

NKU CSC 480 Spring 2006

# Computer Graphics

*The data structures, algorithms, mathematics and design practices that lie behind contemporary graphics software, with a strong emphasis on 3D.*

**Kevin G. Kirby**  
[www.nku.edu/~kirby](http://www.nku.edu/~kirby)  
 kirby@nku.edu  
 (859) 572-6544

**Spring 2006 Office Hours**  
 9-10am M-F & 5-6pm TR  
 or by appointment.

Balloons remaining: 85. Time: 105.3 sec.  
 artifacts rendered: 4 xyz= ( 0.097, 3.659, 3.000 ) speed= 2.6 azimuth=177.6 deg. t= 81.9 [29.8 fps]

**prerequisites** MAT 225 (*Linear Algebra*) and CSC 364 (*Data Structures*).

<b>topics</b>	<ol style="list-style-type: none"> <li>1. Introduction and overview</li> <li>2. Getting started with OpenGL</li> <li>3. Review of relevant linear algebra</li> <li>4. Transformation of objects</li> <li>5. Meshes</li> <li>6. Graphics and XML: an introduction to SVG</li> <li>7. Matrix stacking and virtual robotics</li> <li>8. Viewing and projective geometry</li> <li>9. Illumination and shading</li> <li>10. Texture mapping and pixel operations</li> <li>11. Clipping and rasterization</li> <li>12. Object-oriented scene graphs</li> </ol>
---------------	--

**textbook** *Interactive Computer Graphics: A Top-Down Approach Using OpenGL*, Fourth Edition, E. Angel (Addison-Wesley, 2006).

We will cover the following chapters: 1-8, part of 10, and Appendices B and C.

**other resources** Some additional readings (in hardcopy and/or in Adobe PDF format) will be made available online as the course proceeds.

There will be frequent handouts and code examples, also available on the course website.

You do not need to buy any other books for this course. If you *want* to buy one, I would recommend buying the classic OpenGL “red book”: *The OpenGL Programming Guide, 5<sup>th</sup> Edition* (Addison-Wesley, 2006).

**coursework** About 7 solo assignments, both pencil/paper and C/C++ code (65%).  
 A midterm (15%).  
 A comprehensive final exam – Thursday, May 4 10:10 –12:10 (20%)

**drop date** March 27 is the last date to drop with a grade of “W”.

**platform requirements** A reasonably up-to-standard C++ compiler, with OpenGL and GLUT 3 or later. All our code will be (nearly) platform independent.

If you are using Windows: Use Visual Studio 2003 or later. (Visual C++ 6 is substandard.)

**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. Protect your work.

**general comments** Attendance is required; class participation is important and can affect your grade. Our 75 minute sessions are meant to be dynamic and productive.

We will use C++ for this course, but you do not have to be a C++ expert (or graduate of CSC 402) to do the projects.

I will not debug your code, but I will happily give some gentle guidance when you're stuck. Feel free to stop by.

Programs are graded on style and design as well as on nominal correctness. Take pride in your work and polish it to a high gloss. Start early, test continually.

Some assignments may be evaluated "live" – you will come and demo your code for me; we will walk through it together.

Ask questions.

Have fun.

**the sequel?** Following on the heels of this course is CSC 680 *Advanced Graphics*, with a strong real-time / game engine emphasis, including an introduction to DirectX. Undergraduates may register for it as CSC 49x with permission of the instructor.

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