COLLEGE *of* ENGINEERING AND PHYSICAL SCIENCES

SCHOOL OF COMPUTER SCIENCE

CIS*4800 Computer Graphics W18 (3-1) [0.50]
Course Outline

Website: skeeter.socs.uoguelph.ca/~matsakis/CIS4800
Prerequisites: CIS*3110, (CIS*3750 or CIS*3760)

Lectures: Mon, Wed, Fri, 2:30pm-3:20pm, MCKN 228
Instructor: Pascal Matsakis, pmatsaki@uoguelph.ca, MCKN 900D
Office Hour (for help with the lecture material and other matters):
Wed, 3:30pm-4:30pm, MCKN 900D

Lab: Mon, 4:30pm-5:20pm, MCKN 227
Teaching Assistant: Jason Kemp, ta4800@socs.uoguelph.ca
Office Hour (for all programming-related questions): TBD

Description

Synopsis

This course is an introduction to computer graphics and deals with the processes involved in converting a mathematical or geometric description of an object into a visualization that simulates the appearance of a real object.

Keywords

3D geometry, affine transformations, 3D object modeling, polygon meshes, voxels, octrees and BSP trees, rendering strategies, shading algorithms, shadow algorithms, local reflection models, hidden surface removal algorithms, Z-buffer, texture mapping, graphics pipeline, local, world and view coordinate systems, rasterization, global illumination algorithms, ray tracing...

Learning Outcomes

On successful completion of this course, students will be able to:

- demonstrate knowledge and understanding of the core concepts of computer graphics;
- implement classic computer graphics algorithms;
- develop programs to model and render simple 3D objects without the assistance of any computer graphics library;
- write OpenGL programs to model and render simple 3D scenes and animations.

Textbooks

The textbooks below are recommended for those with special interest in computer graphics, but none is required for the course.

- Angel and Shreiner, *Interactive Computer Graphics: A Top-Down Approach with Shader-Based OpenGL*, Pearson, Sixth Edition, 2011
- Lengyel, *Mathematics for 3D Game Programming and Computer Graphics*, Course Technology PTR, Third Edition, 2011
- Rost et al., *OpenGL Shading Language*, Addison-Wesley Professional, Third Edition, 2009
- Shreiner et al., *OpenGL Programming Guide: The Official Guide to Learning OpenGL, Version 4.3*, Addison-Wesley Professional, Eighth Edition, 2013
- Watt, *3D Computer Graphics*, Addison-Wesley, Third Edition, 1999

Assessment

Grading Components

Programming assignments:	40%
Midterm examination:	30%
Final examination:	30%

There will be 5 assignments. Each assignment counts for 8% of the final grade. Assignments 1, 2, 3 and 4: the program documentation counts for 4% and the program itself (marked when demoed) for 4%. Assignment 5: no program documentation; the program is marked when demoed and counts for 8%.

Dates and Deadlines

Assignment 1 (online submission):	Jan 25, 11:55pm
Assignment 2 (online submission):	Feb 08, 11:55pm
Last possible day for first demo (assignments 1 and 2):	Feb 23
Midterm examination:	Feb 28
Last day to drop:	Mar 9
Assignment 3 (online submission):	Mar 15, 11:55pm
Assignment 4 (online submission):	Mar 29, 11:55pm
Last possible day for second demo (assignments 3, 4, 5):	Apr 13
Final examination:	Apr 17, 7:00pm-9:00pm

Late Submissions

A mark of zero will be recorded in the case of a late submission. Only in exceptional circumstances will requests for extensions be entertained. Any such request must be presented to the instructor as soon as possible, with all supporting documentation.

Note that an issue you may have with technology is no excuse for late work. Computers crash, transfers time out, flash drives become corrupt, etc. These are not considered emergencies. They are part of the normal process of work. Protect yourself by managing your time and backing up your work.

Missed Midterm Examination

In the case of a missed midterm examination, no make-up test will be provided, and a mark of zero will be recorded. Only in exceptional circumstances will excuses for missed test be entertained. The sole remedy available for missed test is redistribution of its weight to the final exam. A request must be presented to the instructor as soon as possible, with all supporting documentation.

Regrading Policy

Any request for remarking must be submitted within seven days after the marks have been released. You are therefore encouraged to make sure your work has been correctly marked and your mark correctly recorded. A request regarding a hard copy submission must be submitted to the instructor using the appropriate remarking form with the complete original marked assignment or test. A request regarding an electronic submission must be submitted by email to the TA responsible for the assignments. Note that a remark may result in changes to marks assigned to other questions, and may lower your total mark.

Academic Integrity

You are expected to work on each problem on your own and present your own solution. You may use textbooks, lecture notes, lab notes, instructors, TAs, tutors and classmates to help you find general strategies to solve the problems, but you may not go out and find complete solutions to the problems. You may discuss the strategies to solve these problems with your fellow students, but you may not discuss complete solutions.

Do NOT take written notes away from a discussion with another student, do NOT use in any way somebody else's written solutions, do NOT lend your homework, do NOT allow others to access your computer account, do NOT give out your files, or you may face stiff academic penalties. Note that all submitted code may be checked for plagiarism using automated tools like MOSS (Measure Of Software Similarity) and the TA has been told to be alert for instances of fraud. If you are unsure whether an activity may constitute plagiarism or undue collaboration, consult the instructor immediately. You are encouraged to review the University's policy on academic integrity (https://www.uoguelph.ca/registrar/calendars/undergraduate/current/c08/c08-amisconduct.shtml).

Standard Statements

E-Mail Communication

All students are required to check their <uoguelph.ca> email account regularly. Use your <uoguelph.ca> account (not any other account) to contact the instructor or the TA. Start the subject of your message with the number 4800.

When You Cannot Meet a Course Requirement

When you find yourself unable to meet an in-course requirement because of illness or compassionate reasons, please advise the course instructor (or designated person, such as a teaching assistant) in writing, with your name, id#, and e-mail contact. See the Undergraduate Calendar (https://www.uoguelph.ca/registrar/calendars/undergraduate/current/c08/c08-drop.shtml) for information on regulations and procedures for Academic Consideration.

Drop Date

Courses that are one semester long must be dropped by the end of the fortieth class day; two-semester courses must be dropped by the last day of the add period in the second semester. The regulations and procedures for dropping courses are available in the Undergraduate Calendar (https://www.uoguelph.ca/registrar/calendars/undergraduate/current/c08/c08-drop.shtml).

Copies of Out-of-Class Assignments

Keep paper and/or other reliable back-up copies of all out-of-class assignments: you may be asked to resubmit work at any time.

Accessibility

The University promotes the full participation of students who experience disabilities in their academic programs. To that end, the provision of academic accommodation is a shared responsibility between the University and the student. When accommodations are needed, the student is required to first register with Student Accessibility Services (SAS). Documentation to substantiate the existence of a disability is required, however, interim accommodations may be possible while that process is underway. Accommodations are available for both permanent and temporary disabilities. It should be noted that common illnesses such as a cold or the flu do not constitute a disability. Use of the SAS Exam Centre requires students to book their exams at least 7 days in advance, and not later than the 40th Class Day. More information: www.uoguelph.ca/sas

Recording of Materials

Presentations which are made in relation to course work—including lectures—cannot be audio- or video-recorded without the permission of the presenter, whether the instructor, the TA, a classmate or guest lecturer.

Resources

The Academic Calendars (https://www.uoguelph.ca/registrar/calendars/) are the source of information about the University of Guelph's procedures, policies and regulations which apply to undergraduate, graduate and diploma programs.