Course Outline:

Introduction: History of computer graphics, graphics architectures and software, imaging: pinhole camera,human vision, synthetic camera, modeling vs rendering

OpenGL: architecture, displaying simple two-dimensional geometric objects, positioning systems, working in a windowed environment

Color: Color perception, color models (RGB, CMY, HLS), color transformations. Color in OpenGL. RGB and

Indexed color:

Input: working in a network environment, client-server computing; input measure, event, sample and request input, using callbacks, picking.

Geometric transformations: affine transformations (translation, rotation, scaling, shear), homogeneous coordinates, concatenation, current transformation and matrix stacks.

Three dimensional graphics: classical three dimensional viewing,specifying views, affine transformation in 3D, projective transformations.

Ray Tracing:

Shading: illumination and surface modeling, Phong shading model, polygon shading.

Rasterization: line drawing via Bresenham's algorithm, clipping, polygonal fill, BitBlt. Introduction to hidden surface removal (z buffer).

Discrete Techniques: buffers, bitblt, reading and writing bitmaps and pixelmaps, texture mapping, compositing.

Advanced Topics: