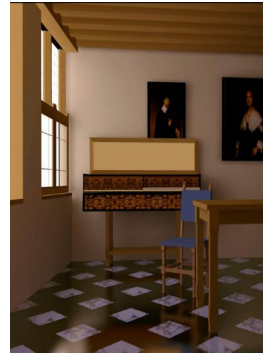


71-430-1

Computer Graphics

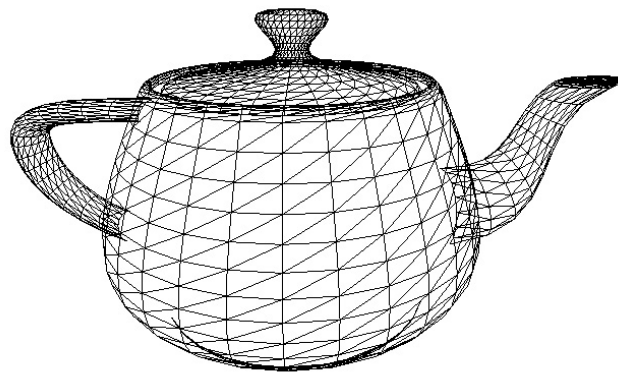
Fall 2015
MWF 9:00-9:50am
Classroom: AS-101A



Instructor: Dr. Dana Dominiak
Email: dominida@lewisu.edu
ddominiak@webfootgames.com

Office: AS-130L
Office Phone: 815-836-5819

Office hours: MWF 12 – 1 p.m.
and by appointment



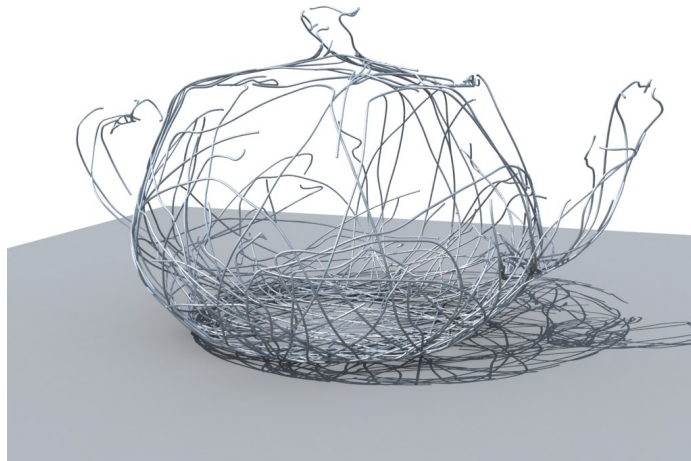
COURSE

- Credit hours: 3
- Catalog description:
This course provides an overview of display devices and applications, point-plotting techniques, two-dimensional transformations, clipping and windowing, lighting, and three-dimensional techniques. Students are also introduced to interactive computer graphics, animation and graphics applications. Students explore these concepts using C++ and the OpenGL programming interface.
- Prerequisites: 70-210 Programming and Data Structures

Lewis University is a Catholic University in the Lasallian Tradition. Our Mission is integrated into all aspects of University life, including this course. This course embraces the Mission of the University by fostering an environment in which each student is respected as an individual within a community of learners. In the spirit of the vision of Lewis University, the goals and objectives of this course seek to prepare students to be successful, life-long learners who are intellectually engaged, ethically grounded, socially responsible, and globally aware.

COURSE RATIONALE

- Real-time Simulations and Computer Graphics have grown into major industries which continue to grow. This course offers students experience in creating actual graphics simulation programs.



STUDENT LEARNING OUTCOMES

- Students will gain an understanding in the fundamentals of 2D and 3D graphics, including data representation, transformations and projection. The methods used in this course will be explained with an emphasis on realistic image generation and interactive video games. Student will learn how to translate algorithms described in pseudo code and numerical methods into working graphical programs.
- Student learning outcomes are evaluated through successful completion of *all* programming assignments, possibly up to 6 quizzes, a mid-term and a final exam.

RELATIONSHIP TO MISSION

- The demanding field of computer science requires that students gain significant experience, *knowledge* and *wisdom* in a variety of fields while working together in *association* in a productive team-oriented environment. I have *faith* that students will follow the letter and spirit of this class syllabus, which *justifies* the time I am spending preparing this course!

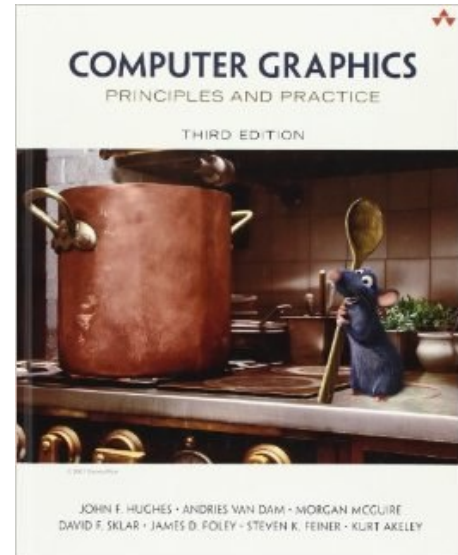


TEXTBOOK AND INSTRUCTIONAL MATERIAL

- Hughes, van Dam, et. al. Computer Graphics: Principles and Practice, 3/E. 2014, Addison-Wesley Professional. ISBN-10: 0321399528 • ISBN-13: 9780321399526
- Sébastien Loisel, Zed3D (See Blackboard for free download)
- **Blackboard**: students must login before each class to read latest updates and course announcements.

