UNIVERSITY OF CALIFORNIA
UCMERCED

Syllabus for CSE170-01: Computer Graphics

Fall 2022
Instructor: Renato Farias

Designation:	CSE-170 Computer Graphics
Catalog Description:	Basic algorithms in computer graphics enabling students to understand and experience the process of implementing modern computer graphics applications. Topics covered: shader programming, rasterization, clipping, hidden surface removal, transformations, rendering pipeline, scene graphs, curves and surfaces, constructive solid geometry, boundary representation, spatial partition methods, texture mapping, color models, illumination, and shading.
Text Books and Other Required Materials:	Fundamentals of Computer Graphics 5th edition by Peter Shirley, Michael Ashikhmin, Steve Marschner CRC Press
Course Objectives/ Student Learning Outcomes:	This course introduces 1) the basic algorithms employed by 3D graphics programming interfaces such as OpenGL, which are now implemented in practically all graphics cards available in computer systems from high-performance machines to personal and mobile computers, and 2) the basic modeling techniques and mathematical models used in specialized software packages in CAD, geometric modeling, and 3D animation. The course focuses both on the theoretical and practical aspects of the covered topics. The goal is to provide students with solid foundations for addressing a wide variety of computational problems in computer graphics, and to provide a thorough knowledge of the most common algorithms and techniques in the area.
Program Learning Outcomes:	
Prerequisites by Topic:	Proficient level of programming in C and C++, and as well basic knowledge of data structures and algorithms. Prior knowledge of OpenGL is desired but not required.
Course Policies:	The course is organized in about 2h of lectures and one lab session per week. While the lectures introduce the covered topics, the students perform several programming assignments during the lab sessions in order to understand and practice the several algorithms and techniques discussed in class. Optional assignments are also provided and can be used as a mechanism for students to improve their final grade. The assignments are organized in a way to cover important topics and to provide the necessary programming skills for developing a final project.
Academic Dishonesty Statement:	a. Each student in this course is expected to abide by the University of California, Merced's Academic Honesty Policy. Any work submitted by a student in this course for academic credit will be the student's own work. b. You are encouraged to study together and to discuss information and concepts covered in lecture and the sections with other students. You can give "consulting"

	help to or receive "consulting" help from such students. However, this permissible cooperation should never involve one student having possession of a copy of all or part of work done by someone else, in the form of an e mail, an e mail attachment file, a diskette, or a hard copy. Should copying occur, both the student who copied work from another student and the student who gave material to be copied will both automatically receive a zero for the assignment. Penalty for violation of this Policy can also be extended to include failure of the course and University disciplinary action. c. During examinations, you must do your own work. Talking or discussion is not permitted during the examinations, nor may you compare papers, copy from others, or collaborate in any way. Any collaborative behavior during the examinations will result in failure of the exam and may lead to failure of the course and University disciplinary action.
Disability Statement:	Accommodations for Students with Disabilities: The University of California Merced is committed to ensuring equal academic opportunities and inclusion for students with disabilities based on the principles of independent living, accessible universal design, and diversity. I am available to discuss appropriate academic accommodations that may be required for student with disabilities. Requests for academic accommodations are to be made during the first three weeks of the semester, except for unusual circumstances. Students are encouraged to register with Disability Services Center to verify their eligibility for appropriate accommodations.
Topics:	Rasterization, clipping, hidden surface removal, transformations, rendering pipeline, scene graphs, interpolation, curves and surfaces, constructive solid geometry, boundary representation, spatial partition methods, texture mapping, color models, illumination and shading, and overview of selected advanced topics in computer graphics, animation and GPU shader programming.
Class/laboratory Schedule:	2h of lectures and one 3h lab session per week
Midterm/Final Exam Schedule:	
Course Calendar:	The planned course schedule will be posted on CatCourses.
Professional Component:	
Assessment/Grading Policy:	Tentative assessment plan: 40% Exams (midterm and final) 20% Projects 40% Programming Assignments

Coordinator:	Renato Farias
Contact Information:	Email: rfarias2@ucmerced.edu Office: SE2-278
	I will try to answer your emails within 48 hours. However, I may not be able to answer emails at certain times, such as late in the day or during weekends/holidays. Please plan accordingly.
Office Hours:	Office hours will be announced on CatCourses.