



ITP 438 – Advanced Gameplay Programming

Units: 4

Location: M/W 2-3:50PM in OHE 540

Instructor: Sanjay Madhav

Office Hours: Monday and Thursday 4:30-6:30PM in RRB 216

Contact Info: madhav@usc.edu

Teaching Assistants: Posted on Piazza

TA Office Hours: Posted on Piazza

Remote Attendance:

This course does not support remote attendance. Lectures will not be recorded or available on Zoom, and students are expected to attend the flipped classroom meetings in person.

Course Description

Advanced gameplay programming techniques for both single player and networked multiplayer games using an industry-standard game engine.

Learning Objectives

- Understand the fundamentals of how game systems function including the game framework, characters, collisions, behavior trees, animations, user interfaces, and networking
- Apply this understanding to implement and augment several engine systems
- Evaluate the quality and correctness of written code
- Create major new gameplay systems
- Create complex gameplay code in a commercial game engine

Prerequisite(s): ITP 380

Course Notes

This course is graded for a letter grade. The course website (<https://itp438-20223.github.io/>) contains all the content for the course including lecture slides, assignment instructions, links to flipped classrooms, etc). Outside of class, course discussion will take place on Piazza and Discord.

Twelve class meetings are “flipped classroom” meetings where students are expected to watch assigned videos prior to class. Under the guidance of the instructor, students will complete work during these meetings and must submit a Gradescope quiz each week to receive credit for the flipped classroom.

Exams

There is a midterm and a cumulative final exam.

Hardware/Software Required

Each student will be provided a personal Virtual Machine to use during the course of the semester. Instructions on how to access and configure these VMs will be given in the class. Alternatively, students with sufficiently powerful computers can use their own machine instead of the VM. All software used in the class is free to download and use.

Description of Assignments

Most flipped classroom activities will involve some amount of coding work which, depending on the activity, may involve working under the direction of the instructor, working individually, or working in small groups. This is to reinforce and expand on concepts from the lecture and required reading for that week.

The programming assignments will be individual assignments that expand on the materials covered in class meetings, and students should expect to spend 8-10 hours/week working on the assignments and flipped classroom materials.

Grading and Assessment of Assignments

Flipped classroom work will be graded Credit (CR)/No Credit (NC) based on whether the required activity items were completed in a satisfactory manner.

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

Programming assignments are graded using specifications grading¹ which lists specific requirements for each assignment. Students then receive an initial grade based on their adherence to the specifications:

- A – All specifications are met, there are no significant errors or bugs, and the code quality meets or exceeds code review expectations
- B – All specifications are met but there are bugs and/or code quality issues to address
- C – Not all specifications are met, but at least 50% of them are
- F – Less than 50% of the specifications are met

Students will receive their initial grade for each assignment with a list of requirements that should be satisfied in order to improve their grade. Students will have up to four days to make a regrade submission, upon which their assignment will be regraded. The grade can improve up to one letter grade (eg. B can improve to A, C can improve to B, and F can improve to C). The purpose of this grading system is to become comfortable with the standard software engineering industry practice of code reviews, as well as to allow room to learn from mistakes.

Final course grades are tabulated according to the table on the next page. For the “programming assignment” grades, the grade after any regrades is what counts towards the final grade criteria. Students must satisfy all criterion listed for a grade in order to receive that grade.

¹ Nilson, Linda B. *Specifications grading: Restoring rigor, motivating students, and saving faculty time*. Stylus Publishing, LLC, 2015.

Grade	Criteria
A	<ul style="list-style-type: none"> • Credit (CR) for at least 9/12 flipped classrooms • Get a B or higher on all 12 programming assignments • Get an A on at least 8/12 programming assignments • No Fs on any lab assignments • Average exam grade of at least 85%
A-	<ul style="list-style-type: none"> • Credit (CR) for at least 8/12 flipped classrooms • Get a B or higher on at least 11/12 programming assignments • Get an A on at least 6/12 programming assignments • No Fs on any lab assignments • Average exam grade of at least 80%
B+	<ul style="list-style-type: none"> • Credit (CR) for at least 8/12 flipped classrooms • Get a B or higher on at least 11/12 programming assignments • Get an A on at least 4/12 programming assignments • No Fs on any lab assignments • Average exam grade of at least 75%
B	<ul style="list-style-type: none"> • Credit (CR) for at least 7/12 flipped classrooms • Get a B or higher on at least 10/12 programming assignments • Get an A on at least 3/12 programming assignments • No Fs on any lab assignments • Average exam grade of at least 75%
B-	<ul style="list-style-type: none"> • Credit (CR) for at least 6/12 flipped classrooms • Get a B or higher on at least 9/12 programming assignments • No more than 1 grade of F on any programming assignments • Average exam grade of at least 70%
C+	<ul style="list-style-type: none"> • Credit (CR) for at least 6/12 flipped classrooms • Get a B or higher on at least 8/12 programming assignments • No more than 2 grades of F on any programming assignments • Average exam grade of at least 70%
C	<ul style="list-style-type: none"> • Credit (CR) for at least 5/12 flipped classrooms • Get a B or higher on at least 7/12 programming assignments • No more than 2 grades of F on any programming assignments • Average exam grade of at least 65%
C-	<ul style="list-style-type: none"> • Credit (CR) for at least 4/12 flipped classrooms • Get a B or higher on at least 6/12 programming assignments • No more than 3 grades of F on any programming assignments • Average exam grade of at least 60%
D+	<ul style="list-style-type: none"> • Credit (CR) for at least 3/12 flipped classrooms • Get a B or higher on at least 5/12 programming assignments • No more than 4 grades of F on any programming assignments • Average exam grade of at least 60%
D	<ul style="list-style-type: none"> • Credit (CR) for at least 3/12 flipped classrooms • Get a B or higher on at least 5/12 programming assignments • No more than 4 grades of F on any programming assignments • Average exam grade of at least 55%
D-	<ul style="list-style-type: none"> • Credit (CR) for at least 3/12 flipped classrooms • Get a B or higher on at least 5/12 programming assignments • No more than 4 grades of F on any programming assignments • Average exam grade of at least 50%
F	<ul style="list-style-type: none"> • Fail to meet criteria for a D-

