Master of Science in Computer Information Systems MSCIS 351: Introduction to Computer Graphics

Instructor:

Amy Gooch Office: Room 228, 2nd floor, 1890 Maple Avenue, Evanston Office Number: 847-467-1336 (please use email, not phone number) Email: <u>amygooch@northwestern.edu</u>

Course Description:

Web page: http://www.cs.northwestern.edu/~ago820/cs351/

Course Description:

This course is an introduction to computer graphics, including rasterization, modeling, viewing, lighting, texture mapping, and raytracing for students with a background in programming and linear algebra. We focus on the kind of 2D and 3D interactive graphics used in games, although we will spend some time on raytracing.

Course Objectives:

Upon completion of this course, the student will be able to:

- Familiar with image rasterization and linear interpolation
- Understand 2D and 3D transformations, viewing, and cameras
- Familiar with rendering including lighting, modeling, and texture mapping
- Written a raytracer

Required Texts:

- Fundamentals of Computer Graphics, Peter Shirley ISBN: 1-56881-124-1
- OpenGL(R) Programming Guide: The Official Guide to Learning OpenGL, Version 1.2 (3rd Edition) by Mason Woo, Jackie Neider, Tom Davis, Dave Shreiner, OpenGL Architecture Review Board

Course Requirements and Evaluation:

- Five Programming Projects @ 60 % of grade
- Class Participation and Attendance @ 10 % of grade
- Weekly Quizzes @ 30 % of grade

There will be five programming projects and weekly quizzes which will cover the conceptual and mathematical material covered in lectures and reading. At the end of the quarter, I will drop your lowest quiz score. You may miss one class without loosing participation points. At the beginning of each class, each student will bring in the following with regard to the reading assignment:

- 1. What they found to be the most interesting in the reading
- 2. What they were the most confused about or would like to know more about

Projects:

Projects may be done in either C or C++. The code fragments we hand out to get you started will probably be in C. Projects will be turned in via Blackboard or email. I must be able to compile your program and run it on designated machines in order for you to receive a grade. Documentation, graphics design, performance and code design will all contribute to your project grades. For some projects, we will define a minimum set of required features. A project which implements these features well will receive a grade of B. To get an A, you will need to improve the basic project in some way: new features, technical improvements, good design, better interaction, etc.. We will discuss possible improvements in class and on the assignment web pages. Unusually excellent or innovative projects may receive extra credit, which can be used to bring up your score on other projects.

Rules for Projects:

- Code obtained from elsewhere and used as part of a project must be documented in the README. Failure to do so will be treated the same as cheating. Course credit cannot be obtained for someone else's work (obviously!).
- Ideas obtained from elsewhere, either from a printed paper or from online material, must be referenced in your project report.
- You may develop at home, but projects and assignments must work in the T-lab or on Amy's Mac. Failure of a program to compile or execute properly in that environment will result in loss of marks.
- If you discover a link that you think would be helpful to current or future graphics students, feel free to send it to us and we'll consider adding it to our web pages.
- Late projects will loose 5% on the first 12 hours, 10% on each subsequent late 12 hours (to allow for minor bugs that come up at the last minute.)

Weekly Schedule of Topics:

Week 1	Rasterization and Linear Interpolation
Week 2	Matrices and Transformations
	Project 1 Due
Week 3	More on Transformations, L-Systems
Week 4	Viewing and Projections (2D and 3D)
	Project 2 Due
Week 5	Hidden Surface Removal and Shading
Week 6	Shading and Lighting
	Project 3 Due
Week 7	Texture Mapping
Week 8	Curves and Surfaces
	Project 4 Due
Week 9	Ray Tracing
Week 10	Current Computer Graphics Research
	Project 5 Due