



NKU CSC 680 – Spring 2005

Advanced Computer Graphics

A study of the mathematics and software design involved in advanced computer graphics, with an emphasis on real time rendering and game engines.

instructor Kevin Kirby, 340 ST (572-5377, kirby@nku.edu). www.nku.edu/~kirby/
Office hours: 9:30-11 TWR or by appointment.

I'm usually around and available. If you're in the building, stop by. If not, call first.

prerequisites CSC 580 *Computer Graphics* or equivalent.

Expected background: You should be confident in C++ programming, have experience using OpenGL in C++, be comfortable with linear algebra and basic affine and projective geometry, and be familiar with the fundamental concepts and algorithms in pipelined 3D computer graphics.

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| <p>topics</p> <ol style="list-style-type: none">1. Moving from OpenGL to DirectX Graphics2. Advanced geometrical methods: quaternions and distance methods3. Mesh creation tools4. Advanced DirectX techniques5. Object-oriented scene graph case studies: Java3D6. Clipping and collision detection7. Curves and surfaces8. Virtual physics9. Animation of characters |
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textbooks *3D Game Engine Design*. by D. H. Eberly (Morgan-Kaufman, 2001).
Intro. to 3D Game Programming With DirectX 9.0 by F.D. Luna (Wordware, 2003). [optional]
The Java 3D API Tutorial: <http://developer.java.sun.com/developer/onlineTraining/java3d/>

- coursework**
1. Five programming projects (60%)
 - 2 in DirectX9 in C++
 - 1 in Java3D
 - 1 (final project) in DirectX9 (C++ or C#), OpenGL (C++), or Java3D (your choice)
 2. One homework problem set (10%)
 3. A midterm (10%).
 4. A final exam (20%)

Undergraduates registered for CSC 499 will only do the items #1 and #2.

drop date March 28 is the last day to drop with a grade of "W".

platform requirements Microsoft Visual Studio 2003, available from the NKU CS department.
Microsoft DirectX 9c SDK (Dec. 2004), from instructor or download from Microsoft.
Java2 SE 1.4 or higher, available from the NKU CS department or download from Sun.
Java3D 1.3.1 Windows SDK packages, available from the instructor or download from Sun.

on dishonesty Assignments must be done individually unless stated otherwise on the handout. Evidence of collaboration in coding may result in a grade of F for the course.

Note: "The instructor reserves the right to alter the syllabus if circumstances dictate."