

CSCI 444 / 544 – Advanced Computer Graphics

Spring 2021

Syllabus

Instructor:

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Office Hours: TBD, or by appointment

Class Time:

MWF 1:00 – 1:50 pm

Required Textbook:

OpenGL 4 Shading Language Cookbook, 3rd ed., David Wolff, 2018.

Suggested Textbooks:

OpenGL Programming Guide, 9th ed., John Kessenich, Graham Sellers, Dave Schreiner, 2018.
OpenGL Quick Reference API Version 4.6, Khronos Group, 2017.

Other resources will be posted on the website.

Website:

<https://cs-courses.mines.edu/csci444/index.html>

Assignments:

- There will be **individual** programming assignments throughout the semester. Due dates will be specified and are firm. Individual programming assignments **must** represent individual student work.
- 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 me to see how great you did. If I make a couple of good faith attempts but fail to get your program running, I will try once to contact you to help. 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 less than 48 hours past the due date will receive a 20% grade reduction.
- Items received less than 72 hours past the due date will receive a 30% grade reduction.
- Items received more than 72 hours past the due date will receive a 50% grade reduction.

Project:

- There will be one semester long project, to be completed in teams. Teams must be comprised of two students registered at the same level (444 or 544).
- The purpose of this project is to allow the students to pursue a focused topic more in depth than could be covered in the course. Each team will have a different topic they are working on.
- In addition to the programming project, each team will:
 - Give an in-class lecture explaining the topic they are researching.
 - Give an in-class demo showcasing their final project.
 - Write up a final report summarizing their results.
 - **For students registered in CSCI 544**, you will need to create a conference ready paper that could be potentially submitted to a leading computer graphics conference.
- All code and files required for the projects must be submitted to one of the team's account in Canvas.

Exam:

- There will be one in-class exam during the semester.
- A make-up exam will be allowed only in accordance with University policy.

Grading:

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

- | | |
|-------------------------------|-------------------------------|
| • CSCI 444 | • CSCI 544 |
| ○ 30% Programming Assignments | ○ 20% Programming Assignments |
| ○ 5% Labs | ○ 5% Labs |
| ○ 30% Final Project | ○ 35% Final Project |
| ○ 10% Final Report | ○ 12.5% Final Report |
| ○ 10% Presentation | ○ 12.5% Presentation |
| ○ 10% Exam | ○ 10% Exam |
| ○ 5% Participation | ○ 5% Participation |

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 |

Participation:

- A portion of the student's grade will be comprised of in-class and online participation.
- 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.
- You are expected to read the assigned reading **prior** to the start of class.

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 contact the instructor within **one week** of the day the item was returned. No claims, justifiable or not, will be considered after this deadline.
- Any assignment returned by the instructor is subject to **one** total re-grading.

Computing:

- This class will involve use of OpenGL / OpenGL ES / WebGL. You are free to use any of the three that you prefer as long as it supports the components we are discussing at the time. The computers on campus will meet your need for OpenGL. Marquez 022/026 are known to be compatible due to their graphics cards and available via remote desktop. It is recommended that you set up your own personal computer to mimic this build environment so you can work at your convenience outside of the lab (this is recommended if your machine supports OpenGL 4.0+). Tutorials will be provided to aid in your setup.

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.
- 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.

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 from 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](#).