdQCkb6fk4YT47bMMXA&download_frd=1)
- Learn a Command-line Interface: Directories, Files, and Paths (Chapter 2) (https://uncch.instructure.com/users/9947/files/4534607?verifier=Ay7tjnpmx7Cdhg7TzNXg7zfPD6wbBhBJOy8NqWXK&wrap=1) (https://uncch.instructure.com/users/9947/files/4534607/download?verifier=Ay7tjnpmx7Cdhg7TzNXg7zfPD6wbBhBJOy8NqWXK&download_frd=1)
- Linux command line tutorial (https://uncch.instructure.com/users/9947/files/4534608?verifier=ZTQdtnM3B2YMB00i0Syd6Ugh6S25rHgxUb2k8U4k&wrap=1) (https://uncch.instructure.com/users/9947/files/4534608/download?verifier=ZTQdtnM3B2YMB00i0Syd6Ugh6S25rHgxUb2k8U4k&download_frd=1) (Comprehensive Guide)

Online Resources (recommended)

- VIM command-line text editor tutorials (https://www.youtube.com/playlist?list=PLKUb7MEve0Tj3MLYDIyYplZtnJehmlR0s)

- C programming tutorial (https://www.tutorialspoint.com/cprogramming/index.htm)
- C standard library reference (https://www.tutorialspoint.com/c_standard_library/index.htm) (Very similar to Java API)
- Linux manual pages (https://man7.org/linux/man-pages/index.html) (man pages)
- Git command reference (https://www.atlassian.com/git/tutorials/atlassian-git-cheatsheet) (cheat sheet)

Counseling and Psychological Services (CAPS) [TOP]

UNC-Chapel Hill is strongly committed to addressing the mental health needs of a diverse student body. The Heels Care Network (http://care.unc.edu/) website is a place to access Carolina's many mental health resources. CAPS is students' primary mental health provider, offering timely access to consultation and connection to clinically appropriate services. Go to their website https://caps.unc.edu/ (https://caps.unc.edu/) or visit their facilities on the third floor of the Campus Health building for an initial evaluation to learn more. Students can also call CAPS 24/7 at 919-966-3658 for immediate assistance.

Honor Code and Collaboration [TOP]

In order to do well in this course, you must come to your own individual understanding of the material. As such, collaboration is prohibited outside of the following policies. To achieve this level of understanding you are required to do your own work. Make sure that you are familiar with The UNC Honor Code (https://catalog.unc.edu/policies-procedures/honor-code/ (https://catalog.unc.edu/policies-procedures/honor-code/)). Not following these rules is a violation of the Honor Code. The bottom line is that if you have any questions about the honor policy or when in doubt, you must ask the instructor (in writing) for clarification.

Collaboration Policy on Ungraded, General Course Concepts: You absolutely may, and are encouraged to, discuss general course concepts (i.e., not assignment-specific) material with anyone, including other current students and tutors. This includes reviewing lecture slides, documentation, code examples covered in lectures, study guides, etc. The examples you use to discuss general course materials must be from lectures or your own creativity; you cannot use examples directly drawn from any assignments handed in.

Collaboration on Graded Work: No collaboration with peers inside the course or anyone outside the

course. Your ability to complete each individually is critical for your ability to do well in this course. Illegal collaboration is easily detected because Gradescope has built-in support for Stanford's MOSS program (Measures of Software Similarity) and other machine learning techniques. Every year, several violations are caught and prosecuted in the Honor Court. To avoid any fears, it is simple: work on assignments and assessments on your own and come to office hours when you have questions.

Accessibility Resources and Services (ARS) [TOP]

The University of North Carolina at Chapel Hill facilitates the implementation of reasonable accommodations, including resources and services, for students with disabilities, chronic medical conditions, a temporary disability or pregnancy complications resulting in barriers to fully accessing University courses, programs and activities. Accommodations are determined through the Office of Accessibility Resources and Service (ARS) for individuals with documented qualifying disabilities in accordance with applicable state and federal laws. See the ARS Website for contact information: **https://ars.unc.edu (https://ars.unc.edu/)** or email **ars@unc.edu (mailto:ars@unc.edu)** .

Diversity Statement [TOP]

I value the perspectives of individuals from all backgrounds reflecting the diversity of our students. I broadly define diversity to include race, gender identity, national origin, ethnicity, religion, social class, age, sexual orientation, political background, and physical and learning ability. I strive to make this classroom an inclusive space for all students. Please let me know if there is anything I can do to improve, I appreciate suggestions.

Title IX Resources [TOP]

Any student who is impacted by discrimination, harassment, interpersonal (relationship) violence, sexual violence, sexual exploitation, or stalking is encouraged to seek resources on campus or in the community. Reports can be made online to the EOC at **https://eoc.unc.edu/report-an-incident/ (https://eoc.unc.edu/report-an-incident/)** or by contacting the University's Title IX Coordinator (Elizabeth Hall, **titleixcoordinator@unc.edu (mailto:titleixcoordinator@unc.edu)**) or the Report and Response Coordinators in the Equal Opportunity and Compliance Office

(reportandresponse@unc.edu (mailto:reportandresponse@unc.edu)). Confidential resources include Counseling and Psychological Services and the Gender Violence Services Coordinators (gvsc@unc.edu (mailto:gvsc@unc.edu)). Additional resources are available at safe.unc.edu (https://safe.unc.edu/) .

Disclaimer [TOP]

The instructor reserves the right to change the syllabus, including assignment and exam due dates. These changes will be announced as early as possible. Lastly, course content beyond the current week may change without notice to enhance the learning process. Feel free to look ahead but remember that changes may occur before a particular week is current.