Course Overview

This course provides an overview of software and hardware systems for computer graphics including design factors related to human interaction, color perception and other ergonomic considerations. Emphasis is placed on understanding the principles underlying interactive computer graphics: basic software needs, the hierarchical structure of graphics software from low-level line drawing algorithms to high-level 3-D modeling systems incorporating rotation, scaling, translation, perspective, 2-D and 3-D clipping, and color shading. More advanced topics include current hardware, visible surface algorithms, reflectance models, anti-aliasing techniques, and mathematical techniques for curve and surface representation. Slides, videos, and films showing actual systems in use supplement the lecture material.

CS-184 Instructional Staff

	Office	E-Mail Address	Office Hours
Prof. James O'Brien	633 Soda Hall	job@berkeley.edu	2:00 - 4:00 pm Fridays
T.A. Niels Joubert	651 Soda	niels@berkeley.edu	5:00 - 6:30 pm Tues / Wed
T.A. James Andrews	711 Soda	jima@eecs.berkeley.edu	4:00 - 5:00 pm Tues / Thurs

Class / Section Locations and Times

	Location	Days	Time
Lectures	306 Soda Hall	Monday, Wednesday	2:30 - 4:00 pm
Section 1	320 Soda Hall	Tuesday	10:00 - 11:00 am
Section 2	320 Soda Hall	Wednesday	12:00 - 1:00 pm
Section 3	320 Soda Hall	Tuesday	11:00 am - 12:00 pm

Exam Schedule

Midterm Exam	Monday, October. 13th, in class
Final Exam	Thursday, Dec. 18th, 5:00 - 8:00 pm
Final Project Presentation	Wednesday, Dec. 10th, 2:30 - 6:00 pm

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Grading

Your grade will be determined by your performance on a combination of homework assignments, a final project, one midterm, and one final exam. The percentages assigned to each of these categories are:

- Assignments   40 %

- Project   20 %

- Midterm exam   20 %

- Final exam   20 %

Within each category, grading will be done using a point system. Each assignment, test question, and so on, will be worth some number of points. Your score in that category will simply be the number of points earned divided by the total possible.

Grading will be done on a curve. As a result if you, for example, score 10 points out of 70 on a homework, you should only be concerned if other people tended to score better than that. By the same token scoring 65 out of 70 should concern you if the rest of the class averaged 68. I try to gauge difficulty so that a very good performance is about 90%, but sometimes I under- or overestimate the difficulty of an exam or assignment. I also will adjust the curve upward or downward to account for the general performance of the class.

There will often be extra credit options on the assignments. Points awarded for those get added in after the curve has been set... so they really are extra.

Prerequisites

A data structures course (*e.g.* CS 60B), C/C++ programming ability, and knowledge of linear algebra, calculus, and trigonometry. The first two assignments should be easy. If you find them baffling, you may have a problem and should consult the instructor.

Assignments

You will have a couple of written assignments which will exercise your knowledge of the theoretical basis of computer graphics. They will also be good preparation for the exams. You may discuss problems with other students but all work for written assignments must be strictly your own. Please note that we were not able to hire psychic readers this semester: if your written assignments (or exam answers!) cannot be read they will not receive points. **Written assignments should be turned in under Professor O'Brien's door. (633 Soda Hall)**

It is your responsibility to arrange time to turn in written assignments before the deadline. Soda Hall is locked in the evenings, nevertheless most undergrads manage to figure out ways into the building using elite ninja skills. If you lack these abilities please make sure you come to turn in your assignment before the building locks up. Failing to turn your assignment in because you were locked out of the building will incur standard lateness penalties.

Programming assignments must compile and run on the instructional machines. It is your responsibility to make sure that they do. The first time you have a compile/run problem the grader has the

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option of allowing you to correct the problem. After the first time, the assignment may not be graded.

Test your programs on the instructional machines. In the past people have turned in programs that worked on their own machine and only verified that it compiled on the instructional machines. Variations in compiler and library versions then caused bugs that were benign on their home machine to manifest as runtime errors on the instructional machines. They lost points.

Programing assignments may be done in pairs. Of course, you may choose to work alone. If you work in a pair you only need to hand in one copy of any documentation required, but make sure that you indicate clearly who was included in the pair and how the task was divided up. If you work in a pair make sure that you think carefully about how you are going to divide up the programming effort between you so that you can coordinate your efforts without too much conflict.

If you work in a group for the programing assignments or final project, it is your responsibility to pick good partners. Everyone in a group gets the same score. Please don't waste time by telling me that your partner was a slacker and that there should be some adjustment made to your scores.

Instructions for turning in each assignment will be included with each of the assignments and may vary over the semester. Read them carefully. Those instructions override anything contained in this document.

Late assignments will be penalized 10% of their value plus an additional 20% for each 24 hour period that elapses before you turn them in. Example: An assignment due Monday at 1pm, turned in Monday at 1:01pm loses 10%, Tuesday at 1pm still loses 10%, and Tuesday at 1:01pm loses 30%. If you have some special circumstance would prevent you from turning an assignment in on time, you must discuss the issue with me *before* the deadline.

This course has a reputation for somewhat demanding project work. You have been warned, no whining allowed.

Academic Honesty

I am generally happy for people to use code or ideas that they did not create themselves, but you must clearly declare what you have used from others and what was original from you. If you don't tell us anything, then we'll assume that you are presenting work as your own work. Presenting other peoples' work as your own is academic dishonesty. Collective responsibility applies: if you work in a pair, both of you will be held responsible for the resulting project.

Students who engage in dishonest activities with intent to alter their grade will receive an 'F' in the course and then be reported to the University. Do not bother asking me to give you a second chance as it is a waste of time.

Communication

You are responsible for reading the newsgroup `ucb.class.cs184` -- all bug announcements and fixes for assignments and lectures will be distributed there. Routine communication about the course should be sent to `cs184@imail.eecs.berkeley.edu` or posted to the news group. E-mail sent to the TA's or professor may be reposted on to the newsgroup in redacted form.

If you have some issue that will prevent you from meeting an assignment deadline, or from sitting for an exam, you must let the professor know about it **beforehand**. I am happy to accommodate

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religious, medical, or family obligations (within reason). If some emergency arises at the last minute that precludes prior communication, then be prepared to provide supporting documentation.

Dire Warning

Teaching a class to people who sit quietly is boring for the instructor. People who participate tend to learn more. So I would like to encourage class participation. If people appear to be interested and willing to participate then great... if not then I reserve the right to start giving really annoying little quizzes every class.

Text Books

Required:

• P. Shirley. <u>Fundamentals of Computer Graphics</u> (Make sure you get the newest edition as it has changed quite a bit.)

Other Useful Textbooks:

• J. Foley, A. van Dam, S. Feiner, J. Hughes.Computer <u>Graphics: Principles and Practice</u>

• A. Watt. <u>3D Computer Graphics</u>

• D. Hearn, M. Baker. <u>Computer Graphics with OpenGL</u>

See the class webpage (and Google) for other useful resources.