ITP 380 – Video Game Programming
Units: 4
Spring 2020 Sections:
T/Th 5-6:50PM – Sanjay Madhav (madhav@usc.edu)
T/Th 7-8:50PM – Clark Kromenaker (kromenak@usc.edu)

Location: OHE 540

Instructors: See above
Office: See Piazza
Office Hours: See Piazza
Contact Info: All general course/assignments questions should be asked on Piazza (every student will receive an invitation at the start of the semester).
Personal questions and questions from prospective students should be directed via email to the instructor(s).

Teaching Assistants: TBD
Office: TBD
Office Hours: TBD
Contact Info: Via Piazza.

Course Description

This course provides students with an in-depth introduction to technologies and techniques used in the game industry today. Students will learn to program and create several different games in C++, starting with 2D games and moving on to 3D. This course focuses on practical, hands-on information that's critical to learning to be a successful video game programmer.

Learning Objectives

At semester's end, students will have:
1. Gained an understanding of core game systems (incl. rendering, input, sound, and collision/physics)
2. Developed a strong understanding of essential mathematics for games
3. Written several functional games in C++ individually
4. Learned critical thinking skills required to continue further study in the field

Prerequisite(s): CSCI 104L *or* ITP 365

Course Structure

Most weeks, we have a lecture on Tuesday and a lab assignment assigned in class on Thursday. The first part of each lab assignment is due at the end of class on Thursdays, and the final submission is due the following Wednesday.

Exams

There are two midterms and a final exam. All exams are cumulative.

Textbook

Madhav, Sanjay. *Game Programming in C++*. Pearson. 2018. ISBN-10: 0134597206.

Students can read this book for free through the USC library website ([here](#)).
Alternatively, students can purchase a copy of the book from Amazon or the USC bookstore.

Course Notes

Lecture slides and assignments will all be posted on Blackboard. Course discussions will occur on Piazza. Assignments will be submitted through Bitbucket.

Hardware Requirements

Students should have access to a computer running either Windows or MacOS. Students who do not have a computer may check one out on a weekly basis from the ITP office in OHE 412. Linux may work, but is technically unsupported.

Grading

In-class labs are graded Credit (CR)/No Credit (NC).

Exams are graded on a points scale from 0 to 100.

Lab assignments are graded using a specification-based grading system. You can receive one of four grades: Exemplary (E), Meets Expectations (M), Needs Revisions (N), or Zero (Z). We will discuss what each of these grades constitutes in the first class meeting.

Your lab assignments will be graded by Course TAs. When you receive your lab assignment grade, you will also receive feedback on recommended changes. You will have 1-2 weeks from when you receive this initial grade to resubmit for regrades, with multiple resubmissions allowed. Please note that if your initial grade

on a lab is a Z, you cannot get higher than an R for your final grade on that lab (unless it is an exception as outlined in class).

Final letter grades are assigned using a combined criteria. Possible grades are A, A-, B+, B, B-, C+, C, C-, D, and F.

As an example, here is the criteria to receive an A in the course:
- Get Credit (CR) on at least 10/12 in-class labs
- Get a Meets Expectations (M) or higher on all 12 lab assignments
- Get an Exemplary (E) on at least 8/12 lab assignments
- Have an average exam grade of at least 85%

The full criteria for each letter grade will be posted on Blackboard.

Assignment Submission Policy
All assignments must be submitted on GitHub in order to be graded. Instructions will be provided in class and on Blackboard.

Grading Timeline
Students will receive grades on programming assignments within one week after the due date. Upon receiving their initial grade, students have up to two (2) weeks to resubmit for regrades however many times they want to.

Late Policy
There is no additional late policy, however, the resubmission policy means that effectively you can turn in assignments up to two weeks late.

Make-up Policy for Exams
To make up for a missed exam, the student must provide a satisfactory reason (as determined by the instructor) along with documentation. Make-up exams are only allowed under extraordinary circumstances.

Plagiarism and Individual Work Policy
In this class, programming assignments are expected to represent the individual effort of each student. All programming assignment submissions will be compared with current, previous, and future students' submissions using MOSS, which is a code plagiarism identification program. If your code significantly matches another student's submission, you will be referred to SJACS with a recommended penalty of an F in the course.

It is okay to discuss solutions to specific problems with other students, but it is not okay to look through another student's code. It does not matter if this code is online or from a student you know, it is cheating. Do not share your code with anyone else in this or a future section of the course, as allowing someone else to copy your code carries the same penalty as copying the code yourself.

Course Material Policy
Do not reproduce, distribute, or post any lecture material, assignments, assignment solutions, or exams publicly without written consent of the instructor. You may take notes and make copies of course materials for your own use. You may not post course materials on sites like CourseHero. Doing so is a copyright violation and in some cases may also be an academic integrity violation that will be dealt with accordingly.

