

CPI394- Special Topics

Game Design Fundamentals

Instructors

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Course Objectives and Expected Learning Outcomes

- Develop the vocabulary and understanding to describe, analyze and develop components of games and gameplay
- Develop a game from idea to physical prototype
- Create common documentation such as pitch documents, design documents, rules documents, etc.
- Develop leadership and communication skills to be able to pitch, sell and develop their game
- Expand the overall vision and introduce other fields such as human computer interaction, behavioral science, etc.

Prerequisite

CPI111 – Game Development 1

Recommended Material

Theory of Fun for Game Design, Raph Koster

Game Design Workshop: A Playcentric Approach to Creating Innovative Games, Tracy Fullerton

Extra Credits - <https://www.youtube.com/extracredits>

Gamasutra - <http://www.gamasutra.com/>

Game Maker's Toolkit - <https://www.youtube.com/user/McBacon1337>

Course Description & Plan:

Course Description

Game Development relies on three primary pillars: Programming, Art and Design. It is up to the designers to facilitate communication between the other pillars and to maintain a vision for the overall product that is being developed. The designers are responsible for the communication between the game and the player. This requires the designers to acquire and apply different tools and techniques to invoke specific responses from a player.

The students will learn to analyze games that they have played and be exposed to games from the past that they might have overlooked. Students will learn to identify core game structures, feedback loops, risk-reward cycles and more. They will then be asked to apply that knowledge to the creation of physical games.

This course will put the student in a hands on approach to learning the process and techniques of game design. Students will apply lessons learned via lecture and experience to the creation of physical prototype games.

Catalog Description:

This course introduces game development from the design perspective. The course will develop the vocabulary of game analysis and design and apply those ideas towards making physical prototypes. This will be a hands-on, workshop style course.

Plan for the Course:

The goal will be to have student become well versed in the language and practice of game design. The course will be delivered via alternative learning techniques. There will be a lecture component, but the goal is to have the students work in a more hands on environment. There will be a general cycle of lecture followed by group work. Assignments will be focused on the creation and play of physical prototypes.

The idea of this class is to grow past a simple love for games. In a nutshell, the course seeks to “ruin” games for the student and unlock an analytical mindset to get beyond the surface of games. Game designers see games as systems and structures. This class will seek to equip the student with the necessary knowledge that they will be able to break down and process a game into these systems and structures and analyze them.

The course will also attempt to broaden the student’s mindset to maximize the experience and knowledge they have to draw on. The course will feature several asides to reach into topics and fields of study the student may have never considered such as architecture, anthropology, psychology, philosophy and more.

Outline of Major Topics (Subject to change):

- What is a Game Designer?
 - Becoming a better player
 - Biases, Tropes and Expectations
 - Designing for the player
 - Theories of Play and Fun
 - Timmy, Johnny, Spike
 - Blooms Taxonomy
 - Pulling it all together
 - Design Paradigms
 - Top-Down and Bottom-Up Design
 - Iterative Design
 - Structure of Games
 - Cognition and Game Design
 - Patterns, Grouping and Matrixing
 - Conveyance
 - Grok Cycle
 - Feedback Loops
 - Risk-Reward Cycles
 - Mechanics
 - Core Game Loop
 - Chance, Probability and Game Balance
 - Levels, Puzzles, etc.
 - Game Maker's Toolkit Level Design Theory
 - Megaman Challenge Progression
 - Puzzle Design
 - Genre Specific Design Topics
 - Adventure
 - Horror
 - Action
 - Story
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Course Materials & Grading Policies (Subject to Change)

Game Design Workshops – 50%

- one week designs
- multi-week designs
- review & post-mortem

Assignments - 25%

- Analysis essays
- Discussions/Journals

Final Project - 25%

- Board/Card/Prototype Game

Final Grade Percentage

A+ \geq 97%
A \geq 90% and $<$ 97%
B+ \geq 87% and $<$ 90%
B \geq 80% and $<$ 87%
C+ \geq 77 and $<$ 80%
C \geq 70% and $<$ 77%
D \geq 60% and $<$ 70%
E $<$ 60%

Assignments:

Game Design Workshops –

These are small team projects. Each workshop will give a set of ingredients that the teams can draw from to make a playable physical game prototype.

Each game will be played in class and students will render assessments and reviews of games they played.

Games will be judged for completeness and design principle use.

Written assignments –

One of the best ways to learn to make games is to analyze other games and design theory. The written assignments will have the students play, analyze and discuss different games or analyze games and players from a specific perspective.

Written assignments will be individual assignments.

Journaling –

There will be several Discussion board “Journal” style assignments that will occur on a regular basis. These will largely be graded for completion and effort.

Example: “This week I learned”, “Games Everyone Should Play”, etc.

Final Project –

The class will culminate in a several week final project. This will essentially be a more open longer term workshop with the ultimate goal of creating a fully realized physical gameplay experience.

Games will be played during finals.

Late Policy

The following rubric demonstrates my late policy for unexcused late assignments:

- Assignment turned on the due date - Eligible for 100% of points (24 hour grace period)
- Assignments turned in up to one week late will lose 10% of their final score
- Assignments turned in up two weeks late will lose 20% of their final score
- Assignment turned in late after two weeks late will lose 50% of their final score

This policy does not extend past the final day of the session or any other fixed point.

Assignments that are not submitted at the due date will receive a 0 grade which will stand until other arrangements are made. If you are submitting a late assignment, you are required to communicate that to me or your assignment may not be graded.

After multiple weeks I may choose to not accept your late work.

My policy is fairly forgiving ... If you are found abusing this policy; I may choose not to accept your late work

Important Note: I reserve the right to change this grading system as the course progresses and various circumstances develop.

Peer Evaluations: If the instructor deems it necessary – team peer evaluations will occur during the final weeks of the course. *These peer evaluations will directly impact individual student scores across all appropriate milestones, including a reduction to 0.*

Absence & Make-Up Policies

Assignments:

Assignments are handled according to the above Late-work Policy. If the circumstances for missing the assignment are extraordinary somehow, please communicate with the instructor about possible exceptions to this rule.

Reminder: The normal grading period for an assignment is about 1~3 days after the grace-period date. If you turn the assignment in more than 2~3 days late, you should come to the instructor's office hours to have it graded.

Final Project Milestones:

Whenever possible the student teams should notify the instructor before the milestone if an alternative date for the milestone is required. In cases of emergencies the student should immediately email the instructor the circumstances of the absence. The student should follow up on this as soon as possible during class time or office hours. An alternative date/time can be negotiated assuming the absence is excusable.

Final Word:

At a certain point in the semester the instructor will announce a final day for late work. This date will usually be about two weeks before the semester ends. Any late-work past that date will need to be negotiated directly with the instructor.

Religious Accommodations:

Accommodations will be made for religious observances provided that students notify the instructor at the beginning of the semester concerning those dates. Students who expect to miss class due to officially university-sanctioned activities should inform the instructor early in the semester. Alternative arrangements will generally be made for any examinations and other graded in-class work affected by such absences. The preceding policies are based on [ACD 304-04](#), "Accommodation for Religious Practices" and [ACD 304-02](#), "Missed Classes Due to University-Sanctioned Activities."

Disability Accommodations.

Suitable accommodations will be made for students having disabilities and students should notify the instructor as early as possible if they will require same. Such students must be registered with the Disability Resource Center and provide documentation to that effect.

Getting Help:

There are many help resources available for this course. You can get help from tutors during office hours each week. In addition, their schedule will be available later on the course web page. Tutors office hours and lab hours are subject to change. For the latest information on office and lab hours, please check the class web page frequently. If you bring questions regarding assignments, make sure you have the development of your solution thus far.

How to Study:

For general advice on how to study for any course, see Dr. William J. Rapaport's web page, "How to Study".

<http://www.cse.buffalo.edu/~rapaport/howtostudy.html>

Communications

Class Discord

I have a Game Certificate classes Discord server. This is a multi-class and partially social academic server for Game Certificate students taking my CPI111/CPI211 and other game courses. The class Discord is a great way to reach me as well as I usually have it running on my work computers and home computers.

A link to the Discord will be provided in the course announcements.

Email

To get in contact with me through email – Justin.selgrad@asu.edu -- you may also use the Email item in the shell. When sending me emails please include the course code in subject line – this helps differentiate class emails from administrative. Also, if you have a question or need help please put the word question or help in the subject line.

Announcements

Please keep track of the course announcements. They are a major way for me to let you know what's going on. This might range from uploading sample code to adjustments to quizzes, tests or assignments. I will usually echo the announcement on the course Discord as well.

On the subject of "bugging" me.

If you do not hear back from me about your email, feel free to resend the email. I have a lot of students and there is a good chance I did not see your email. If you are continually missed, see me in person about your issue. There will be times where you need me to do something for you and I might tell you "email me every day until I tell you to stop". If I tell you this, I mean it! Please follow through.

It takes a lot to annoy me!

Tips for Success:

- Practice, Practice and Practice some more!
 - One does not learn how to program computers by reading a book alone; Practice is essential.
- Whenever possible, look ahead!
 - Students who are most successful research and read ahead of time to first introduce terms and concepts,
- Attend class and be active!
 - Attend every class and participate actively (taking notes and asking questions), review the material in the text again to make sure it is clear, read and begin assignments shortly after they are posted so they may ask questions well ahead of the deadline,
- Use Office Hours
 - Seriously, I'm here to help
- **START EARLY AND OFTEN**
 - DO NOT wait when it comes to projects, especially the final project.
 - *Making games is hard!* Start as soon as you can and don't be afraid of tearing this apart and starting over.

