CSCI 200: Foundational Programming Concepts & Design
Spring 2025 Syllabus
https://cs-courses.mines.edu/csci200/index.html

Course Description

This course teaches students C++, how to manage memory properly & efficiently at run time, the principles of object-oriented programming, and how to create an algorithm using data structures & abstraction to solve a problem. Recursive data structures & algorithms will be constructed & analyzed when solving problems. Initial principal components of software engineering and design will be introduced and used when drafting a solution to a problem. Programs will be developed using a command line interface.

Course Learning Outcomes

By the end of this course, students will be able to:

- Design an algorithm to solve a problem by breaking the overarching problem into smaller modular components using abstraction and object-oriented design with inheritance.
- Translate the algorithm into a program using proper C++ syntax and fundamental programming constructs (e.g. control structures, I/O, classes).
- Recite & apply frequently used Linux command line commands and compile a program using a command line build system.
- Diagram memory usage, dynamically allocate & deallocate objects at run-time using "The Big Three," and trace the call stack of a program's run-time.
- Define recursion and construct common recursive data structures (e.g. linked list, stack, queue) & algorithms (e.g. search & sort).
- Diagram & construct dynamically allocated data structures (e.g. array, vector, string), recursive data structures, (e.g. linked list, stack, queue), and implement common list operations (e.g. traversal, insertion, removal).
- Define "Big-O" notation, list complexities in increasing order, and analyze an algorithm to compute its run-time performance & memory complexities.

Student Course Evaluation

The final course grade will be computed from the following course percentage breakdown:

- 5% Engagement
- 27.5% Assignments + Labs
- 7.5% Final Project
- 10% Quizzes
- 25% Midterm Exams I & II
- 25% Final Exam

Final grades will be determined using a straight scale. The straight scale assigns letter grades as follows:

- [93, 100] -- A
- [90, 93) -- A-
- [87, 90) -- B+
- [83, 87) -- B
- [80, 83) -- B-
- [77, 80) -- C+
- [73, 77) -- C
- [70, 73) -- C-
- [67, 70) -- D+
- [63, 67) -- D
- [60, 63) -- D-
- [0, 60) -- F

Computing Standard for Assignment Submissions

While there exist many compilers and IDEs, it is possible your code and solution may work in one environment but not another. All submissions will be graded against g++ on Windows (to match the lab environment). The specific build environment will be detailed in class. It is your responsibility to ensure your submission works in the lab environment. If your submission does not compile or work with g++ and Windows in the lab environment, the grader will make a good faith effort to correct the error. If the grader cannot quickly correct the error, the grader will contact you once providing you 24 hours to correct your submission.

You need to take the following steps to help ensure cross-platform compatibility of your submission:

- Do not hard code the absolute path to any file. Always use a relative path and include the dependent file with your submission.
- Do not include any OS specific or compiler specific libraries (e.g. `windows.h` or `bits/stdc++.h`).
- If your final project uses a third-party library, then the library source must be submitted with your project submission. Your project must be able to build via the `make` command.

Lab / Assignment Submission Policy

- All labs are due at the beginning of class on the date stated.
- All assignments are due at 11:59PM on the date stated.

To receive full credit for any lab or assignment, the submission must be on time, unless an approved absence is submitted. Submissions will be accepted for an additional 72 hours beyond the date stated. Any tasks missed due to excused absences must be completed after consultation with the instructor.

For a discrepancy in any grade in which you think you deserve more points than you received, you must raise the issue within one week of the day the item was returned. No claims, justifiable or not, will be considered after this deadline. For discrepancies with assignments, you must contact the grader and the course coordinator via email.

After lab/assignment grades and feedback have been returned, students are permitted one week to make corrections to the lab/assignment and resubmit the lab/assignment. Up to half of the points deducted for the lab/assignment can be earned back on the second submission. Additional details and specifications will be given in class.

Collaboration Policy for Programming Assignments & Projects

We follow the Colorado School of Mines Student Honor Code and Policy on Academic Integrity. Work submitted for grading should not be derived from work of others. The programming assignments are an integral part of the Computer Science learning experience. These projects will be fun, challenging, illuminating, time consuming, frustrating, and rewarding. Your sense of pride upon finishing is well deserved and your efforts earn your powerful skills and deep understanding. Don't cheat yourself out of this opportunity!

