CS480/580 Introduction to Computer Graphics

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Office Hours: Tuesday/Thursday: 10am – 10:45 am; 8:30 pm-9pm
Wednesday: 11 am-12 pm

This course is an introduction to the concepts in Computer Graphics. Programming assignments could be completed using the OpenGL Graphics library.

You can implement your projects on a computer of your choice. Note that a working demo is required for all programming assignments in this class. Please make sure that OpenGL sample programs are working on your system at your earliest convenience, so that programming assignment demonstrations can be shown without any problem. In the past, several students have successfully used their own notebooks, PCs, Linux boxes, and SGI s. If you are planning to use VisualC++ then you might need several (.dll, .obj) files during compilation/linking which may not be installed at systems which you might be using. Several OpenGL examples are available on internet sites (e.g. www.opengl.org). Please be aware that you will be responsible for installing necessary software on your system and a working demo is required for all programming assignments. PCs in CS-laboratories could also be used for student demonstrations. Please make sure that you have the required libraries so that your programs could be recompiled during the demonstration.

A large number of demo programs from the OpenGL redBook are under
/usr/share/src/OpenGL/book/red_book_92 on the SGI machine, and can be copied to your directory on the SGI account. Several makefile exists under /usr/share/src/OpenGL for compiling these programs. Please contact me if interested.

In addition to OpenGL, the Maya Animation package is also available for graduate term projects on SGI Machines. A limited version of Maya could also be down-loaded from Alias Wavefront’s web-site onto your systems.

There are many sites for sample openGL code and compiling instructions as well. For example, (a) Nate Robins tutorial at www.cs.utah.edu/~narobins; (b) www.opengl.org; (c) www.sgi.com/software/opengl; (d) www.cs.unm.edu/~angel.

A simple introductory tutorial on OpenGL can be found at www.cs.uccs.edu/~semwal under OpenGL tutorial. However, no openGL code is provided as many other sites are available, as indicated above.

Back-up classes are scheduled for Saturday February 4, 2006 and/or April 8th, 2006 at 9:00am-11:45 am in case of weather related emergencies or my absence due to trip or illness. Please mark your calendar at your earliest convenience.

1 Distribution of grades

There are two homework assignment, several programming assignments, and two closed book exams. The distribution of grades (100 percent) is as follows:

- Homework (Two assignments) 5 percent each, to be done individually. (Total: 10 percent).

- In class, Mid-term (25 percent) and Final examinations (25 percent). (Total: 50 percent).

- CS480 Programming assignments (three) (Total: 40 percent). First programming assignment (5 percent); second programming assignment (20 percent); third programming assignment (15 percent). Second and third programming assignments can be combined as a term project of larger extent, please contact semwal if interested.
CS580 Programming assignments (Total: 40 percent). First programming assignment (5%); Second programming assignment (15 percent); Term project as Third programming assignment (15 percent); term-project report (5 percent). Second and third programming assignments can be combined as a term project of larger extent, please contact semwal if interested.

2 Week by Week Schedule

Please keep yourself up-to-date with the lectures, as sometimes only selected portions of the Chapters would be covered. I will also cover special topics of interest throughout the semester.

An outline of the course is as follows:

- Week 4. Chapters 5-6, Homework 1 (duration: one week). (Graduate students to decide larger scope project (February 2nd, 2006).
- Week 5. Graduate term project proposal due (one page by eMail). (February 2nd, 2006).
- Week 6-7. Programming Assignment 2 (duration: two weeks).
- Week 8. Chapter 11.
- Week 13. Chapter 16, Homework 2 (duration: one week).
- Week 14-15. CS580 term project demonstrations (May 1-5th, 2006). Special topics, general discussion.
• Final exam: in-class and closed-book (*Date: May 9th, 2006, 4:30-7:05 p.m.*).

Thanksgiving is March 27th-April 2nd, 2006.

