

Syllabus

CAP 4720 : Computer Graphics

Course Description:

Math for Computer Graphics, Visibility and Shading, Graphics and Data Structure, Curves and Surfaces, GPU Programming, Graphics API.

Prerequisites

COP 3530 (Data structures and algorithms); and MAC 2147(knowledge of elementary algebra, geometry, trigonometry and elementary calculus).

Course Outline:

1. Mathematical tools for Computer Graphics
2. Geometric and Viewing Transformations
3. Graphics API (OpenGL), GPU Programming
4. Rasterization and Visible Surface Algorithms
5. Reflection models and Surface Shading
6. Texture Mapping, Anti-aliasing
7. Data Structure for rendering and scene modeling
8. Curves and Surfaces
9. Advanced rendering techniques

Computing Resource Requirement:

Access to current generation PC equipped with a commodity graphics card (preferably one supporting fragment shader).

Objectives:

This course will provide an introduction to computer graphics for students who wish to learn the basic principles and techniques of the field and want to write applications themselves. The students will learn graphics programming to create synthetic images/visuals.

Evaluation Procedures:

Periodical tests.

Regular programming projects to create synthetic images using a graphics API.

What this course is not:

This course is not a training course for any graphics application software. This course is not specific to any one application of Computer Graphics. This is not a computer game design course.