The Honor Code is a powerful community statement that asserts our shared values of integrity. This is a community we are committed to be a part of – please join us! Below are some additional guidelines that apply to CS courses. However, in every course, the instructor has the final say about expectations of academic honesty.

There are various ways to use a resource for assigned work and we distinguish them in two ways:

- **What kind of source is it?** Is it a general resource that you are drawing on to do the assigned work, or is it a solution to the assigned work? Does the resource trivialize the assigned task?
- **How is the source used?** Do you consult the source, or do you copy from it more or less verbatim?

For the full CS Departmental Collaboration Policy, visit:
http://cs-courses.mines.edu/csci200/resources/docs/CollaborationPolicy.pdf

Academic Code of Honor

- All students are expected to follow the University's Academic Code of Honor.
- A student or assigned team working on a program may discuss high-level ideas with other students or teams. However, at time of submission all work submitted **must be his/her/their own work**.
- Use of the Internet as a reference is allowed but directly copying code or other information is **cheating**. It is cheating to copy, allow another person to copy, all or part of an exam or a project, or to fake program output. It is also a violation of the Code of Honor to observe and then fail to report academic dishonesty. *You* are responsible for the security of your own work.
- We will provide, as part of the course, functional code examples for most of the topics covered. While you are encouraged to examine these examples, your submissions must represent a good-faith effort to complete the assignment. Merely copying and pasting code from the examples will result in a failing grade. Furthermore, relying too heavily on the given examples will fail to prepare you for the much more open-ended final project.
- Developing a program is a creative exercise; just like in art, no two programs will look exactly the same (unless the "canvas" has been copied). To ensure copying does not exist, homework assignments are checked via an automated system that generates similarity metrics between your work and that of all other students and previous student work in this class. When a high-level of similarity is detected, the course coordinator is notified and investigates the similarity. If plagiarism is evident, the course coordinator begins the process of submitting an Academic Misconduct.

Disclaimer

This syllabus is intended to give the student guidance in what may be covered during the semester and will be followed as closely as possible. However, the professor reserves the right to modify, supplement and make changes as the course needs arise. Any changes will be communicated in an appropriate and timely fashion.

Mines Policies and Resources

Diversity and Inclusion: At Colorado School of Mines, we understand that a diverse and inclusive learning environment inspires creativity and innovation, which are essential to the engineering process. We also know that in order to address current and emerging national and global challenges, it is important to learn with and from people who have different backgrounds, thoughts, and experiences. Our students represent every state in the nation and more than 90 countries around the world, and we continue to make progress in the areas of diversity and inclusion by providing Diversity and Inclusion programs and services to support these efforts.

Disability Support Services: The Colorado School of Mines is committed to ensuring the full participation of all students in its programs, including students with disabilities. If you anticipate or experience any barriers to learning in this course, please feel welcome to discuss your concerns with me. Students with disabilities may also wish to contact Disability Support Services (DSS) to discuss options to removing barriers in this course, including how to register and request official accommodations. Please visit their website for contact and additional information. If you have already been approved for accommodations through DSS, please meet with me at your earliest convenience so we can discuss your needs in this course.

Accessibility within Canvas: Read the Accessibility Statement from Canvas to see how the learning management system at the Colorado School of Mines is committed to providing a system that is usable by everyone. The Canvas platform was built using the most modern HTML and CSS technologies, and is committed to W3C's Web Accessibility Initiative and Section 508 guidelines.

Discrimination, Harassment, and Title IX: All learning opportunities at Mines, including this course, require a safe environment for everyone to be productive and able to share and learn without fear of discrimination or harassment. Mines' core values of respect, diversity, compassion, and collaboration will be honored in this course, and the standards in this class are the same as those expected in any professional work environment. (More information can be found here.) Discrimination or harassment of any type will not be tolerated. As a participant in this course, we expect you to respect your instructor and your classmates. As your instructor, it is my responsibility to foster a learning environment that supports diversity of thoughts, perspectives and experiences, and honors your identities. To help accomplish this: (1) Course rosters are provided to the instructor with the student's legal name. I will honor your request to address you by a preferred name or gender pronoun. Please advise me of this preference early in the semester so that I may make appropriate changes to my records.
(2) If something is said or done in this course (by anyone, including myself) that made you or others feel uncomfortable, or if your performance in the course is being impacted by your experiences outside of the course, please report it to me (if you are comfortable doing so), to the Wellness Center/Counseling, and to Speak Up (an anonymous option). In this course, we will cultivate a community that supports survivors, prevents interpersonal violence, and promotes a harassment free environment. Title IX and Colorado State law protects individuals from discrimination based on sex and gender in educational programs and activities. Mines takes this obligation seriously and is committed to providing a campus community free from gender and sex-based discrimination. Discrimination, including sexual harassment, sexual violence, dating violence, domestic violence, and stalking, is prohibited and will not be tolerated within the Mines campus community. If these issues have affected you or someone you know, you can access the appropriate resources here: http://www.mines.edu/title-ix/. You can also contact the Mines Title IX Coordinator, Camille Torres, at 303.384.2124 or titleix@mines.edu for more information. It's on us, all of the Mines community, to engineer a culture of respect.

