Here's What You Need to Know About CS 450/550

**"Computer Graphics is the world's #1 enabling technology.
It doesn't matter who you are or how you got here.
Computer Graphics is for *everyone*!" -- Mike Bailey**

Oregon State
University

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IntroToCS450-550.pptx

Mike Bailey

- Professor of Computer Science, Oregon State University

- Has been in computer graphics for over 30 years

- Has had almost 12,000 students in his university classes

- mjb@cs.oregonstate.edu

Kelley Engineering Center at Oregon State University, home of CS

Welcome! I'm happy to be here. I hope you are too !
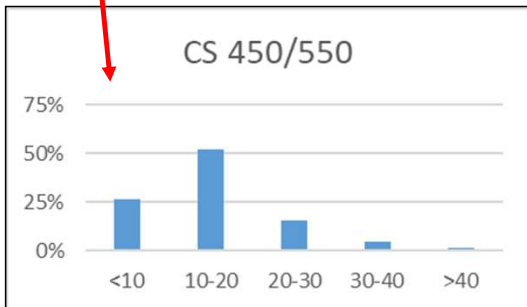
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I Apologize in Advance for What Noise You Might Hear in my Background at Home 😊

Concerns Taken from the Pre-Quarter Qualtrics Survey, I

You're concerned with the workload
This is the summary of what several years of this class have told me about the hours/week workload.

You don't like having to commute 2 hours each day for class
This class is also offered on Ecampus – that should help you some.

You're concerned about having to do Group Projects
There are no Group Projects in this class – I dislike them too.

You're concerned that you have no prior background in CG
No problem – that's what I am assuming. We start from zero.

You're concerned because you're not a CS major
This course has been deliberately tailored so that those outside of CS can still succeed in it. *CG is for everyone!*

You're concerned that you don't know C++
We will use what I would call "C++-lite", and there will be lots of sample code, and lots of professor/TA help.

You're concerned because you are not a good test-taker or memorizer
The quizzes and tests are all open-notes.

You're concerned that OpenGL is complicated to understand quickly
We are *deliberately* starting with the simplest way of using OpenGL so that everyone gets comfortable right away.

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Concerns Taken from the Pre-Quarter Qualtrics Survey, II

You're concerned that this class will be math-heavy
We will use *some* math, but I wouldn't call it "math-heavy".

You're concerned that you have no prior background in linear algebra
No problem – we use library functions to handle transformations. The underlying implementation of transformations is hidden and is, frankly, unimportant. It's the *use* of the transformations in an application that really matters in this class.

You're concerned that the A grade window is small
That's because we do a "soft grade" on your projects. "Did it work as required?" If yes, then full credit. No looking at programming style. No counting the number of comments. No timing how long it ran for.

You're taking care of a 2-month-old baby at the same time
OK, not much I can do to help you with this. But, there is a lot of flexibility in the way the class is structured, so that should help. BTW, send me a photo!

You're concerned the projects look too challenging
They are challenging. You wouldn't want it any other way. But, the challenge is just *with respect to what you know now*. We will start with Project #1 (pretty straightforward) and build from there. No projects will appear overwhelming when you look at them from the point of view of what we've covered so far.

You're concerned about there being remote options in case of disease or other emergencies?
By the time the quarter starts, all lectures will have been pre-recorded, mostly for the online section, but really for *everyone*. (If you are an on-campus student, you will get more out of being class, though.) Also, once a week I will do a Live Lecture on Zoom. Together, all this should give you the flexibility to weather anything.

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Concerns Taken from the Pre-Quarter Qualtrics Survey, III

"I have just moved to the USA. It is my first time here. I am still figuring out the rules and regulations."
Truthfully, just arriving in the USA doesn't put you at as much of a disadvantage as you think. No matter how long someone has been here, the changing rules and regulations are still often a mystery. ☺ First choice should be asking your advisor. Second choice – ask me. I may not know the answer, but I am usually good at figuring out who does. Welcome to the USA! I hope you enjoy your time here.

You're concerned that you don't draw or create much physical art at all, so you're nervous about your capabilities.
Personally, I can't draw to save my life! That was one of the things that attracted me to CG in the first place. I suck at drawing by hand, but I found I could "draw" in 3D by using what I *was* good at – programming. You will too.

You're concerned that your computer will not be able to handle the CG tasks well.
If you bought it in the last 5 years, you should be OK. Every desktop machine bought in the last 5 years has graphics hardware in it, even if you think you didn't specifically order any.

You're concerned that that you would like to use Blender.
This is a CS class, so our emphasis will be on *programming* graphics, rather than just using it. By the time we are done, though, you will understand a lot about what it took to *write* Blender. Also, because Blender is so fun and useful (a bunch of the illustrations in our notes were done on Blender), I will have one or two "Blender Nights" – optional Zoom classes on how to use Blender.

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The CS 450/550 Class Resources Page

Class materials will be linked into various Canvas pages,
but you can find *everything* here:

http://cs.oregonstate.edu/~mjb/cs550

(It doesn't matter if you are in CS 450 or CS 550. It doesn't matter if you
are on-campus or online. We *all* use the same Class Resources Page.)

