Principles of Computer Graphics

CSCI 4631/5631 Section 001
Fall Semester 2016

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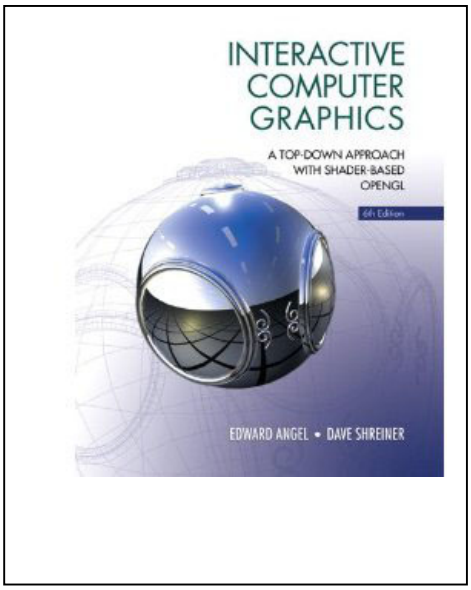
Meets: **12:30PM - 1:45 PM T,Th in Math 112. 5631 (graduate) section will have one extra hour of meeting time per week TBD**

Office Hours: M,W 1:00PM-3:00PM, Th 9:30AM-11:30M. Office hours will be conducted in Math 312A. Other times by appointment only

Prerequisite: CSCI 2125 and MATH 3511 with a grade of C or better or consent of department.

Text: Interactive Computer Graphics: A Top-Down Approach Using OpenGL (Fifth Edition) Edward Angel



Course Content:

This course is an introductory course in Computer Graphics with an emphasis on techniques, algorithms and the mathematics involved in modern computer graphics. The topics covered will be (we reserve the right to adjust as the term progresses):

- Graphics hardware
- Graphics applications
- Line and Circle Drawing
- Polygons, Polygon clipping
- Area Filling
- Anti-Aliasing
- Basic Vector Algebra (2D and 3D transformations, homogenous coordinates, mapping)
- 3D Viewing algorithms, 3D Clipping
- Input Devices and Interaction Techniques
- Visible Surface Algorithms and Illumination Models
- Color, Visual Realism, Curves, Surfaces

Grading:

(1) Homework/programming assignments will consist of **60%** of your final grade; and tests **30%**. The other **10%** will be based on your class attendance and participation, and I reserve the right to give pop quizzes, which will factor into that 10%. The test component will be computed as the mean of one in-class, closed-book announced midterm plus the final exam grade. **It expected that, unless otherwise stated, that you turn in your own work and not a collaborative effort.**

(3) All work is graded on a numerical (percentage) basis. The correspondence between numerical and letter grades is given as follows:

A: >= 90,
B: 80 - 89,
C: 70 - 79,
D: 50 - 69,
F: < 50.

(4) It is expected that all homework will be turned in on time. Lateness penalties are:

- 1 day late - 10% off;
- 2 days late - 20% off;
- 3 days late - 40% off;
- >3 days late – *fuggheddaboutit!!*

Note: We count school days (Sundays and holidays are not included).

(5) **Homework Submission:** Homework submissions through gitlab.com will be **required** for this course. Git is a tool commonly used by professional programmers for source code control, and you will be trained in the first week to install and use it. Effective use of gitlab will be the responsibility of the student. No exceptions. You will also be **required** to submit a hardcopy of your work. Failure to follow these requirements will result in a **grade of zero**.

(6) No make-ups for graded work (either tests or homework) will be given except for a legitimate (*e.g.*, medical) reasons.

(7) Questions about the grading of student work should be raised within 72 hours of its return. After that time frame, issues raised will risk not being entertained.

(8) Students should retain all returned graded work, in case there are issues raised about the grade.

(9) The "I" grade (for Incomplete) is given only in exceptional circumstances, (*e.g.* missing the final exam because of a surgery).

Expected Outcomes:

Upon completion of this course, students will:

- Understand how graphics hardware works, and what it does
- Understand graphics primitives, and efficient algorithms in graphics
- Understand and be able to apply the underlying mathematics of transformations and projections in 2D and 3D
- Understand the virtual camera / viewing volume model of OpenGL
- Understand be able to implement coloring and shading models
- Be able to implement vertex and fragment shaders
- Understand the graphics pipeline and its interaction with shaders, and hidden surface cullers
- Be able to write programs to display graphics primitives, either from data, or procedurally generated.
- Understand the underlying mathematics, and implementation of curves and surfaces in typical OpenGL programs.

Graduate (5631) Section:

The graduate section of this course will meet one extra hour per week beyond that of the undergraduate section. During this time the students will provided either a more in-depth analysis of the material or we will study primary literature related to the concepts being discussed in the main lecture. Graduate students may be expected to answer additional, advanced, questions on exams, provide the instructor with additional, more advanced components in graded work, and will be expected to give a presentation as part of their grade (10% of final grade, homeworks for graduate students will be devalued to 50% of final grade, and the rest of the grade components remain as standard for the course)

Academic Dishonesty:

Finally, we must call your attention to the University's policies regarding academic Dishonesty: *Academic integrity is fundamental to the process of learning and evaluating academic performance. Academic dishonesty will not be tolerated. Academic dishonesty includes, but is not limited to, the following: cheating, plagiarism, tampering with academic records and examinations, falsifying identity, and being an accessory to acts of academic dishonesty. Refer to the Student Code of Conduct for further information. The Code is available online at http://www.studentaffairs.uno.edu.* In the event of academic dishonesty, **the student will be assigned a grade of 0** on the exam or exercise, the student will be informed in writing of the action taken, and **a copy of this letter will be sent to the Assistant Dean for Special Student Services**.

Students with Disabilities:

It is University policy to provide, on a flexible and individualized basis, reasonable accommodations to students who have disabilities that may affect their ability to

participate in course activities or to meet course requirements. Students with disabilities are encouraged to contact their instructors and/or the Office of Disability Services to discuss their individual needs for accommodations.