CSCI 441 - Computer Graphics
Fall 2021
Syllabus

Instructor:
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Lectures: Mondays & Wednesdays 1:00 PM – 1:50 PM   Alderson Hall 340
Labs: Fridays 1:00 PM – 1:50 PM   Marquez Hall 022

Recommended Textbooks:
>1) OpenGL Programming Guide, 9th ed., John Kessenich, Graham Sellers, Dave Shreiner, 2017.
>2) OpenGL 4 Shading Language Cookbook, 3rd ed., David Wolff, 2018.
>3) OpenGL Quick Reference API Version 4.6, Khronos Group, 2017.
>
>Other resources will be posted on the website.

Website:
>https://cs-courses.mines.edu/csci441/index.html

Assignments:
- There will be five **individual** programming assignments throughout the semester. Due dates will be specified and are firm. Individual programming assignments **must** represent individual student work.
- If your program requires input from a data file or the user, you **must** include sample data files or input with the submission.
- All programs (homework assignments, programs, projects, labs) must be submitted in electronic form through Canvas.
- Every submission must include a README file which describes how to build and run the assignment. Any other information that is required to run the program should be included here as well.
- Your goal should be to make it easy for us to see how great you did. If we make a couple of good faith attempts but fail to get your program running, we will try once to contact you to help us. If we still cannot get your work to compile, it will receive a zero grade.

Late Policy:
- All assignments and projects are due at the date and time specified on the item handout.
- Items received less than 24 hours past the due date will receive a 10% grade reduction.
- Items received greater than 24 hours but less than 48 hours past the due date will receive a 20% grade reduction.
- Items received greater than 48 hours but less than 72 hours past the due date will receive a 30% grade reduction.
- Items received greater than 72 hours past the due date will receive a 50% grade reduction.

Projects:
- There will be two course projects, to be completed in teams of three. The first will be a midterm project due shortly before Fall Break. The second will be a final project due during the last week of class.
- In addition to the programming project, each team will give a brief presentation showcasing their project.
- All code and files required for the projects must be submitted to the team's Canvas page.

Labs:
- Each week there will be a laboratory session that will cover the new techniques discussed in lecture each week. The lab assignments will be due by the end of the day each following Friday, giving you a full week to complete the lab.
- The lab assignments are intended to be done during the class time but may require time after the lab session.
- The assignments will build off of the labs so use the labs as a starting point for your assignments.
- Initially, labs will be individual assignments. As the semester progresses, it will be possible to work together on labs. Refer to each lab specific assignment for the corresponding collaboration policy.

Exams:
- There will be two exams during the semester.
- Make-up exams will be allowed only in accordance with University policy. Make-up exams resulting from illness require notification (email is fine) the day of the exam and a doctor's note when well. Make-up exams due to legitimate travel require advance notice and instructor's approval.

Grading:
The final course grade will be computed from the following course percentage breakdown:
- 30% Homework Assignments
- 15% Labs
- 10% Midterm Project
- 15% Final Project
- 10% Exam I
- 10% Exam II
- 10% Participation & Hero Level

There will be multiple opportunities for extra credit throughout the course, including extra credit sections on various homework assignments and projects, extra credit questions on the midterm exam, and extra credit assignments.

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

Discrepancies:
- If you have any questions regarding how any assignment, project, or exam is graded and you think you deserve more points than you received, you must see the grader within **one week** of the day the item was returned to class. No claims, justifiable or not, will be considered after this deadline. If you and the grader cannot reach a consensus, then contact the instructor.
- Any assignment returned to the instructor is subject to total re-grading. Note: it is technically possible that this regrade may be lower than your initial score.

Participation:
- A portion of the student's grade will be comprised of in-class and online participation.
- After the first week of class, students are expected to participate by making regular forum posts, either asking a question or responding to an existing topic. From time to time, there may be specific discussion topics.
- Regular course attendance is mandatory. If attendance is low, the instructor reserves the right to administer pop quizzes for credit, to be determined.
- During the course, you will create a hero and bring this hero to life. As the course progresses, your hero will become more powerful and level up. In order to level up, your hero will need to earn experience points (XP). There are many ways to earn XP. See the next section on how to earn XP.

Achievement System
- As you complete assignments and labs you will earn XP for your hero. Each assignment will have a number of achievements you can earn by adding various features to your program. Some of these achievements will be hinted at for you to discover, others will be explained as extra credit, and a last set will be hidden for you find on you own. Earning an achievement will also award your hero with XP.
- *What if I miss an achievement on an assignment?* If after submitting an assignment you find out you did not earn an achievement, then you will be permitted to go back and attempt to earn the achievement. Each student will be allowed **ONE RESUBMISSION** of the assignment at any point in the semester. This resubmission **will not be regraded**, i.e. your grade for the assignment will not be recomputed or altered. However, if you satisfy the requirements for an achievement then you will earn the achievement and the associated XP.
- At the end of the semester, the instructor will award up to 500 bonus XP for exemplary attendance, participation in class, etc. If you participate regularly and come to class, this could be enough to get you up a level and over the hump to the next letter grade.

- XP required to level up:

Level	XP		Level	XP
1	250		11	4500
2	500		12	5000
3	750		13	5500
4	1000		14	6000
5	1250		15	6500
6	1500			
7	2000			
8	2500			
9	3000			
10	4000			

- Hopefully you noticed that your hero can reach Level 15, which will earn you 15 participation points. Since participation counts for 10% of your overall grade, this is your opportunity to earn extra credit throughout the semester (a max of 5 bonus points to your overall semester grade).

Piazza
- Be polite. This also applies to assignment clarifications (e.g. writing "This requirement makes no sense" may not be the best phrasing. Try something like: "I'm not clear what requirement X means. Should I do [x] or [y]?")
- A Piazza post is not a text message; use complete sentences and correct spelling, punctuation, and grammar.
- When asking a question, do not post large blocks of code. A single line of code, to clarify your question, may be appropriate. Before posting, ask yourself: would this be giving most of the answer to another student? Thinking about how to phrase the question may help you solve the problem.
- Achievement Unlocked! You are doing a rather thorough reading of the syllabus. Email the professor with the subject line "I See All" to earn the Eye of Sauron achievement.
- When answering a question, do not post the exact code from your homework solution. Possible exception would be something that takes one line and is primarily a syntax question. E.g., to a question like "How do I set the color of my rectangle" you might answer with something like "You need to set the color before drawing. If g is a Graphics object, you can do g.setColor(Color.CYAN);".
- Using pseudocode is an **excellent** way to answer questions.

Computing:
- This class will involve extensive use of OpenGL and GLFW. You may use any platform to develop your program. We will provide CLion Projects to aid with the compilation on most systems.
- In general, OpenGL / GLFW code that compiles and executes correctly will perform correctly on any other machine on which it compiles. However, certain elements of OpenGL and GLSL are less-standardized. **For this reason, it is important that you test your code on the lab machines in Marquez Hall 022 prior to submitting.** This will become more important in the second half of the semester when we cover more advanced techniques and shader programming. If we have trouble getting any of your GLSL code to run properly we will contact you once for assistance.

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/csci261/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 theWellness 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.