CS 4250 : 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: CS 3350 and one of MATH 2220, MATH 3220, MATH 3320.

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