COURSE OUTLINE AND SCHEDULE

1. History of Computer Graphics
2. Review of Linear Algebra
3. Review of C++
4. Coordinate Systems
5. 2D Geometrical Transformations
6. Window/Viewport Mapping
7. 3D Geometrical Transformations
8. Scene Data Structures
9. Clipping
10. Projection
11. Arbitrary 3D Views
12. 3D Clipping
13. Hidden Line/Surface Removal (Time permitting)
14. Color (Time permitting)
15. Shading (Time permitting)



- The Final Exam will take place:
12/16/2015 Wednesday, 10:30 a.m. - 12:30 p.m.



COURSE REQUIREMENTS

- Class attendance.
- Successful completion of **all** programming assignments, on time.
- Passing grades on the Mid-term and Final Exam.
- Passing grades on all quizzes.
- Adequate class participation.
- **Original programming work. No copying source code from the internet or other students or anywhere else.**



GRADING POLICY

- Grades will be based upon successful completion of the course requirements using the point system and scale shown below.

MP1: Vector / Matrix Objects	50 points
MP2: Vector / Matrix Math	50 points
MP3: Load Vector Data	50 points
MP4: Display Vectors	50 points
MP5: Transformations	50 points
MP6: Clipping & Final Program	100 points
Midterm:	150 points
Final Exam:	200 points
Total:	700 points*

- The following approximate scale is used:
 - A 90% and above
 - B 80 – 89%
 - C 70 – 79%
 - D 60 – 69%
 - F below 60%



**Depending on the class performance, one to six quizzes worth 50 points each may be given.*

COURSE POLICIES AND PROCEDURES

- **Class attendance policy:** This course is primarily graded on in-class projects, therefore, attendance is required. It has been my experience that students who do not attend the lectures have an extremely difficult time with assignments and exams. Each student is responsible for obtaining all class materials or missed lecture notes. Each student is responsible for obtaining access to a computer and compiler. Machine problems and exams are based almost entirely from class lectures.
- **Academic honesty:** Scholastic integrity lies at the heart of Lewis University. Plagiarism, collusion and other forms of cheating or scholastic dishonesty are incompatible with the principles of the University. Students engaging in such activities are subject to loss of credit and expulsion from the University. (2013-2014 Undergraduate Catalog, p. 43).

▪ **Respect:**

Expressions of racism, sexism, misogyny, heterosexism, homophobia, trans-phobia, age-ism, able-ism, and religious discrimination (e.g. Islamophobia, anti-Semitism) violate the right that others have to be respected as fellow community members. This learning space is an extension of Lewis University's Sanctified Zone, a place where people are committed to working to end racism, bias and prejudice by valuing diversity in a safe and nurturing environment. This active promotion of diversity and the opposition to all forms of prejudice and bias are a powerful and healing expression of the desire to be Signum Fidei, "Signs of Faith," in accordance with the Lewis Mission Statement. To learn more about the Sanctified Zone, please visit: www.lewisu.edu/sanctifiedzone.



- **Policies regarding make-up examinations and late submission of assignments:**
Contact the instructor for scheduling make-up exams. **Late assignments will be lowered by 1 letter grade for each day late.** Assignments more than 5 days late will receive a 0 for a grade.
- **Drop and withdrawal deadlines** (see semester *Course Schedule*)
- **Classroom behavior expectations** (consistent with "Classroom Decorum" statement from *Student Handbook* on page 15). Students are expected to remain respectful to the instructor and other students at all times.
- **Other policies:**
 - **No cell phone use** in the classroom. No texting or checking email on cell phones during class. Your cell phone should be off and stored in a backpack, purse, or pocket.
 - Students are expected to bring a notebook and take notes from instructor during class lecture.



ASSISTANCE

- Assistance: The instructor is available to help students having difficulty. It is the responsibility of the student to approach the instructor to ask for help.
- Assistance is also available through LARC (Leckrone Academic Resource Center) for students requiring special accommodations.
- Students requiring special accommodations must submit documentation to LARC staff prior to the start of class or within the first week of class.



SUPPLEMENTARY MATERIALS

- Recommended websites
 - <https://www.khanacademy.org/>
 - <http://en.wikipedia.org/wiki/Wikipedia>
 - <http://www.siggraph.org/>
 - <http://www.computer.org/web/computingnow/cga>
 - <http://www.scratchapixel.com/>
 - <https://learn.adafruit.com/>
 - <http://json.org/>
 - <http://www.stroustrup.com/C++.html>
 - <https://developer.nvidia.com/>
 - <https://www.opengl.org/>
 - <https://msdn.microsoft.com/en-us/library/ms754130%28v=vs.110%29.aspx>



*"Sometimes I consider myself a fisherman.
Computer programs and ideas are the hooks, rods and reels.
Computer pictures are the trophies and delicious meals."*

--Clifford A. Pickover



**PLEASE NOTE THAT THIS SYLLABUS IS SUBJECT TO REVISION
IF THE NEED ARISES**

**Students are expected to be familiar with the
*Lewis University Copyright and Intellectual
Property Guidelines*, posted electronically on the
Lewis University Website.
www.lewisu.edu/academics/library/index.htm**