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Course Topics

1. Summary of the computer graphics process
2. Coordinate systems and the graphics pipeline
3. Drawing a 3D scene using OpenGL
4. Single and hierarchical transformations
5. Projection from 3D to 2D
6. Altering the 3D viewing
7. Framebuffers and color
8. Lighting
9. Texture mapping
10. Transparency (blending)
11. Various approaches to 3D modeling
12. Various approaches to 3D rendering
13. Various approaches to 3D animation
14. Vertex Buffer Objects
15. GLM
16. Shaders (Vertex and Fragment)
17. Shadows
18. Stereographics
19. Virtual and Augmented Reality
20. A look into the computer graphics future -- Vulkan

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mjb – September 27, 2023

Grading: Points and Cutoffs

- 10 Quizzes @ 10 points each
- 2 Tests @ 100 points each
- 7 Projects, worth a total of 650 points
- CS 550ers will also do a 100-point Paper Review Project
  (450ers get a free 100 points for that assignment)

Total Points = 1050

Note that this is not 90-80-70-60!
I do it this way because we do such a soft grading on the programming projects.

Grade cutoffs will be no higher than:

Points	Grade
1020	A
1000	A-
980	B+
960	B
940	B-
920	C+
900	C
880	C-
860	D+
840	D
820	D-

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Quizzes

- Quizzes will go live on Canvas every **Friday at 12:01 PM** Pacific Time (one minute after noon).

- Each quiz is due at **23:59 Pacific Time Sunday evening** (one minute before midnight).

- *Exception:* Quiz #0 is due at 4:00 PM on Wednesday, October 4.

- There is *no quiz on* the Friday of Thanksgiving week (Week #8).

- Part of what is being quizzed is the time management skill to remember to take the quizzes. If you forget to take the quiz, **there is no make-up**.

- I *really* recommend that you take the quiz *before the end of Friday*! That way, your weekend activities won't distract you from getting the grade.

EECS Information for You:

Calendar of Events:

(EECS events are in orange, career events for students are in green)

https://eecs.oregonstate.edu/eecs-calendar

Resources for students looking for internships and jobs:

https://eecs.oregonstate.edu/eecs-student-portal

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More Information, I:

Link to the Code of Student Conduct:

https://beav.es/codeofconduct

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More Information, II:

Students With Disabilities
Accommodations for students with disabilities are determined and approved by Disability Access Services (DAS). If you, as a student, believe you are eligible for accommodations but have not obtained approval please contact DAS immediately at 541-737-4098 or at disability.services@oregonstate.edu or at http://ds.oregonstate.edu. DAS notifies students and faculty members of approved academic accommodations and coordinates implementation of those accommodations. While not required, students and faculty members are encouraged to discuss details of the implementation of individual accommodations.

Religious Holidays
Oregon State University strives to respect all religious practices. If you have religious holidays that are in conflict with any of the requirements of this class, please see me immediately so that we can make alternative arrangements.

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More Information, III:

Counseling and Psychological Services
Oregon State University's Counseling and Psychological Services (CAPS) provides OSU students with individual, relationship, and group counseling. I have met some of these people, and they are *really* good. If you are in any type of emotional difficulty, don't hesitate to contact them. If it makes it easier for you, I will walk over with you.

MySSP: Mental Health Support for Students
MySSP @ OSU is an app that gives all OSU students, including Ecampus students, 24/7 access by text or phone with a licensed mental health counselor (MySSP stands for My Student Support Program). The app makes it easy to schedule short-term counseling appointments with the same ongoing counselor and provides educational materials covering mental health topics. Students can communicate with a counselor in five different languages (Mandarin, Cantonese, French, Spanish or English); additional language options are available upon request. Students can download the Anytime Anywhere: MySSP @ OSU and learn more about the service at http://beav.es/anytimeanywhere. For questions, please contact Bonnie Hemrick (bonnie.hemrick@oregonstate.edu), Director of Mental Health Promotion.

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More Information, IV:

Life Events

As {John Lennon? Allen Saunders?} has said: "Life is what happens to you while you're busy making other plans". I care about you as a person. When life happens to you, send me an email and come see me. I might be able to help, I might not. But I surely can listen. You are not alone.

Reach Out for Success

University students encounter setbacks from time to time. If you encounter difficulties and need assistance, it's important to reach out. Consider discussing the situation with me or an academic advisor. Learn about resources that assist with wellness and academic success at http://oregonstate.edu/ReachOut. If you are in immediate crisis, please contact the Crisis Text Line by texting OREGON to 741-741 or call the National Suicide Prevention Lifeline at 1-800-273-TALK (8255)

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More Information, V:

Basic Needs
Success at OSU means knowing and using your resources. One helpful resource is the community of staff available at the Basic Needs Center (BNC) for support (bnc@oregonstate.edu, 541-737-3747). Students can drop in during open hours and talk with a BNC student leader for resources, ideas and strategies connected to basic needs challenges. The BNC is often known for its food pantry but there are other resources connected to groceries and affording food often available and staff who can help you work through housing stressors. Undergraduate students, living in Oregon, are especially encouraged to explore SNAP as a resource. BNC staff are skilled with helping students navigate this process.

Additionally, the BNC Textbook Lending Program offers students the opportunity to check out required textbooks for the academic term.

Furthermore, if you are comfortable doing so, please talk with me. I will do everything I can to help you.

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