CS4353 Course Outline
Advanced Graphics *

January 13, 2009

Instructor: John E. Howland
TEXT: *Interactive Computer Graphics, A Top-Down Approach Using OpenGL*, Fifth Edition, by Edward Angel.
Open GL, A primer, Third Edition, by Edward Angel.

1 Course Objectives

- Introduce advanced interactive computer graphics concepts
- Introduce advanced architecture of computer graphics devices
- Introduce advanced mathematical representation of graphic images
- Develop advanced graphics programming skills

2 Course Schedule

Some important dates are:

- Project Selection Date, January 23, 2009
- Project Interim Report Date, February 20, 2009
- Project Due Date, Saturday, May 9, 2009, 9:30 a.m.

3 Course Project

The primary focus of this course will be the selection, design and implementation of a graphics project. The project will have an interim report as well as student seminar presentations. The project due date is the final examination time for this class, Saturday, May 9, 2009, 8:30 a.m. Class presentations of projects will be made during the final examination period.

4 Project Write-up

Each student will prepare a project write-up in the form of a technical paper suitable for publication in an undergraduate research journal. Such papers will contain (at least) the following sections:

1. Title page with author affiliation
2. Abstract
3. Introduction (problem statement; results of literature search, etc.)
4. Several Sections which constitute the body of the paper where the details of the author's solution to the problem are given.

*The Instructor reserves the right to make changes to this course outline and will provide notification of any such changes

5. Conclusions
6. Bibliography
7. Appendices containing all or portions of the programs written for the project.

Students must submit portions of the project paper for proof reading at various due dates. For example, the title page and abstract are due at the project selection date (January 23, 2009). The Introduction and literature search are due at the time of the Interim Project Report date (February 20, 2009). The instructor will proof read each paper throughout the semester and offer suggestions for re-writing. A draft of the completed paper is due on May 1, 2009.

5 Seminar Presentations

This offering of Advanced Graphics has a small number of students. Because of this as well as the fact that there are a large number of advanced topics which we could study, it seems appropriate to make this offering of Advanced Graphics a seminar course where each seminar participant contracts with the seminar instructor to determine the topics they wish to study and present to the rest of the class participants. Each student will be responsible for selecting and presenting two or three topics and will have one class period for each presentation.

6 Grading

The approximate breakdown on grading will be as follows. The interim project report will be used to determine 20% of the final semester grade. Class project implementation will be used to determine 40% of the final semester grade. Seminar presentations and class participation will be used to determine 20% of the final grade and the final project report and presentation will be used to determine the remaining 20% of the final grade. Although the instructor will not be taking attendance, class participation includes class attendance, participation in discussion and seminar presentations.

7 Possible Seminar Topics

- Graphics Interaction
- Input devices
- Interaction techniques
- Interaction tasks
- User Interface
  - Design
  - Modal
  - Modeless
- Object Modeling
  - Curves and Surfaces
  - Meshes
  - Cubic curves
  - Bicubic surfaces
  - Quadratic Surfaces
- Solid Modeling
  - CSG
  - Boolean Operations

- Colored Light
- Color models
- Reproducing color
- Illumination and Shading
- Lighting models
- Shading models
- Surface features
- Shadows
- Transparency
- Ray Tracing
- Radiosity
- Animation
  - Languages
  - Motion scripting
  - Motion testing