Loyola Marymount University Spring 2020
CMSI 371 COMPUTER GRAPHICS 3 Semester Hours

Lecture Times: Tuesday/Thursday 09:40AM-11:10AM Location: SEAVER 200

Instructor: Alex Wong Email: alexw@cs.ucla.edu
Office Hours Location: Keck Lab Annex
Zoom: lmula.zoom.us/j/9305642680 Office Hours: Tuesday 11:15AM-12:15PM

Course Description:
Introduction to computer graphics. Topics include the parameterizing and forming of curves and surfaces, positioning a pinhole camera in 3-dimensional space, transforming objects in 3-dimensional space, projecting such objects onto a 2-dimensional device space with perspective, applying texturing with colors and shading, and building renderers using methods such as ray tracing.

Learning Outcomes:
Students will understand the theory of computer graphics from a geometric point of view using mathematical concepts from algebra, geometry, trigonometry, calculus and linear algebra. Student will be able to build practical graphics applications to tackle real world problems using C++ and OpenGL.

Instructional Methods:
This course will focus on the theory behind methods used in computer graphics supplemented by projects to reinforce such concepts. Course meetings will be in form of lecture-discussion. Lecture attendance is not mandatory, but is highly encouraged.

Prerequisites
Students are expected to be familiar with programming fundamentals with an understanding of basic programming principles (e.g. using control structures, writing functions) and data structures (e.g. arrays, lists, trees, maps). Students are expected to have an understanding of principles from algebra, geometry, trigonometry, calculus and linear algebra.

Textbooks (optional):
- Edward Angel. *Interactive Computer Graphics: A Top-Down Approach with OpenGL*. Fifth Edition. Addison Wesley, 2009.
- Donald Hearn and Pauline Baker. *Computer Graphics with OpenGL*. Fourth Edition. Pearson, 2010.
- Steve Marschner and Peter Shirley. Fundamentals of Computer Graphics. Fourth Edition. CRC Press, 2016.
- John F. Hughes, Andries van Dam, Morgan McGuire, David F. Sklar, James D. Foley, Steven K. Feiner, and Kurt Akeley. Computer Graphics: Principles and Practice. 3rd Edition. Addison-Wesley, 2013.

Grading: *40% Projects, 10% Quizzes, 20% Midterm Exam, 30% Final Exam*
- A+ to A- : [100%, 90%]
- B+ to B- : (90%, 75%]
- C+ to C- : (75%, 60%]
- D+ to D- : (60%, 50%]
- F : (50%, 0%]

Note: the percentage break down will guarantee at least letter grade within the specified range; final grades can be higher depending on the performance of the overall class.

Workload:
Students can expect to spend 3 hours in weekly lectures, approximately 1 to 2 hours of outside study per week, and approximately 8 to 10 hours per project.

Holidays:
We will be observing the following holidays and breaks on the following lecture dates:

Tuesday	March 10, 2020	Spring Break
Thursday	March 12, 2020	Spring Break
Tuesday	March 31, 2020	Ceasar Chavez Day
Thursday	April 9, 2020	Easter Holidays

Lectures	**Topic**
January 14	Vector Spaces Preliminaries
January 16	Affine Combinations
January 21	Chaikin and Bezier Curves
January 23	Chaikin and Bezier Curves
January 28	Linear Algebra Preliminaries
January 30	2D Transformations
February 04	Linear Algebra Preliminaries
February 06	3D Transformation
February 11	4D Projective Space
February 13	Pinhole Camera Model
February 18	Viewing Transform
February 20	Camera Transform
February 25	Clipping
February 27	Clipping
March 03	Midterm Examination Review
March 05	Midterm Examination
March 17	Depth Buffers
March 19	Hierarchical Compositional Models
March 24	Colors and Illumination
March 26	Colors and Illumination
April 02	Shading and Texturing
April 07	Shading and Texturing
April 14	Shadows
April 16	Scan Conversion (Rasterization)
April 21	Scan Conversion (Rasterization)
April 23	Visible Surface Algorithms
April 28	Visible Surface Algorithms
April 30	Ray Tracing
May 7, 8:00 AM	Final Examination

****NOTE: the syllabus is tentative and subject to change.***

Academic Honesty. Academic dishonesty will be treated as an extremely serious matter with severe consequences that can range from receiving no credit for assignments/tests, failing the class, to expulsion. It is never permissible to turn in any work that has not been authored by the student, such as work that has been copied from another student or copied from a source (including Internet) without properly acknowledging the source. It is your responsibility to make sure that your work meets the standard of academic honesty set forth in the "LMU Honor Code and Process" which appears in the LMU Bulletin.

Special Accommodations. Students with special needs who require reasonable modifications, special assistance, or accommodations in this course should promptly direct their request to the Disability Support Services (DSS) Office. Any student who currently has a documented disability (ADHD, Autism Spectrum Disorder, Learning, Physical, or Psychiatric) needing academic accommodations should contact the DSS Office (Daum Hall 2nd floor, 310-338-4216) as early in the semester as possible. All discussions will remain confidential. Please visit LMU DSS for additional information.

Tentative Nature of the Syllabus. If necessary, this syllabus and its contents are subject to revision; students are responsible for any changes or modifications announced or distributed in class or posted on LMU's course management system MYLMUConnect.

Reporting Requirements of Sexual or Interpersonal Misconduct. As responsible employees, faculty are required to report any case of suspected sexual or interpersonal misconduct and cannot protect student confidentiality. For information about confidential counseling on campus and for general information about consensual relationships, sexual harassment, and sexual assault, please visit LMU Cares.

Emergency Preparedness. To report an emergency or suspicious activity, phone the LMU Department of Public Safety (x222 or 310-338-2893) or at the nearest emergency call box. In the event of an evacuation, follow the evacuation signage throughout the building to the designated safe refuge area where you will receive further instruction from Public Safety or a Building Captain. For more safety information and preparedness tips, visit LMU DPS.