An Introduction to CS 450/550

"Computer Graphics is the world's #1 enabling technology. Computer Graphics is for everyone!" -- Mike Bailey

"What will matter is what you learned and how you used it." -- poster outside my office

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Mike Bailey

• Professor of Computer Science, Oregon State University

• Has been in computer graphics for over 30 years

• Has had over 9,000 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!
**Concerns Taken from our Mid-summer Qualtrics Survey**

<table>
<thead>
<tr>
<th>Concern</th>
<th>Move</th>
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</thead>
<tbody>
<tr>
<td>You’re concerned with the workload</td>
<td>This is the summary of what several years of this class have told me about the hours/week workload.</td>
</tr>
<tr>
<td>You don’t like having to commute 2 hours each day for class</td>
<td>This class is also offered on Ecampus – that might help you some.</td>
</tr>
<tr>
<td>You’re concerned about having to do Group Projects</td>
<td>There are no Group Projects in this class – I dislike them too.</td>
</tr>
<tr>
<td>You’re concerned because you’re not a CS major</td>
<td>This course has been deliberately tailored so that those outside of CS can still succeed in it. <em>CG is for everyone!</em></td>
</tr>
<tr>
<td>You’re concerned because you are not a good test-taker/memorizer</td>
<td>The quizzes and tests are all open-notes.</td>
</tr>
<tr>
<td>You’re concerned that you have no prior background in linear algebra</td>
<td>No problem – we use library functions to handle transformations.</td>
</tr>
<tr>
<td>You’re concerned that you have no prior background in CG</td>
<td>No problem – that’s what I am assuming. We start from zero.</td>
</tr>
<tr>
<td>You’re concerned that this class will be math-heavy</td>
<td>We will use some math, but I wouldn’t call it “math-heavy”.</td>
</tr>
<tr>
<td>You’re concerned that OpenGL is complicated to understand quickly</td>
<td>We are <em>deliberately</em> starting with the simplest way of using OpenGL so that everyone gets comfortable right away.</td>
</tr>
<tr>
<td>You’re concerned that you don’t know C++</td>
<td>We will use what I would call “C++-lite”, and there will be lots of sample code, and lots of professor/TA help.</td>
</tr>
</tbody>
</table>
The CS 450/550 Resources Page

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

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

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
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

Grade cutoffs will be no higher than:

<table>
<thead>
<tr>
<th>Points</th>
<th>Grade</th>
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<tbody>
<tr>
<td>1020</td>
<td>A</td>
</tr>
<tr>
<td>1000</td>
<td>A-</td>
</tr>
<tr>
<td>980</td>
<td>B+</td>
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<tr>
<td>960</td>
<td>B</td>
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<td>900</td>
<td>C</td>
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<td>880</td>
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<td>860</td>
<td>D+</td>
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<tr>
<td>840</td>
<td>D</td>
</tr>
<tr>
<td>820</td>
<td>D-</td>
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</tbody>
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Note that this is not 90-80-70-60!
I do it this way because we do such a soft grade on the programming projects.

Quizzes

- Quizzes will go live on Canvas every Friday at 2:00 PM Pacific Time.
- Each quiz is due at 23:59 Pacific Time Sunday evening.
- *Exception:* Quiz #0 is due at 4:00 PM on Friday, October 1.
- There is *no quiz* on the Friday of Thanksgiving week (Week #9).
- Part of what is being quizzed is the time management skill to remember to take the quizzes. Thus, 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.
More Information, I:

Link to the Code of Student Conduct:
https://beav.es/codeofconduct

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 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.
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)

Basic Needs
Any student who has difficulty affording groceries or accessing sufficient food to eat every day, or who lacks a safe and stable place to live, is urged to contact the Human Services Resource Center (HSRC) for support: hsrc@oregonstate.edu, 541-737-3747. The HSRC has a food pantry, a textbook lending program, and other resources to help. Furthermore, if you are comfortable doing so, please talk with me. I will do everything I can do to help you.