

# CSCI 315: Computer Graphics

<b>Professor</b>	Adam A. Smith aasmith@pugetsound.edu <a href="http://mathcs.pugetsound.edu/~aasmith/">http://mathcs.pugetsound.edu/~aasmith/</a>	Thompson 390E Office Hours MW 11-12, Th 1-2 x3557
<b>Meetings</b>	MWF 2:00-2:50 in Thompson 399. The final will be on December 12th at 4:00.	
<b>Course Description</b>	<p>This is a first course in computer graphics. We will be creating realistic-looking graphics as part of an immersive three-dimensional world.</p> <p>The capability of graphics hardware has increased vastly in the last decades. Knowing how to make use of it is not only fun, but a useful skill upon which you can base a career. Two particular applications stand out with respect to computer graphics: games and animation. This class is the first step toward developing software in one of these two areas, which employ many thousands of programmers. However, there are other fields that make use of computer graphics, such as image processing, scientific computing, and computer vision. It is also an active area of research, in its own right.</p> <p>We will be using OpenGL (where the “GL” means “Graphics Library”). This is a cross-platform API that is free for personal use and most for-profit uses. When coupled with Java, it allows us to create programs in a “system-agnostic” manner. That is, it will barely matter whether you are programming using Linux, Macintosh, or Windows. Even so, the principles we will learn will be applicable to other graphics APIs such as Vulkan, DirectX, Metal, and WebGL.</p>	
<b>Topics Covered (“Learning Outcomes”)</b>	By the end of this class, you will understand and be able to make use of: <ul style="list-style-type: none"><li>• The basics of OpenGL.</li><li>• Shaders and shader language.</li><li>• The graphics pipeline.</li><li>• Color models.</li><li>• Linear transforms using matrices.</li><li>• Perspective.</li><li>• Hierarchical object models.</li><li>• Lighting models.</li></ul>	
<b>Web Page</b>	The class web page will be located at <a href="https://mathcs.pugetsound.edu/~aasmith/cs315/">https://mathcs.pugetsound.edu/~aasmith/cs315/</a> . Valuable info and links will be posted there.	
<b>Text</b>	We will be using COMPUTER GRAPHICS PROGRAMMING IN OPENGL WITH JAVA (THIRD EDITION), by Gordon and Clevenger. (Please be careful that you do not buy the variant textbook using C++.)	
<b>Prerequisites</b>	You should have already passed CSCI 261 or its equivalent, with a C- or higher. You should also know the basics of geometry and trigonometry.	
<b>Course Policies</b>	<p>There will be about seven programming assignments over the course of the class—usually one every other week. You are free to talk to others in the class about them, but all code must be <i>100% your own work</i>.</p> <p>Assignments will be penalized by 20% for each working day (or fraction thereof) they are late, down to 40%. However, you will have three “extension days” during the semester to extend a deadline by one working day. These are intended for unforeseen circumstances, and will be used automatically unless you specify otherwise.</p>	

You may find yourself using resources outside the text and lecture notes. You are responsible for citing all resources you use, so as to avoid academic dishonesty. You are also responsible for making sure that outside sources are compatible with the methods we will be using.

You all should be aware of the Honor Code at the college. Please do not cheat—it will not go well for you. *Any suspected cheating will be immediately reported.*

Exams are closed book, and will be cumulative. You are allowed a calculator (or your phone, so long as it is in “airplane mode”) and one two-sided, letter-sized page of notes.

### **Grading**

Final grades will be determined as follows:

Homeworks	Midterm 1	Midterm 2	Final
35%	20%	20%	25%

In particular, notice how heavily weighted assignments are. *Missing assignments is the easiest way to get a lower grade.* Please be sure you do them, and on time.

Tests will be cumulative. They will be graded on a curve, with the highest score considered to be 100%. In addition, class participation and effort may help bump you up, if your final grade is borderline.

Grades on individual assignments will be posted to Canvas. However Canvas is a program with many odd “*features*”, and I don’t guarantee that its calculations are 100% accurate. The final authority is the calculation done on my spreadsheet. Final grades in the 90s are considered As, 80s are considered Bs, and so on, with the top third of the range considered “+ grades”, and the bottom third considered “- grades”.

### **Attendance**

I will not be keeping attendance (except on the first day). However, odds are that your attendance will correlate highly with your final grade.

### **Miscellany**

If there are any special holy days that you will be taking off, please let me know as soon as you can so that we can work around them.

I am hopeful that we will not have any covid outbreaks this semester. I will do my best to make sure that the risk to all of us is minimal. This may include requests for people to wear masks, or measures to increase ventilation in the classroom.

Please also consider getting a flu shot. Influenza kills, and vaccination saves lives. Further, you really don’t want to be suffering “flu-like symptoms” during the time of covid.

Finally...if there’s anything else I can do to help you, please let me know. I’m willing to go out of my way to make this a valuable class for you, but I can’t do that unless you talk to me.

# Mandatory UPS Boilerplate Syllabus Text

In their infinite wisdom, the powers that be at UPS have decreed that this text will be included in every class syllabus. This should therefore be considered part of the main syllabus.

## University, Academic, and Administrative Policies

There are many university policies and resources that offer guidance on how to be safe and make the most of your college education. Here are a few that you should take a moment to review:

- Please review university emergency preparedness, response procedures, and a training video posted at <https://www.pugetsound.edu/emergency/>.
- For information on communicable disease outbreak prevention, please see <https://www.pugetsound.edu/emergency/communicable-disease-outbreak-prevention/>.
- For information on academic and administrative policies (such as policies on grade policies, leaves of absence, declaring a major, academic integrity, and academic petitions) please refer to the academic and administrative policies section of the Bulletin.
- If you are seeking a religious accommodation in an academic course or program, please follow the process provided in the university's policy on Student Religious Accommodations in Academic Courses or Programs, available at <https://www.pugetsound.edu/office-university-counsel/policies/campuswide-policies/student-religious-accommodations-academic-courses-or-programs/>.
- If you have any concerns about prohibited harassment or discrimination that may be affecting you or others at Puget Sound, please contact the university's Title IX Coordinator/Equal Opportunity Officer, Wheelock 218, 253.879.3793, website: <https://www.pugetsound.edu/title-ix-equal-opportunity/>, email: [titleix-ooo@pugetsound.edu](mailto:titleix-ooo@pugetsound.edu). The Title IX Coordinator/Equal Opportunity Officer can explain available options and help address concerns informally or formally.
- If you have a physical, psychological, medical, or learning disability that may impact you as a student at Puget Sound, please contact Student Accessibility and Accommodation, Howarth 105, 253.879.3399, website: <https://pugetsound.edu/saa/>, email: [saa@pugetsound.edu](mailto:saa@pugetsound.edu). They will determine with you what accommodations are necessary and appropriate.