1. *Course number and name*

   CSCI 446: Computer Graphics I

2. *Credits, contact hours*

   3 credits, 45 contact hours

3. *Instructors name*

   John Nordlie

   Upson II, Rm 366A
   john.nordlie@und.edu
   https://nordlie.cs.und.edu

4. *Text book, title, author, and year*
   a. *Suggested: Computer Graphics using OpenGL*, F. S. Hill and Stephan M. Kelley, 2006
   b. *Other supplemental materials*

      OpenGL handouts at https://nordlie.cs.und.edu/cs446
      https://www.geeksforgeeks.org/computer-graphics/getting-started-with-opengl/
      https://learnopengl.com/

5. *Specific course information*
   a. *Brief description of the content of the course (catalog description)*

      Introduction to computer graphics. Topics include raster scan graphics, 2D and 3D representations, affine transformations, light and color, texture mapping, image processing, ray-tracing, and computer animation. Team-based weekly homework develops a 4 minute computer animation. Prerequisites: CSCI 242, CSCI 363, and MATH 166. F, odd years
   b. *Prerequisites or co-requisites*

      Prerequisites: CSCI 242, CSCI 363, and MATH 166
   c. *Indicate whether a required, elective, or selected elective course in the program*

      Elective

6. *Specific goals for the course*
   a. *Specific outcomes of instruction*

      - Understand raster scan graphics (line drawing, polygons, and curve theory).
      - Understand geometrical (affine) transformations.
      - Understand color theory.
      - Understand 3D graphics (rendering, texture mapping, and ray tracing).
      - Understand the types of animation.
      - Become proficient on OpenGL programming.

b. *Explicitly indicate which of the student outcomes listed in criterion 3 or any other outcomes are addressed by the course*
    - Student Outcome (1)
    - Student Outcome (2)
    - Student Outcome (5)
    - Student Outcome (6)

7. *Brief list of topics to be covered*
    - OpenGL programming
    - Animation types (rigid body, particle, spring mass, etc)
    - Mid-point line and circle algorithms
    - Affine transformations
    - Types of 3D views (projections)
    - Meshes, curves, surfaces, and interpolation
    - Hidden surfaces
    - Light and color theory
    - Basic image processing
    - Image compression