

CS3370 – Computer Graphics

Fall 2009

1. General Information

Instructor:

Olac Fuentes

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(915) 747-6956

Office hours: Wednesdays 8:30-11:30 or by appointment, in CSB 208.

Chat: olacfuentes@gmail.com – feel free to ask questions if I'm available

Teaching Assistant:

Geovany Ramirez

email: geoabi@gmail.com

Office hours: MWF 11:30 - 13:00 or by appointment, room 109D

Chat: geoabi@gmail.com – feel free to ask questions if he's available

Meeting Times:

TR 9:00-10:20, CSB 321

Class webpage:

www.cs.utep.edu/ofuentes/cs3370Fall09.html

2. Course Contents

- 1) Introduction (Chapters 1 and 2)
 - a) What is computer graphics?
 - b) Applications
 - c) Graphics hardware
 - d) Introduction to OpenGL
- 2) Graphics Output Primitives (Chapters 3 and 4)
 - a) Lines
 - b) Curves
 - c) Circles
 - d) Ellipses
 - e) Polygons
 - f) Line attributes
 - g) Polygon attributes
- 3) Geometric Transformations (Chapter 5)
 - a) 2D translation, rotation and scaling
 - b) Composite 2D transformations
 - c) 3D translation, rotation and scaling
 - d) Composite 3D transformations
- 4) Two-dimensional Viewing (Chapter 6)
 - a) The clipping window
 - b) Viewpoint transformations
 - c) 2D viewing with OpenGL

- 5) Three-dimensional Viewing (Chapter 7)
 - a) Overview
 - b) Coordinate transformations
 - c) Projections
 - d) 3D viewing with OpenGL
- 6) Three-dimensional Object Representation (Chapter 8)
 - a) Polyhedra
 - b) Curved surfaces
 - c) Spline representations
- 7) Visible-surface Detection Methods (Chapter 9)
 - a) Back-face detection
 - b) Depth-buffer method
- 8) Illumination Models and Surface Rendering Methods (Chapter 10)
 - a) Light sources
 - b) Basic illumination models
- 9) Computer Animation (Chapter 13)
 - a) Double buffering
 - b) Key-frame systems
 - c) Motion specification
 - d) Animation with OpenGL

3. Policies and Other Information

Pre-requisites:

Data structures and matrix algebra.

Grading:

2 midterm exams 12.5% each

Final exam 20%

Written homework, quizzes, and in-class exercises 10%

Programming assignments 35%

Final project 10%

The nominal percentage-score-to-letter-grade conversion is as follows:

90% or higher is an A

80-89% is a B

70-79% is a C

60-69% is a D

below 60% is an F

In addition, a student will receive a grade of F if either of these two conditions applies:

- a. His/her average score in the exams is less than 50%
- b. His/her average score in the programs/project is less than 50%

Extra Credit: For each lab and project, the TA and instructor will select a submission for the “Best Lab Award”, which will receive 30% extra credit and bragging rights.

Cellular phone usage is prohibited.

Laptops are allowed (please turn sounds off) to take notes and run sample code, but a student using his/her laptop for non-class related purposes will be asked to leave.

Policy on Collaboration

Collaboration is strongly encouraged.

It is OK to:

- Talk with other students about approaches and ideas.
- Get ideas and extra information from the internet, books, etc.
- Get code from example programs – but you **MUST** reference the source; otherwise the code is deemed to be plagiarized.

However, it is not OK to:

- Share code with another student (if a piece of code is submitted by two or more students, both students are guilty of cheating, regardless of who wrote the original code).
- Use ideas or code acquired from another source without attribution
- Look at another student's code
- Debug another student's code

Text

Computer Graphics with OpenGL, 3rd Edition, Donald Hearn and Pauline Baker, Prentice Hall, 2004.

You are required to obtain this book for use in this course. Note that photocopied textbooks are a violation of copyright law. Any student caught with a photocopied book will be referred to the Dean of Students for discipline.

Tools

- OpenGL

Disabilities

If you feel that you may have a disability that requires accommodation, contact the Disabled Student Services Office at 747-5184, go to Room 106E Union, or email dss@utep.edu

4. Lab Submission Guidelines

Lab assignments and deadlines will be posted on-line.

For each lab assignment, submit by email a written report and source code to the T.A. at geoabi@gmail.com and instructor at olacfuentes@gmail.com (please don't use UTEP addresses for this).

Each lab grade will be computed from the following elements:

- Report (80% of grade)
- Source code (20% of grade)

Report

You must submit a printed report describing what you did for the lab. Your grade will be computed mainly from this report, so it's important that you carefully document your work. Your code will be used to verify your experimental results, to clarify doubts we may have, and to assess efficiency of implementation and programming style.

Submitted reports must include the following items:

Introduction – Brief description of the problem you are trying to solve and the approach you are using to solve it.

Proposed solution – How did you solve (or attempt to solve) the problem? Provide an informal, high-level description of algorithms and data structures used.

Implementation – Description of your code (not the actual code). Explain the design choices you made, including how you broke the program into modules, your user interface, input and output, etc.

Experimental results – Describe the experiments you performed to test your program. The experiments must be described in a way that allows anybody to replicate them using your code. Show sample images produced by your program (very important for the “best lab award”).

Conclusions – Explain what you learned from the project. If you did not achieve all the stated goals of the project, mention that here. If you did work in addition to the requirements mention that here, too.

While the most important factor to consider in grading is whether the project’s goals are attained, we will also take into consideration the following:

- Completeness - Does your report cover all required aspects in enough detail?
- Clarity - Are those aspects clearly explained?
- Language - Is the report written with proper grammar and spelling?
- Presentation - Is the formatting appropriate?

Source Code

In addition to program correctness and consistency with reported results, we will assess the following:

- Efficiency - Are the methods implemented optimal/near optimal in terms of time and space?
- Design - Are operations broken down into methods in a reasonable way?
- Style - Is the program indented correctly and consistently? Do methods and variables have meaningful names?
- Robustness - Does the program handle erroneous or unexpected input gracefully?
- Documentation - Do all program files begin with a comment that identifies the course, author, assignment, instructor, T.A., date of last modification, and purpose of program? Are all methods clearly documented? Are all non-obvious code segments clearly explained?

Policy on late projects:

Lab project grades will be reduced by a factor of 8% for each working day they are late. Unless otherwise stated, labs are due at 11:59 p.m. on the due date.

5. Standards of Conduct and Academic Dishonesty

You are expected to conduct yourself in a professional and courteous manner, as prescribed by the UTEP Standards of Conduct. Academic dishonesty includes but is not limited to cheating, plagiarism and collusion. Cheating may involve copying from or providing information to another student, possessing unauthorized materials during a test, or falsifying data (for example program outputs) in laboratory reports. Plagiarism occurs when someone represents the work or ideas of another person as his/her own. Collusion involves collaborating with another person to commit an academically dishonest act. Professors are required to - and will - report academic dishonesty and any other violation of the Standards of Conduct to the Dean of Students.