

San José State University
Department of Computer Science
CS 134, Programming and Designing Game Engines

Course and Contact Information

Instructor:	Jared Finder
Office Location:	Duncan Hall 282
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Email:	michael.finder@sjsu.edu
Office Hours:	5:45 – 6:30 Monday, Wednesday (right after class)
Class Days/Time:	4:30 – 5:45 Monday, Wednesday
Classroom:	MacQuarrie Hall 422

Faculty Web Page

Copies of the course materials such as the syllabus, major assignment handouts, etc. may be found on my personal web page at <http://hpalace.com/sjsu-2016spring>.

Course Description

In this class, we will make video games! This class covers architecting and programming a game engine for video games. It covers common common patterns and algorithms found in all games as well as specific popular game genres.

Learning Outcomes

Upon successful completion of this course, students will be able to:

1. SLO 1 Be able to identify what code in a game is performance critical.
2. SLO 2 Know common patterns in video game engines.
3. SLO 3 Create a game engine and implement a game in it with a team.

Required Texts/Readings

Textbook

There are no required books or reading. I will provide handouts at class or links to web pages when referencing material.

Other Readings

While not necessary, I recommend you get the book Game Engine Architecture by Jason Gregory. If you would like to save money, consider buying the 1st Edition for \$25 at Amazon instead of 2nd Edition.

These websites are always interesting and cover interesting game development news:

<http://gamasutra.com>

<http://gamedev.net>

<http://aigamedev.com>

Course Requirements and Assignments

SJSU classes are designed such that in order to be successful, it is expected that students will spend a minimum of forty-five hours for each unit of credit (normally three hours per unit per week), including preparing for class, participating in course activities, completing assignments, and so on. More details about student workload can be found in [University Policy S12-3](http://www.sjsu.edu/senate/docs/S12-3.pdf) at <http://www.sjsu.edu/senate/docs/S12-3.pdf>.

I expect to assign a small assignment about once every other week. Assignments will be given out on Wednesday and due the next Wednesday, with the first part of each Monday to cover any questions regarding the assignment. The class website will detail exactly what is expected for each assignment. In addition, there will be presentations given to the whole class. There will be no tests. Instead of tests, there will be projects.

NOTE that [University policy F69-24](http://www.sjsu.edu/senate/docs/F69-24.pdf) at <http://www.sjsu.edu/senate/docs/F69-24.pdf> states that “Students should attend all meetings of their classes, not only because they are responsible for material discussed therein, but because active participation is frequently essential to insure maximum benefit for all members of the class. Attendance per se shall not be used as a criterion for grading.”

Grading Policy

Grades will be based on the percentage of total points earned:

A+ = 98%-100%

A = 93% - 97%

A- = 90% - 92%

B+ = 88% - 89%

B = 83%-87%

B- = 80% - 82%

C+ = 78% - 79%

C = 73%-77%

C- = 70% - 72%

D+ = 68% - 69%

D = 60%-67%

D- = 50%-59%

F = 0% to 49%

Late Assignments

One point will be deducted for every day that homework is late. Presentations will not have a makeup time as they require class participation. If a student has a written medical excuse for missing a presentation, he or she can give the presentation to me during my office hours.

Note that “All students have the right, within a reasonable time, to know their academic scores, to review their grade-dependent work, and to be provided with explanations for the determination of their course grades.” See University Policy F13-1 at <http://www.sjsu.edu/senate/docs/F13-1.pdf> for more details.

Classroom Protocol

I hope that this class is one you look forward to throughout the week and will never be late to. Please do not show up late, as I will be starting promptly. Classes will be a mix of lecture, presentation, and group activities. Please make sure your cell phones are off or silent during the class.

University Policies

General Expectations, Rights and Responsibilities of the Student

As members of the academic community, students accept both the rights and responsibilities incumbent upon all members of the institution. Students are encouraged to familiarize themselves with SJSU’s policies and practices pertaining to the procedures to follow if and when questions or concerns about a class arises. See University Policy S90–5 at <http://www.sjsu.edu/senate/docs/S90-5.pdf>. More detailed information on a variety of related topics is available in the SJSU catalog, at <http://info.sjsu.edu/web-dbgen/narr/catalog/rec-12234.12506.html>. In general, it is recommended that students begin by seeking clarification or discussing concerns with their instructor. If such conversation is not possible, or if it does not serve to address the issue, it is recommended that the student contact the Department Chair as a next step.

Dropping and Adding

Students are responsible for understanding the policies and procedures about add/drop, grade forgiveness, etc. Refer to the current semester’s Catalog Policies section at <http://info.sjsu.edu/static/catalog/policies.html>. Add/drop deadlines can be found on the current academic year calendars document on the Academic Calendars webpage at http://www.sjsu.edu/provost/services/academic_calendars/. The Late Drop Policy is available at <http://www.sjsu.edu/aars/policies/latedrops/policy/>. Students should be aware of the current deadlines and penalties for dropping classes.

