

**1. Course number and name**

CptS 442: Computer Graphics

**2. Credits and contact hours**

3 credits, 3 lecture hours

**3. Instructor's or course coordinator's name**

Robert R. Lewis

**4. Textbook, title, author, and year**

Wright, Lipchak, and Haemel. *OpenGL SuperBible* (5th ed.). Addison-Wesley. ISBN 978-0321712615.

*Other supplemental materials*

<<https://www.khronos.org/opengl>> (The most recent OpenGL on-line specification.)

**5. Specific course information**

a. *Catalog description:* Raster operations; transformations and viewing; geometric modeling; visibility and shading; color.

b. *Prerequisites or corequisites:* CptS 223, CptS 224, Math 220

**6. Specific goals for the course**

By the end of the course, students will be able to

- Create code to realize geometrical concepts (6a, 2g)
- Describe the basics of modern graphics hardware
- Demonstrate a knowledge of the OpenGL API (6a)
- Write simple shaders in GLSL for a graphics processing unit (1c)
- Incrementally build a large, non-trivial 3D, object-oriented graphics program (2g)
- Analyze a running graphics program for defects and fix them in code (2e)

**7. Brief list of topics to be covered**

These are the topics the course will cover. We will not, however, cover them in strict sequence. Some topics we will revisit multiple times in increasing detail:

- Introduction
- (Programmable) Graphics Hardware
- OpenGL Basics
- Drawing Lines
- Filling Polygons
- Using Vectors
- Clipping Things
- Transforms
- Meshes
- Viewing
- Lighting
- Textures
- Curves and Surfaces

- Other topics we may discuss as time permits:
  - Fractals
  - Color
  - Shadows