CSCI 440 - Introduction to Computer Graphics
Fall 2018

Department of Computer Science and Quantitative Methods
College of Business Administration
Winthrop University

Instructor: R. Stephen Dannelly, PhD

Office: 315 Thurmond

Email: dannellys@winthrop.edu

Home Page: **faculty.winthrop.edu/dannellys/csci440**

Office Hours: Tuesdays and Thursdays, 1:00-4:00
                see homepage for weekly schedule

Catalog Description
The study of the geometry, mathematics, algorithms, and software design techniques of computer graphics.

Course Objectives
After successfully completing this course, the student will:
- understand common graphics principles, such as the graphics pipeline, transformations, lighting and shading, hidden surface removal, projections, and more
- demonstrate the ability to perform manual transformations (matrix manipulations)
- write source code in WebGL to perform basic operations such as transformations and lighting effects

Prerequisites
- MATH 101 or 201
- MATH 261 or 300
- grade of C- or better in CSCI 208
- All CSCI courses numbered above 299 have a prerequisite of junior status, an overall GPA of at least 2.00 and a grade of C- or better in HMXP 102.

Textbook - highly recommended, but not required

Interactive Computer Graphics, A Top-Down Approach Using WebGL, 7th Edition, by Edward Angel, Addison Wesley Inc.
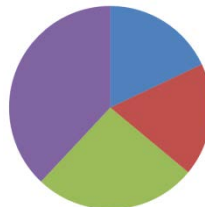
Course Grades

Final grades for this course will be based on a 10-point scale. In other words,
        90.00 to 100 is an A,
        80.00 to 89.99 is a B,
        etc...

Exam One	18%
Exam Two	18%
Final Exam	26%
Programming Assignments	38%

Work submitted late will lose 10%, plus 10% for every 12-hours submitted late. For example, if an assignment is due Thursday at 2:00pm and is submitted at 2:10pm, it loses 10%. Work submitted at 12:30am on Friday would lose 20%.

Grades for programming work will be assigned using the following rubric:

	Excellent	Good	Fair	Unsatisfactory
Functionality 40%	The program works and meets or exceeds all specifications.	The program works and produces the correct results and displays them correctly. It also meets most of the other specifications.	The program produces correct results but does not display them correctly.	The program performs tasks that it was not supposed to perform.
Efficiency 20%	The code is extremely efficient without sacrificing readability and understanding.	The code is fairly efficient without sacrificing readability and understanding.	The code is brute force and unnecessarily long.	The code is huge, inefficient, or appears to be patched together.
Robustness 20%	Program correctly handles all specified test cases and additional special cases. Program contains error checking code.	Program executes without errors and correctly handles most special cases. Thorough testing has been completed.	Program executes without errors for pre-specified test cases.	Program does not execute due to errors. No evidence of testing.
Documentation 20%	Clear and complete documentation. The purpose and constraints of every variable and subroutine are described. Comments for code segments make the code easy to follow.	The purpose of all variables is clearly explained. The purpose of each subroutine is described.	Most variables and subroutines are commented. Comments provide some assistance with understanding the code.	No comments are included or other documentation provided.

Cheating

When working in a professional software development environment it is expected that you will frequently consult with your colleagues regarding problems you encounter. But in an educational environment, each student is expected to do **all** of his/her own work.

In freshmen courses, such as CSCI 207, you were encouraged to help each other debug code. That was because overcoming syntax was a problem common to all students and you could frequently learn from others' mistakes. In sophomore courses, such as 271, debugging help was not allowed while sharing design ideas was allowed. In this upper-division course, you are expected to be able to design the entire application by yourself and you are expected to be proficient at debugging your own code.

You are still allowed to discuss problems at a high level, but sharing code, pseudo-code, or algorithms is not acceptable. For example, you are allowed to tell a classmate, "I couldn't determine if my matrix multiplication function was working correctly, so I put that code in a separate program and wrote the output values into the browser as an HTML table." But showing a classmate your code to do any of that is considered cheating.

Topics
- WebGL programming
- the graphics pipeline
- input and event processing
- matrix mathematics for transformations
- parallel and perspective viewing
- lights, shadows, and shading
- clipping
- blending and fog

See course web site for day-by-day textbook reading assignments, programming assignments, lecture note outlines, and exam dates.

Final Exam - 11:30 a.m., Tuesday, December 11, 2018

COLLEGE OF BUSINESS EXPECTATIONS REGARDING
PROFESSIONALISM IN THE CLASSROOM

The College of Business Administration is a professional organization with a well-defined and widely disseminated mission of student development. Accordingly, each class represents a gathering of professionals and professionals-in-training. The instructor's job as a professional is to deliver quality instruction in each class, to start and end each class on time, to be responsive to student perspectives, issues and questions, and to treat each student respectfully. The student's job, as a professional-in-training is to be prepared for class, to be on time, to attend all classes, and to be respectful of others in the classroom.

In accordance with and pursuant to these roles the following guidelines were established to specify to students (both present and prospective) faculty expectations regarding their behaviors

1. **Students will attend all class meetings.** There are no automatically "excused" absences. In the event that you will be unable to attend a class session, you should inform your professor in advance as a matter of professional courtesy just as you would/should with an employer.

2. **Students will arrive in advance of the beginning of the class session.** Late arrivals are disruptive, inconsiderate and unprofessional. Professors may make arrangements for delinquents, but are not obliged to do so. Those not present at the beginning of the classroom period will be considered absent.

3. **Students will not converse among themselves during class except when instructed to do so.** When a student creates a disturbance in the classroom, instructors will either ask the student to desist immediately or speak to the student at the conclusion of class. Repeat offenders will be sanctioned.

4. **Students will not leave class before its conclusion.** Early departures are disruptive, inconsiderate and unprofessional. Professors may make arrangements under some circumstance, but are not obliged to do so. Those not present at the conclusion of the classroom session will be considered absent.

5. **Students will have procured textbook/materials prior to the first class.** Instruction will begin with the first class meeting and consume the remainder of the class period.

STUDENTS WITH DISABILITIES

Winthrop University is dedicated to providing access to education. If you have a disability and require specific accommodations to complete this course, contact the Office of Disability Services (ODS) at 803-323-3290. Once you have your official notice of accommodations from the Office of Disability Services, please inform me as early as possible in the semester.

SYLLABUS CHANGE POLICY

The grading and attendance policies for this course, as described above, will not change and are adhered to strictly. The schedule of class meetings may change due to unexpected events such as class cancellation due to weather.

ATTENDANCE POLICY

Because programming assignments and the final exam will be based on the content of lectures, not a textbook or the web lecture notes, it will very difficult for students to successfully complete the graded work without coming to class.

ASSESSMENT

No student performance metrics from this course are used to assess any program.