

THIS IS A REFERENCE SYLLABUS DESCRIBING AN NKU COURSE IN GENERAL. ENROLLED STUDENTS SHOULD CONSULT THE ACTUAL SYLLABUS OF THE COURSE IN WHICH THEY ARE REGISTERED.

CSC 480 Computer Graphics

CATALOG DESCRIPTION:

CSC 480 Computer Graphics (3,0,3) Basic concepts of two-and three-dimensional graphics including incremental methods, geometric transformations, windowing and clipping, hidden line and surface algorithms, and animations. PREREQ: C or better in CSC 364 and MAT 234.

LAST TAUGHT: Fall 2008 (K. Kirby)

SCHEDULED LAB USAGE: None

STUDENT BACKGROUND EXPECTATIONS:

1. Familiarity with the mathematics of vectors and matrices (from MAT 234: Linear Algebra).
2. Experience coding moderately complex tree-like data structures in an object-oriented programming language (from CSC 364: Data Structures and Algorithms).

CORE TOPICS COVERED:

- Introduction and overview
- Getting started with 3D programming: OpenGL
- Review of relevant linear algebra (vectors and matrices)
- Transformation of objects
- Meshes
- Matrix stacking
- Viewing and projective geometry
- Illumination and shading
- Texture mapping and pixel operations
- Clipping and rasterization
- Overview of object-oriented scene graphs

MOST RECENT TEXTBOOK USED :

Interactive Computer Graphics: A Top-Down Approach Using OpenGL, 5th Edition, E. Angel (Addison-Wesley, 2009).
Chapters Covered: 1-8, 10, and Appendices B and C.

SOFTWARE REQUIRED:

Any current C++ compiler.
OpenGL and GLUT libraries (free).
Blender - 3D modeling software (free).

STUDENT WORK

Programming assignments using OpenGL and in-class exams.

LEARNER OUTCOMES

Students will be able to...

1. Explain the elements of affine and projective geometry that underlie modern 3D graphics.
2. Write programs that use the OpenGL library to create efficient interactive 3D graphics programs.
3. Explain the elements of modern real-time pipelined 3D graphics, such as matrix stacking, illumination, shading, and texture mapping.
4. Implement low-level pixel-based algorithms as executed on contemporary graphics processing units.

CROSS-LISTINGS

CSC 580