CS 5250 : COMPUTER GRAPHICS

Semester Hours:	3.0	*Contact Hours:* 3
Coordinator:	Jong Kwan "Jake" Lee	
Text:	Computer Graphics with OpenGL	
Author(s):	HEARN, BAKER, AND CARITHERS	
Year:	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: Full Admission to MS in CS program or consent of department. 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.
- I can analyze relevant research and communicate my findings.

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