CARE @ Mines: If you feel overwhelmed, anxious, depressed, distressed, mentally or physically unhealthy, or concerned about your wellbeing overall, there are resources both on- and off-campus available to you. If you need assistance, please ask for help form a trusted faculty or staff member, fellow student, or any of the resources below. As a community of care, we can help one another get through difficult times. If you need help, reach out. If you are concerned for another student, offer assistance and/or ask for help on their behalf. Students seeking resources for themselves or others should visit care.mines.edu. Additional suggestions for referrals for support, depending on comfort level and needs include: (1) CARE at Mines: for various resources and options, or to submit an online "CARE report" about someone you're concerned about, or email care@mines.edu. (2) CASA for academic advising, tutoring, academic support, and academic workshops. (3) Counseling Center (303-273-3377) to make an appointment or for online resources for students on the website. Located in the Wellness Center 2nd floor. Located at 1770 Elm St. (photo below). (4) Health Center (303-273-3381) for an appointment, located in the Wellness Center 1st floor. (5) Colorado Crisis Services - For crisis support 24 hrs/7 days, either by phone, text, or in person, Colorado Crisis Services is a great confidential resource, available to anyone. Also call 1-844-493-8255, or text "TALK" to 38255. Walk-in location addresses are posted on the website. (6) Food and/or Housing - Any student who faces challenges securing their food or housing and believes this may affect their performance in the course is urged to contact the Dean of Students for support. Furthermore, please notify your professor if you are comfortable in doing so. This will enable your professor to provide resources that may be available. All of these options are available for free for students. The Counseling Center, Health Center, and Colorado Crisis Services are confidential resources. The Counseling Center will also make referrals to off-campus counselors, if preferred. In an emergency, you should call 911, and they will dispatch a Mines or Golden PD officer to assist.

Absence Policy: The Student Absences webpage outlines CSM's policy regarding student absences. It contains information and documents to obtain excused absences. All absences that are not documented as excused absences are considered unexcused absences. Faculty members may deny a student the opportunity to make up some or all of the work missed due to unexcused absence(s). However, the faculty members do have the discretion to grant a student permission to make up any missed academic work for an unexcused absence. The faculty member may consider the student's class performance, as well as their attendance, in the decision. In the case of an absence, the student is responsible for determining what work was missed and for putting forth a good faith effort to review the material on their own.

Policy on Academic Integrity/Misconduct: The Colorado School of Mines affirms the principle that all individuals associated with the Mines academic community have a responsibility for establishing, maintaining and fostering an understanding and appreciation for academic integrity. In broad terms, this implies protecting the environment of mutual trust within which scholarly exchange occurs, supporting the ability of the faculty to fairly and effectively evaluate every student's academic achievements, and giving credence to the university's educational mission, its scholarly objectives and the substance of the degrees it awards. The protection of academic integrity requires there to be clear and consistent standards, as well as confrontation and sanctions when individuals violate those standards. The Colorado School of Mines desires an environment free of any and all forms of academic misconduct and expects students to act with integrity at all times. Academic misconduct is the intentional act of fraud, in which an individual seeks to claim credit for the work and efforts of another without authorization, or uses unauthorized materials or fabricated information in any academic exercise. Student Academic Misconduct arises when a student violates the principle of academic integrity. Such behavior erodes mutual trust, distorts the fair evaluation of academic achievements, violates the ethical code of behavior upon which education and scholarship rest, and undermines the credibility of the university. Because of the serious institutional and individual ramifications, student misconduct arising from violations of academic integrity is not tolerated at Mines. If a student is found to have engaged in such misconduct sanctions such as change of a grade, loss of institutional privileges, or academic suspension or dismissal may be imposed. The complete policy can be found in the Mines' Policy Library.