

COMPUTER GRAPHICS

CS 440: Course Description

MWF 9:00-9:50 am. Hebeler 106, Lab R Hebeler 209.

Instructor: [Dr. Boris Kovalerchuk](#)

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Teaching assistant: Don Whalen whalend@cwu.edu

Hebeler 214B Office hours: MWF 4:00-5:00 PM.
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Objectives: The principal objective of this course is to introduce you to some of the basic concepts, algorithms, and problems in the field of computer graphics. A survey of graphics software and hardware systems will be included. We will also discuss topics in the fields of scientific visualization and image processing.

Student learning outcome: ability to write computer graphics programs using OpenGL/Java, abilities to develop computer graphics algorithms for 2-D and 3-D graphics, knowledge of mathematical background of computer graphics, vector clipping technique, crossing lines, finding specific points in polygons, dot and cross product, Matrix technique for rotation, scaling and translation.

NOTE: this class may cover some material not given in the text. It is important that you attend class in order to be exposed to the material for which you are responsible.

Prerequisite: CS302, CS325.

Knowledge of analytic geometry, linear algebra, vector manipulation, and numerical analysis will be helpful.

[Basic math](#)

[Midterm study guide](#)

Textbook: F.S. Hill, [Computer Graphics](#) using open GL, Prentice Hall, 2001. [Source code](#)

Optional text: OpenGL Programming Guide: The Official Guide to Learning OpenGL, Version 1.2, 3/e

OpenGL Architecture Review Board, Mason Woo, Jackie Neider, Tom Davis, Dave Shreiner, 1999, Addison-Wesley
ISBN 0-201-60458-2

Reference books:

[Angel, *Interactive Computer Graphics. A top-down approach with Open GL*](#), 2nd Edition, Addison-Wesley (2000)

[Programs from Angel's book](#)

[Hearn & Baker, *Computer Graphics*](#), 2nd Edition (C Version), Prentice-Hall (1997)

[Programs appearing in text:, C code](#)

[Hearn & Baker: OpenGL Supplement](#)

Hearn & Baker [Course Objectives](#).

[Schedule:](#) This is subject to change.

[Study guide for final](#)

[Homework assignments.](#) There will be 3 to 6 homework assignments. They will be graded by the instructor or TA and posted in your directory.

Typical homework assignments will be reading the textbook and work on exercises from the textbook and related exercised generated by the instructor. If you want to use Java consult about possible modification of the C++ /OpenGL code from the book with TA.

Your homework should be clearly and carefully written. Plots, drawings, and other graphical representations are highly recommended.

Programming assignments: There will be 3 programming assignments. Programs may be written in C++ (using OpenGL) or Java (must run on an accessible Web page). Neither C++ nor Java will be taught in class. You can find programming assignments on **alp/cs440dat/**

ProgAssign directory

Due dates:

Programming assignment #1 • October 19

Programming assignment #2 • November 2

Programming assignment #3 • November 28

The source code (C++ or Java) should be in your class directory. They will be compiled and tested by the instructor/TA, and you will receive a message in your class directory concerning your grade.

All programs are expected to incorporate good object-oriented design and programming style. Be sure to include your name, the programming language of the program, and the compiler you used to compile and test your program as part of your heading comments. Any unusual features of the program should be discussed there as well.

Course Project: We will discuss your suggestions and pilot work for the project by October 20. After that time you will work on the approved project and present your results to the class on November 30. If you took cs427 you may try to visualize algorithms from cs427 in cs440.

Assignment Policies

Exams: The midterm exam will be given during the quarter as well as a comprehensive final exam.

Questions on the exams will be based on topics covered in lectures and assignments.

Final Exam: The final exam will be comprehensive.

Grading: The overall grade in the course will be determined as follows:

Homework Assignments	10 %
Programming Assignments	35 %
Midterm Test	20 %
Course Project (small)	10 %
Final Exam (can be substituted by a large project)	25%

Homework and programming assignments are to be individual efforts, not group projects. While you may discuss the problems with each other, the assignment turned in should be your own work. Two students can work on joint course project, but individual responsibilities should be clearly stated in the project description submitted to the instructor.

Additional material:

[OpenGL: Getting Started](#)

[Computer graphics \(UNC\)](#)

Graphics Formats

[What is Computer Graphics?](#)

[Computer Graphics Topics](#) (Georgia Tech)

[Computer Graphics](#) (Georgia Tech)

[A Standard Default Color Space for the Internet - sRGB](#)

SIGGRAPH Conference Courses

[Digital truth](#)

[Dolphin](#)

[Titanic](#)

[Baby](#) Baby movie (see pic\cs440)

[DNA](#)

Northridge movie (see pic/cs440)

[Bit operations](#)

[Bitmap](#)

[Alpha](#)

[pixel -OpenGL](#)
