**CS486**
**Lab 3: Basics of 3D programming**
**Due: Wednesday, March 15th**

*Objectives:*
• To get started programming in 3D
• To work with the basics of lighting and rotations in openGL
•To create a strategy for converting Hill-style polygonal models to openGL geometry calls

*The Lab:*

This lab is based on three programs:
redshape.c - display a red shape
axis.c - use the mouse to rotate a shape
rotatesphere.c - animate a 3D shape
We will use redshape and axis primarily. You will modify both of them in the lab.
The * items should be in your final programs.

Part I. The glut shapes (with redshape.c)
1. Play with the shape calls. Change the wiresphere call to glutWireSphere(1.0, 20.0, 5,0); -- see what happens.
2.* Add two new glut shapes (find the man pages on the internet).

Part II. The light (with redshape.c)
1. Set the light to another color and see the result.
2. Move the light to another quadrant so you can light the shape differently.
3*. Add two additional lights, one green and one blue, from different quadrants.

Part III. The shape (with axis.c)
1.* Modify the shape in the axis.c to be a tetrahedron (a pyramid with a 3 sided base).
2.* Add a second option to axis.c to read the shape in from a file which stores the model as a faceted polyhedron. The file should have vertex, normal and face information.

Part III. The view volume (with axis.c)
1. Play with the parameters in gluPerspective so you understand what each one does.
2. * Modify axis.c so the mouse X controls FOV.

Part IV. The camera position (with redshape.c)
1. *Add menu items to select a front, top and side view of the object. This will mean setting the eye position (the first three parameters in gluLookAt) to go down the Z, X and Y axes. You may have to modify the Up vector, particularly in the case of the Y axis.