Information about the latest changes and news is available at the Advising Hub at <http://www.sjsu.edu/advising/>.

Consent for Recording of Class and Public Sharing of Instructor Material

[University Policy S12-7](http://www.sjsu.edu/senate/docs/S12-7.pdf), <http://www.sjsu.edu/senate/docs/S12-7.pdf>, requires students to obtain instructor's permission to record the course and the following items to be included in the syllabus:

- “Common courtesy and professional behavior dictate that you notify someone when you are recording him/her. You must obtain the instructor's permission to make audio or video recordings in this class. Such permission allows the recordings to be used for your private, study purposes only. The recordings are the intellectual property of the instructor; you have not been given any rights to reproduce or distribute the material.”
 - It is suggested that the greensheet include the instructor's process for granting permission, whether in writing or orally and whether for the whole semester or on a class by class basis.
 - In classes where active participation of students or guests may be on the recording, permission of those students or guests should be obtained as well.
- “Course material developed by the instructor is the intellectual property of the instructor and cannot be shared publicly without his/her approval. You may not publicly share or upload instructor generated material for this course such as exam questions, lecture notes, or homework solutions without instructor consent.”

Academic integrity

Your commitment, as a student, to learning is evidenced by your enrollment at San Jose State University. The [University Academic Integrity Policy S07-2](http://www.sjsu.edu/senate/docs/S07-2.pdf) at <http://www.sjsu.edu/senate/docs/S07-2.pdf> requires you to be honest in all your academic course work. Faculty members are required to report all infractions to the office of Student Conduct and Ethical Development. The [Student Conduct and Ethical Development website](http://www.sjsu.edu/studentconduct/) is available at <http://www.sjsu.edu/studentconduct/>.

Campus Policy in Compliance with the American Disabilities Act

If you need course adaptations or accommodations because of a disability, or if you need to make special arrangements in case the building must be evacuated, please make an appointment with me as soon as possible, or see me during office hours. [Presidential Directive 97-03](http://www.sjsu.edu/president/docs/directives/PD_1997-03.pdf) at http://www.sjsu.edu/president/docs/directives/PD_1997-03.pdf requires that students with disabilities requesting accommodations must register with the [Accessible Education Center](http://www.sjsu.edu/aec) (AEC) at <http://www.sjsu.edu/aec> to establish a record of their disability.

CS 134, Programming and Designing Game Engines, Fall 2016 Schedule

The following schedule is tentative and subject to change. The schedule will be kept up to date on the class website at <http://hpalace.com/sjsu-2016spring>.

Course Schedule

Week	Date	Topics, Readings, Assignments, Deadlines
1	Feb 1 st Feb 3 rd	Class Introduction & Fundamentals – The Game Loop, Parts of a Game Engine Game Engine Architecture Chapter 1 – Introduction, Chapter 7 – The Game Loop
2	Feb 8 th Feb 10 th	Fundamentals – Video game math, Points and vectors, External libraries Game Engine Architecture Chapter 4 – 3D Math for Games
3	Feb 15 th Feb 17 th	Drawing – Level representation, 2D, Top-down, Isometric, 3D Game Engine Architecture Chapter 10.2.8 – Rendering Pipeline (Application)
4	Feb 22 nd Feb 24 th	Drawing – Optimizations, animation, game cameras
5	Feb 29 th Mar 2 nd	Physics – Collision detection, Collision resolution Game Engine Architecture Chapter 12 – Collision and Rigid Body Dynamics
6	Mar 7 th Mar 9 th	Physics – Advanced physics, optimizations
7	Mar 14 th Mar 16 th	Game Developer's Conference – TBD
8	Mar 21 st Mar 23 rd	Physics – Genre Specific Physics
9	Mar 28th Mar 30th	SPRING BREAK
10	Apr 4 th Apr 6 th	AI – Decision making, FSMs, Behavior Trees Game Engine Architecture Chapter 14 – Introduction to Gameplay Systems
11	Apr 11 th Apr 13 th	AI – Pathfinding Text Drawing, Sound
12	Apr 18 th Apr 20 th	Review. Data driven architecture, Start of team project
13	Apr 25 th Apr 27 th	Multithreaded architectures
14	May 2 nd May 4 th	Flexible Subject 1
15	May 9 th May 11 th	Flexible Subject 2

Week	Date	Topics, Readings, Assignments, Deadlines
16	May 16 th	Flexible Subject 3
Final	May 19 th	Team Project is Due