



School of Engineering  
*Information  
Technology Program*

## **ITP 380 – Video Game Programming**

**Units: 4**

**Spring 2021 Sections:**

T/Th 5-6:50PM – Sanjay Madhav ([madhav@usc.edu](mailto:madhav@usc.edu))

T/Th 7-8:50PM – Clark Kromenaker ([kromenak@usc.edu](mailto:kromenak@usc.edu))

**Location:** Online (it is unlikely we will have any in-class meetings during the semester)

**Instructors:** See above

**Office:** See Piazza

**Office Hours:** See Piazza

**Contact Info:** Ask all general course/assignments questions 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. Students are required to submit part of each assignment by the end of day on Thursday, and the final submission is due the following Wednesday at the end of day.

## Exams

There is a midterm and a cumulative final exam.

## 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. Lectures will automatically be recorded and links will 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: A, B, C, or F. We will discuss what each of these grades constitutes in the first class meeting.

Your lab assignments will be graded by Course TAs. With the exception of the final assignment, all assignments will due at the end of day on a Wednesday, and you will receive your initial grade on Saturday (three days after the due date). When you receive your initial lab assignment grade, you will also receive

feedback on recommended changes. You may resubmit your lab for a regrade by the end of Tuesday (three days after receiving your grade). Upon regrade, you can increase your grade by at most one letter on the scale. Eg., an initial grade of F can potentially regrade it to a C, an initial grade of C can potentially regrade to a B, and an initial grade of B can potentially regrade to an A.

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 9/12 in-class labs
- Get a B or higher on all 12 lab assignments
- Get an A 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.

### **Late Policy**

We may make exceptions on the “at most one letter on a regrade” rule on a case by case basis, if you provide a documented and sufficient reason to the instructor. Beyond this, the regrade policy allows students to resubmit to improve their grade by one letter grade.

### **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

(Note that the labs we ultimately assign in may be different games than those listed below, but this should give you an idea of the type of work).

Date	Lecture Topics	Readings	Due Dates
1/19	Course Intro; Game Programming Basics	Ch. 1 (pp. 1-14; 23-31)	
1/21	Lab 1 – Pong		
1/26	Game Object Models; Vector Basics	Ch. 1 (pp. 14-23); Ch. 3 (skip dot/cross product)	<b>Lab 1: 1/27 @ 11:59PM</b>
1/28	Lab 2 – Asteroids		
2/2	More Vector Math; AABBs; Levels	Ch. 3	<b>Lab 2: 2/3 @ 11:59PM</b>
2/4	Lab 3 – Blocks		
2/9	Platforming & Basic Sounds		<b>Lab 3: 2/10 @ 11:59PM</b>
2/11	Lab 4 – Mario		
2/16	Graphics Basics & 2D Techniques	Ch. 2	<b>Lab 4: 2/17 @ 11:59PM</b>
2/18	Lab 5 – Zelda		
2/23	Artificial Intelligence	Ch. 4 (pp. 91-116)	<b>Lab 5: 2/24 @ 11:59PM</b>
2/25	Lab 6 – Pac-Man		
3/2	3D Graphics and Transforms	Ch. 5 (pp. 148-161)	<b>Lab 6: 3/3 @ 11:59PM</b>
3/4	Lab 7 – Space Tunnel		
3/9	Midterm Practice/Review		
3/11	<b>Midterm Exam – will be online, more info will be provided in class</b>		
3/16	More 3D Graphics; Cameras	Ch. 9 (pp. 275-283)	<b>Lab 7: 3/17 @ 11:59PM</b>
3/18	Lab 8 – Mario Kart		
3/23	<b>Wellness Day (No class)</b>		<b>Lab 8: 3/24 @ 11:59PM</b>
3/25	Mini-Lecture – Topics for Lab 9; Lab 9 – Parkour’s Edge, Part 1	Ch. 10 (read sections corresponding to slides)	
3/30	Topics for Lab 10; Collisions	Ch. 10 (read sections corresponding to slides)	<b>Lab 9: 3/31 @ 11:59PM</b>
4/1	Lab 10 – Parkour’s Edge, Part 2		
4/6	Miscellaneous Topics		<b>Lab 10: 4/7 @ 11:59PM</b>
4/8	Lab 11 – Parkour’s Edge, Part 3		
4/13	More Graphics Topics		<b>Lab 11: 4/14 @ 11:59PM</b>
4/15	Lab 12 – Parkour’s Edge, Part 4		
4/20	TBD/Guest Lecture		<b>Lab 12: 4/21 @ 11:59PM</b>
4/22	<b>Wellness Day (No class)</b>		
4/27	Getting Hired in the Game Industry	Ch. 6 (pp. 183-190); Ch. 9 (pp. 292-295); Ch. 11	
4/29	Final Exam Practice/Review		
<b>FINAL</b>	<b>Final Exam – will be online, more info will be provided in class</b>		

## 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>