

COURSE DESCRIPTION

Dept., Number	CSCI 440	Course Title	Introduction to Computer Graphics
Semester hours	3	Course Coordinator	Terrence Fries
		URL (if any):	

Current Catalog Description

(Prereq: Computer Science 220) An overview of the elements of 2D and 3D graphics, includes topics on raster graphics, geometrical transformations, parallel and perspective projections for 3D viewing, interaction techniques, representation of curves and surfaces, solid modeling and topics on visual realism. S, odd years.

Textbook

Edward Angel, *Interactive Computer Graphics: A Top-Down Approach Using OpenGL*, 4th Edition, Addison Wesley, 2006.

References

1. To provide students with the fundamental concepts essential for all beginners in the area of computer graphics.
2. To provide an overview of 2D and 3D graphics, interactive techniques, etc.
3. To provide an introduction to more advanced topics such as modeling, morphing, and rendering.

Course Goals

1. To provide students with a historical perspective of AI.
2. To provide students with the basic principles in AI.
3. To provide students with programming experience in an AI language.
4. To allow students to investigate the potential and the limitations of various intelligent systems.

Prerequisites by Topic

1. Data structures
2. Linear algebra
3. Discrete Mathematics
4. Programming experience in C++

Major Topics Covered in the Course

1. Graphics hardware (3 hours)
2. Output primitives (3 hours)
3. Interactive devices and techniques, user interfacing issues (3 hours)
4. Algorithms for points, lines and circles (4 hours)
5. 2D transformations and transformations between coordinate systems (3 hours)
6. 2D Viewing (6 hours)
7. 3D Object Representation, transformations and viewing (6 hours)
8. Visible surface detection (3 hours)
9. Illumination and ray tracing (3 hours)
10. Phong and Gouraud shading (3 hours)

Laboratory projects (specify number of weeks on each)

1. Drawing window with menu for color and shading, display mouse coordinates (2 weeks)
2. 3 dimensional drawing with hidden surfaces (2 weeks)
3. 3-D wire frame torus with adjustable view reference point and fly-by animation (2 weeks)
4. Experiment with lighting and material properties (2 weeks)

Estimate Curriculum Category Content (Semester hours)

Area	Core	Advanced	Area	Core	Advanced
Algorithms		2	Data Structures		
Software Design		0.5	Prog. Languages		
Comp. Arch.					

Oral and Written Communications

Every student is required to submit at least _____ written reports (not including exams, tests, quizzes, or commented programs) of typically _____ pages and to make _____ oral presentations of typically _____ minute's duration. Include only material that is graded for grammar, spelling, style, and so forth, as well as for technical content, completeness, and accuracy.

Social and Ethical Issues

Please list the topics that address the social and ethical implications of computing covered in all course sections. Estimate the class time spent on each topic. In what ways are the students in this course graded on their understanding of these topics (e.g., test questions, essays, oral presentations, and so forth)?

Theoretical Content

Please list the types of theoretical material covered, and estimate the time devoted to such coverage.

Algorithms, 2D and 3D transformations, parallel and perspective projections, image processing (approximately 70% of the course).

Problem Analysis

Please describe the analysis experiences common to all course sections.

Each program assignment requires problem analysis.

Solution Design

Please describe the design experiences common to all course sections.

Each program assignment requires a formal design document.