Course Schedule

Date	Lecture Topics	Readings	Due Dates
1/14	Course Intro; Game Programming Basics	Ch. 1 (pp. 1-14; 23-31)	
1/16	Lab 1 – Pong		
1/21	Game Object Models; Vector Basics	Ch. 1 (pp. 14-23); Ch. 3 (skip dot/cross product)	
1/23	Lab 2 – Asteroids		**Lab 1: 1/22 @ 11:59PM**
1/28	More Vector Math; AABBs; Levels	Ch. 3	
1/30	Lab 3 – Blocks		**Lab 2: 1/29 @ 11:59PM**
2/4	Platforming & Basic Sounds		
2/6	Lab 4 – Mario		**Lab 3: 2/5 @ 11:59PM**
2/11	Graphics Basics & 2D Techniques	Ch. 2	
2/13	Lab 5 – Zelda		**Lab 4: 2/12 @ 11:59PM**
2/18	Midterm I Practice/Review		
2/20	**Midterm Exam I**		
2/25	Artificial Intelligence	Ch. 4 (pp. 91-116)	
2/27	Lab 6 – Pac-Man		**Lab 5: 2/26 @ 11:59PM**
3/3	3D Graphics and Transforms	Ch. 5 (pp. 148-161)	
3/5	Lab 7 – Space Tunnel		**Lab 6: 3/4 @ 11:59PM**
3/10	More 3D Graphics; Cameras	Ch. 9 (pp. 275-283)	
3/12	Lab 8 – Mario Kart		**Lab 7: 3/11 @ 11:59PM**
	Spring Break		
3/24	Topics for Lab 9/10	Ch. 10 (read sections corresponding to slides)	
3/26	Lab 9 – Parkour's Edge, Part 1		**Lab 8: 3/25 @ 11:59PM**
3/31	Midterm II Practice/Review		
4/2	**Midterm Exam II**		
4/7	Graphics Topics; Collisions	Ch. 10 (read sections corresponding to slides)	
4/9	Lab 10 – Parkour's Edge, Part 2		**Lab 9: 4/8 @ 11:59PM**
4/14	Miscellaneous Topics	Ch. 6 (pp. 183-190); Ch. 9 (pp. 292-295); Ch. 11	
4/16	Lab 11 – Parkour's Edge, Part 3		**Lab 10: 4/15 @ 11:59PM**
4/21	TBD		
4/23	Lab 12 – Parkour's Edge, Part 4		**Lab 11: 4/22 @ 11:59PM**
4/28	Tricks and Industry Advice		
4/30	Final Exam Review		**Lab 12: 5/1 @ 11:59PM**
FINAL	**Final Exam according to final exam schedule:** For the T/Th 5-6:50PM section: Thursday, May 7, 4:30-6:30PM For the T/Th 7-8:50PM section: Thursday, May 7, 7-9PM Per university policy, students *cannot* anticipate their final exam (meaning you cannot take it earlier than the scheduled date).		

Statement on Academic Conduct and Support Systems

Academic Conduct

Plagiarism – presenting someone else's ideas as your own, either verbatim or recast in your own words – is a serious academic offense with serious consequences. Please familiarize yourself with the discussion of plagiarism in *SCampus* in Part B, Section 11, "Behavior Violating University Standards" https://policy.usc.edu/scampus-part-b/. Other forms of academic dishonesty are equally unacceptable. See additional information in *SCampus* and university policies on scientific misconduct, http://policy.usc.edu/scientific-misconduct.

Support Systems

Student Counseling Services (SCS) - (213) 740-7711 – 24/7 on call
Free and confidential mental health treatment for students, including short-term psychotherapy, group counseling, stress fitness workshops, and crisis intervention. https://engemannshc.usc.edu/counseling/

National Suicide Prevention Lifeline - 1-800-273-8255
Provides free and confidential emotional support to people in suicidal crisis or emotional distress 24 hours a day, 7 days a week. http://www.suicidepreventionlifeline.org

Relationship and Sexual Violence Prevention Services (RSVP) - (213) 740-4900 - 24/7 on call
Free and confidential therapy services, workshops, and training for situations related to gender-based harm.
https://engemannshc.usc.edu/rsvp/

Sexual Assault Resource Center
For more information about how to get help or help a survivor, rights, reporting options, and additional resources, visit the website: http://sarc.usc.edu/

Office of Equity and Diversity (OED)/Title IX Compliance – (213) 740-5086
Works with faculty, staff, visitors, applicants, and students around issues of protected class.
https://equity.usc.edu/

Bias Assessment Response and Support
Incidents of bias, hate crimes and microaggressions need to be reported allowing for appropriate investigation and response. https://studentaffairs.usc.edu/bias-assessment-response-support/

The Office of Disability Services and Programs
Provides certification for students with disabilities and helps arrange relevant accommodations. http://dsp.usc.edu

Student Support and Advocacy – (213) 821-4710
Assists students and families in resolving complex issues adversely affecting their success as a student EX: personal, financial, and academic. https://studentaffairs.usc.edu/ssa/

Diversity at USC
Information on events, programs and training, the Diversity Task Force (including representatives for each school), chronology, participation, and various resources for students. https://diversity.usc.edu/

USC Emergency Information
Provides safety and other updates, including ways in which instruction will be continued if an officially declared emergency makes travel to campus infeasible, http://emergency.usc.edu

USC Department of Public Safety – 213-740-4321 (UPC) and 323-442-1000 (HSC) for 24-hour emergency assistance or to report a crime.
Provides overall safety to USC community. http://dps.usc.edu