3 Programming Assignments

As part of assignment number one, please compile and execute an OpenGL program example at your earliest convenience. Programming assignment one would be provided in the second week of class.

**For CS480 students**, following options are available:

1. Three programming assignments using OpenGL.

2. CS480 students can also substitute second and third OpenGL programming assignments with a term project similar to the graduate students. Prior permission is required for this option. Please see me at your earliest convenience, preferably in the first week of the class itself, if interested in this option.

**Graduate (CS580) students** are expected to finish the first OpenGL programming assignment similar to the CS480 students. After completing the first assignment a major term project would be undertaken by the CS580 students for the duration of the term. This major term project would be at least equivalent in scope to the combination of the second and the third programming assignments for CS480.

Term project Proposals for CS580 students are due by February 2nd, 2006. Each project group should submit a one-page project proposal by February 2nd, 2006. However, please consult as much in advance as possible so that we can discuss the topic and the extent of the term project. As indicated earlier, all CS580 term projects are to be approved by me. A mid term demo is also required from CS580 students before the end of March. The final demonstration dates for CS580 term projects are May 1-5th, 2006. A user’s manual (How to use the program), a program listing, and a project term-report (description of project, research done, methodology used, bibliography etc.) is required during the final (third) demonstration of the CS580 term project.
This is a cross listed course requiring more work to be done by graduate (CS580) students than undergraduate (CS480) students.

4 Programming-Assignment Demonstrations

A sign up sheet for the program demonstrations will be posted outside my office door (ENG180). Depending upon the number of students, students could work individually, or form two member groups. However, expectations will be higher for the group projects, and needs to be determined in consultations with me. The grade in these projects would be identical among all the members of the group.

The programming assignments would be graded on the basis of the listing of the programs and the demonstrations. I would like all the members of the group to be present during the demonstration.

Demo-dates are expected to straddle the due date of the programming assignment. Usually student demonstrations take approximately fifteen minutes and a grade for the demo is normally allotted just after the demonstration.

Every program should have reasonable amount of comments e.g. at least one header per procedure etc. A group, can ask for advice on a programming matter from another group but may NOT incorporate (or copy) the other group’s code into their program. Any evidence of submission of another group’s work as your own will result in severe penalties (possibly failing the course).

Please note that OpenGL and other related packages (Glut, GLU, GLX, Maya etc) are only briefly covered in the class, as details of syntax etc of packages is not the main focus of lectures. Therefore, students are expected to learn some features of these packages on their own.

5 Late submissions

Late submission of programming assignments and homeworks would be accepted, but with a penalty of 50 percent of the grade. A programming assignment without a working demonstration can only receive a maximum of thirty percent of the grade for that assignment. After one week of the
last demo-date, late submissions will not be accepted. Under extreme circumstances, such as job related absence or illness, an extension would be provided on an individual basis. Please contact me at your earliest in case an extension is needed for assignments, homeworks, or exams.

6 Text Books and further reading


3. OpenGL Primer by Edward Angel, Pearson education. Recommended text book for understanding the basics of OpenGL.

4. Several books on Maya: Learning Maya from Alias Wavefront.

5. Maya by Riddle and Brit, PeachPit Press.


10. Curve and Surfaces for CAD by Farin.

7 About the CS580 Term Project

CS580 student’s term projects can come from a variety of areas, such as: 3D Games, animation, modeling natural phenomena, shading of 3D objects, realistic images (ray tracing and radiosity), force-feedback devices, advanced animation and virtual reality, medical application of graphics, morphing, Maya based animations, and game development. All these projects may require reading ahead and research into Journals and magazines: e.g. IEEE Computer Graphics and Application, Computer Graphics and Image Processing, ACM transaction on Graphics.
8 Department Policy on Late Drop

A late drop will be approved only if there is documented evidence that the student was prevented from attending a significant number of classes by circumstances beyond his or her control.

Thank you. HAVE FUN.