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. Prerequisite: Full Admission to MS in CS program or consent of department is required for enrollment.

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
  o Graphics applications
  o Languages for CG
  o Graphics hardware
  o Color and color lookup tables
• Raster Graphics & Raster Graphics Toolkits
  o 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