

Fall 2009

## CSC 370: Computer Graphics

*This course focuses on learning concepts and practicing programming skills concerning 2D and 3D computer graphics.*

### Preliminary Schedule:

Bits, Bytes, & Pixels

Human Visual System and Color Representation

Image Storage and Memory Issues

Introductory 2-D Graphics & Basic Rasterization

Bresenham's Line Algorithm

Mid-point Circle Algorithm

Cohen-Sutherland Clipping

Topics in Processing and Nodebox

Matrices and Vectors

Affine Transformations

Transformation Stack in Processing and OpenGL

Representation of Objects in 3-D Space

Concepts and Basic Organization of OpenGL and Hardware Accelerated Graphics

GL, GLU, and GLUT Libraries

Basic C/C++ Program Concepts and Structure

Basic OpenGL Program Structure and GLUT Callbacks

Single versus Double Buffering

Transformations in 3-D Space and in OpenGL

MODELVIEW and PROJECTION Matrices

GL "camera", gllookat(), direct matrix manipulation

Basics of .obj files

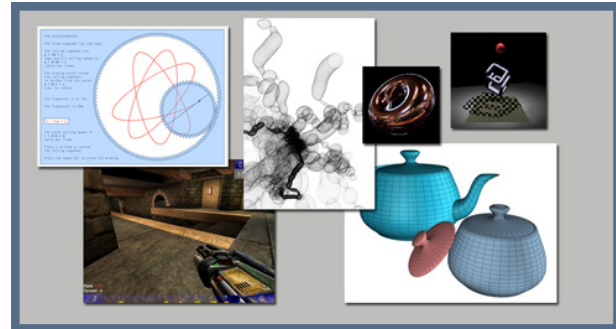
Basic GL Lighting & Shading

Phong Lighting Model

Computing Diffuse, Specular, and Ambient components

Setting Lighting and Shading Models and Attributes in OpenGL

Types of Lights in OpenGL



### Tentative Schedule & Possible Topics:

Advanced drawing and shading techniques in OpenGL

L-Systems

Fractals

Particle Systems

Basic Ray-Tracing

OpenGL implementations & recent additions

OpenGL ES