Video Game Programming

ITP 380 (4 Units)

Fall 2018

Objective	This course provides students with an in-depth introduction to technologies and techniques used in the game industry today. 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 multiple functional games in C++ individually 4. Learned critical thinking skills required to continue further study in the field
Concepts	3D math for games. C++. 3D graphics. Collision detection. Introduction to A.I. Implementing gameplay. Getting a job in the game industry.
Prerequisites	CSCI 104 or ITP 365x
Instructor	Matt Whiting
Contact	Students in the course should post their questions on Piazza. *Email:* whitingm@usc.edu (Only for non-course questions or prospective students).
Office Hours	TBA in OHE 530E or by appointment
Time/Location	Monday and Wednesday, 12 – 1:50PM in OHE 540
Course Structure	Most weeks, we have a lecture on Monday and a lab assignment assigned in class on Wednesday. The first part of each lab assignment is due at the end of class on Wednesday, and the final submission is due the following Tuesday. There are two midterm exams and a final exam. All exams are cumulative.
Textbook	Madhav, Sanjay. *Game Programming in C++.* 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.
Grading	The course is graded with the following weights: Lab Assignments (12 x 5%)　　　　60% Midterm Exam I　　　　　　　　12.5% Midterm Exam II　　　　　　　　12.5% Final Exam　　　　　　　　　　15% TOTAL POSSIBLE　　　　　　　100%
Software	Students will be able to setup their own PC and/or Mac computers for use in the class. Students will write code in C++ using a simple game framework designed for this course. ITP also offers Open Lab use for all students enrolled in ITP classes. These open labs are held beginning the second week of classes through the last week of classes. Hours are listed at: http://itp.usc.edu/labs/.

Grading Scale	Letter grades will be assigned according to the following scale:
	93%+ A
	90-92% A-
	87-89% B+
	83-86% B
	80-82% B-
	77-79% C+
	73-76% C
	70-72% C-
	69 D+
	67-68 D
	66 D-
	65 and below F
	Half percentage points will be rounded up to the next whole percentage. So for instance, 89.5% is an A-, but 89.4% is a B+.
	There is no curving. Students will receive the grade they earn. Extra credit is generally not offered.
Policies	*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 proper documentation. Make-ups are only allowed under extraordinary circumstances.
	Late Lab Assignments: Lab assignments *are not accepted late* unless there is a satisfactory reason (as determined by the instructor) along with proper documentation.

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 Section 11, *Behavior Violating University Standards* https://scampus.usc.edu/1100-behavior-violating-university-standards-and-appropriate-sanctions/. 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/. Discrimination, sexual assault, and harassment are not tolerated by the university. You are encouraged to report any incidents to the *Office of Equity and Diversity* http://equity.usc.edu/ or to the *Department of Public Safety* http://capsnet.usc.edu/department/department-public-safety/online-forms/contact-us. This is important for the safety whole USC community. Another member of the university community – such as a friend, classmate, advisor, or faculty member – can help initiate the report, or can initiate the report on behalf of another person. *The Center for Women and Men* http://www.usc.edu/student-affairs/cwm/ provides 24/7 confidential support, and the sexual assault resource center webpage sarc.usc.edu describes reporting options and other resources. **Support Systems** A number of USC's schools provide support for students who need help with scholarly writing. Check with your advisor or program staff to find out more. Students whose primary language is not English should check with the *American Language Institute* http://dornsife.usc.edu/ali, which sponsors courses and workshops specifically for international graduate students. *The Office of Disability Services and Programs* http://sait.usc.edu/academicsupport/centerprograms/dsp/home_index.html provides certification for students with disabilities and helps arrange the relevant accommodations. If an officially declared emergency makes travel to campus infeasible, *USC Emergency Information* *http://emergency.usc.edu/* will provide safety and other updates, including ways in which instruction will be continued by means of blackboard, teleconferencing, and other technology.
A Further Note on Plagiarism	In this class, all homework 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 reported to SJACS with the 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 you copying the code yourself.

Course Outline

W	Date	Topic(s)	Reading/Labs
1	8/20	Course Intro; Game Programming Basics	Ch. 1 (pp. 1-14; 23-31)
	8/22	2D Graphics Basics; Game Object Models	Ch. 1 (pp. 14-23); Ch. 2 (pp. 33-42)
2	8/27	Lab 2 – Pong	**Lab 1 DUE 8/26 @ 11:59PM**
	8/29	Vector Math and Physics Basics	Ch. 3 (skip dot/cross product)
3	9/3	***No class due to Labor Day on 9/3***	
	9/5	Lab 3 – Asteroids	**Lab 2 DUE 9/4 @ 11:59PM**
4	9/10	More Vector Math; Level Representations	Ch. 3
	9/12	Lab 4 – Blocks	**Lab 3 DUE 9/11 @ 11:59PM**
5	9/17	Platforming Physics and Sound	Ch. 2 (pp. 42-53); Ch. 10 (pp. 311)
	9/19	Lab 5 – 2D Platformer	**Lab 4 DUE 9/18 @ 11:59PM**
6	9/24	Midterm Practice/Review	
	9/26	**Midterm Exam I**	
7	10/1	Side scrollers, 2D cameras, parallax	
	10/3	Lab 6 – Endless Runner	**Lab 5 DUE 10/2 @ 11:59PM**
8	10/8	Artificial Intelligence	Ch. 4 (pp. 91-116);
	10/10	Lab 7 – Tower Defense	**Lab 6 DUE 10/9 @ 11:59PM**
9	10/15	3D Graphics, OpenGL	Ch. 5 (pp. 148-161)
	10/17	Lab 8 – 3D Tank Battle	**Lab 7 DUE 10/16 @ 11:59PM**
10	10/22	More 3D Graphics, Cameras	Ch. 9 (pp. 275-283)
	10/24	Lab 9 – Parkour's Edge, Part 1	**Lab 8 DUE 10/23 @ 11:59PM**
11	10/29	Midterm Practice/Review	
	10/31	**Midterm Exam II**	
12	11/5	More Physics and Collisions	Ch. 10 (read sections corresponding to the slides)
	11/7	Lab 10 – Parkour's Edge, Part 2	**Lab 9 DUE 11/6 @ 11:59PM**
13	11/12	Miscellaneous Topics	Ch. 6 (pp. 183-190); Ch. 9 (pp. 292-295); Ch. 11
	11/14	Lab 11 – Parkour's Edge, Part 3	**Lab 10 DUE 11/13 @ 11:59PM**
14	11/19	Networked Multiplayer Games Basics	
	11/21	***Thanksgiving Holiday (no class)***	
15	11/26	Lab 12 – Parkour's Edge, Part 4	**Lab 11 DUE 11/25 @ 11:59PM**
	11/28	Tricks and Industry Advice	**Lab 12 DUE 11/29 @ 11:59PM**
		Final Exam according to final exam schedule For the M/W 12-1:50PM section: Friday, December 7th from 11:00AM-1:00PM	