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 for Assignments

Assignments are not accepted late unless you provide a documented and sufficient reason to the instructor to receive an extension. If an extension is granted, it usually will be for 3 days or less, as each week's assignment builds on the prior week's.

Beyond this, the regrade policy allows students to resubmit incomplete assignments to improve their assignment 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 assignment solutions or exams publicly without written consent of the instructor, as this will be considered an academic integrity violation. Except where otherwise noted, the lecture notes and assignment instructions for this course are © 2021 Sanjay Madhav, and are licensed under a Creative Commons Attribution-NonCommercial-ShareAlike 4.0 International [License](#).

Course Schedule

View the course schedule on the course website here: <https://itp438-20223.github.io/Schedule.html>

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” 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, policy.usc.edu/scientific-misconduct.

Support Systems:

Counseling and Mental Health - (213) 740-9355 – 24/7 on call
studenthealth.usc.edu/counseling

Free and confidential mental health treatment for students, including short-term psychotherapy, group counseling, stress fitness workshops, and crisis intervention.

National Suicide Prevention Lifeline - 1 (800) 273-8255 – 24/7 on call
suicidepreventionlifeline.org

Free and confidential emotional support to people in suicidal crisis or emotional distress 24 hours a day, 7 days a week.

Relationship and Sexual Violence Prevention Services (RSVP) - (213) 740-9355(WELL), press “0” after hours – 24/7 on call
studenthealth.usc.edu/sexual-assault

Free and confidential therapy services, workshops, and training for situations related to gender-based harm.

Office of Equity and Diversity (OED) - (213) 740-5086 | Title IX – (213) 821-8298
equity.usc.edu, titleix.usc.edu

Information about how to get help or help someone affected by harassment or discrimination, rights of protected classes, reporting options, and additional resources for students, faculty, staff, visitors, and applicants.

Reporting Incidents of Bias or Harassment - (213) 740-5086 or (213) 821-8298
usc-advocate.symlicity.com/care_report

Avenue to report incidents of bias, hate crimes, and microaggressions to the Office of Equity and Diversity | Title IX for appropriate investigation, supportive measures, and response.

The Office of Disability Services and Programs - (213) 740-0776
dsp.usc.edu

Support and accommodations for students with disabilities. Services include assistance in providing readers/notetakers/interpreters, special accommodations for test taking needs, assistance with architectural barriers, assistive technology, and support for individual needs.

USC Campus Support and Intervention - (213) 821-4710

campussupport.usc.edu

Assists students and families in resolving complex personal, financial, and academic issues adversely affecting their success as a student.

Diversity at USC - (213) 740-2101

diversity.usc.edu

Information on events, programs and training, the Provost's Diversity and Inclusion Council, Diversity Liaisons for each academic school, chronology, participation, and various resources for students.

USC Emergency - UPC: (213) 740-4321, HSC: (323) 442-1000 – 24/7 on call

dps.usc.edu, emergency.usc.edu

Emergency assistance and avenue to report a crime. Latest updates regarding safety, including ways in which instruction will be continued if an officially declared emergency makes travel to campus infeasible.

USC Department of Public Safety - UPC: (213) 740-6000, HSC: (323) 442-120 – 24/7 on call

dps.usc.edu

Non-emergency assistance or information.

Office of the Ombuds - (213) 821-9556 (UPC) / (323-442-0382 (HSC)

ombuds.usc.edu

A safe and confidential place to share your USC-related issues with a University Ombuds who will work with you to explore options or paths to manage your concern.