

CS 4250 : COMPUTER GRAPHICS

<i>Semester Hours:</i>	3.0	<i>Contact Hours:</i> 3
<i>Coordinator:</i>	Jong Kwan "Jake" Lee	
<i>Text:</i>	Computer Graphics with OpenGL	
<i>Author(s):</i>	HEARN, BAKER, AND CARITHERS	
<i>Year:</i>	2010	

SPECIFIC COURSE INFORMATION

Catalog Description:

Graphic I-O devices; two-dimensional and three-dimensional display techniques; display processors; clipping and windowing; hidden-line removal; data structures for graphics. Prerequisites: CS 3350 and one of MATH 2220, MATH 3220, MATH 3320. Approved for distance education.

Course type: **ELECTIVE**

SPECIFIC COURSE GOALS

- I know how to draw the basic primitives (e.g., point, line, polygons) using OpenGL.
- I can explain how the Bresenham line scan conversion algorithm works.
- I am able to produce simple animation using OpenGL.
- I know how 2D transformations (e.g., 2D translation, 2D rotations, 2D scaling) work in graphics.
- I know how 3D transformation (e.g., 3D translation, 3D rotations, 3D scaling) work in graphics.
- I understand how simple line and polygon clipping algorithms work.
- I know how spline-based modeling works in graphics.

LIST OF TOPICS COVERED

- Introduction
 - Graphics applications
 - Languages for CG

- Graphics hardware
 - Color and color lookup tables
- Raster Graphics & Raster Graphics Toolkits
 - Standard primitives
 - Primitive generation, e.g., Bresenham
 - Filling algorithms
 - Drawing styles
 - BitBlt
- Interactive Graphics
 - User interface considerations
 - Input devices
 - Interactive programming techniques
- 2D & 3D Graphics
 - Modeling transformation
 - Coordinate systems
 - Clipping
 - Windows and Viewports
 - Wireframe models
 - Animation Techniques
- 3D Realism Techniques
 - Back face removal
 - Viewing issues
 - Shading and smoothing techniques
 - Lighting issues
 - Introduction to Ray Tracing
- Additional Topics as time permits