Attendance:

You should attend lecture to enhance your learning experience. Whenever possible we will have in class exercises and group discussion.

On occasion I may also have short in-class quizzes or exercises that will be counted in the assignments portion of the final grade.

Peer Study

I openly encourage you to work next to each other on programming assignments. This does not mean multiple people working on the same code-base. This means that you should seek out help and understanding from your peers and work to solve problems together – but – you should code your own solution to the problem.

Turning in shared code is against policy and can be considered plagiarism.

Leave the past in the past

Work on programming assignments from scratch. Never turn in old versions or past assignments (especially without permission).

When all else fails ...

Do something stupid ...

- Sometimes when working on a bug that you can't figure out it's a good idea to try to make the code do something EXPECTEDLY wrong for the sake of finding out what's actually wrong

Output everything ...

- Put output statements at the beginning and end of every function call and logic block to figure out exactly where things are going wrong
- Output values to see where they go bad

START OVER

- The hardest pill to swallow after working "SO LONG" on an assignment ...
- Sometimes the best thing is to start over and try again. You'll be back to where you were in "no time" and you probably coded it better the second or even third time

Academic and University Policies:

Academic Integrity:

All course content and materials, including lectures (Zoom recorded lectures included), are copyrighted materials and students may not share outside the class, upload to online websites not approved by the instructor, sell, or distribute course content or notes taken during the conduct of the course (see [ACD 304–06](#), “Commercial Note Taking Services” and ABOR Policy [5-308 F.14](#) for more information).

You must refrain from uploading to any course shell, discussion board, or website used by the course instructor or other course forum, material that is not the student's original work, unless the students first comply with all applicable copyright laws; faculty members reserve the right to delete materials on the grounds of suspected copyright infringement.

There are a number of actions that constitute a violation of the policy. These actions include, but are not limited to:

- Practicing any form of academic deceit;
- Referring to materials or sources or employing devices (e.g., audio recorders, crib sheets, calculators, solution manuals, or commercial research services) not specifically authorized by the instructor for use during tests, quizzes, homework, and class activities;
- Acting as a substitute for another person in any academic evaluation or using a substitute in any academic evaluation;
- Possessing, buying, selling, or otherwise obtaining or using, without appropriate authorization, a copy of any materials intended to be used for academic evaluation in advance of its administration;
- Depending on the aid of others to the extent that the work is not representative of the student’s abilities, knowing or having good reason to believe that this aid is not authorized by the instructor;
- Providing inappropriate aid to another person, knowing or having good reason to believe the aid is not authorized by the instructor;
- Submitting the ideas or work of another person or persons without customary and proper acknowledgment of sources (i.e., engaging in plagiarism); permitting one's own ideas or work to be submitted by another person without the instructor’s authorization; or
- Attempting to influence or change any academic evaluation or record for reasons having no relevance to class achievement.

University policy allows for cheating sanctions ranging from zero credit for an assignment to expulsion (without expectation of readmission) from the university. **Any student who is found to have violated the university's academic integrity policy in this course, no matter how minor the violation, will at a minimum receive an e in the course.**

ASU Policies, Professional and Ethical Behavior:

Students are expected to treat others fairly, with respect and courtesy, regardless of such factors as race, religion, sexual orientation, gender, disability, age, or national origin. In this class, you are expected to contribute to the overall campus climate such that others feel welcome, are respected, and are able to develop to their full potential. This will allow each person to contribute to the success of the class as a whole. ASU and the College of Engineering are committed to maintaining a productive, enjoyable and diverse campus environment.

Engineers are expected to effectively communicate ideas. Inappropriate language (written and oral) does not effectively communicate your ideas to an audience. Inappropriate language includes not only profanity, but also words that are demeaning to a person or group (racially, sexually, ethnically, etc.). You are expected to participate in the various classroom activities, including:

- Coming to each class on time and staying until dismissed;
- Following instructions given by the instructor, including actively working on whatever assignment has been given;
- Not consuming any food or drink while in the ASU classrooms, and not bringing any open containers of food or drink into the classrooms; and
- Avoiding disruptive side conversations. You are expected to make appropriate use of ASU facilities and property, including:
 - Leaving a clean work space – tables, floors and chairs; all trash picked up and disposed of; treating walls, furniture and floors properly – putting feet on tables and chairs, etc., not writing upon or disfiguring furniture; and
 - Leaving computers as you would furniture – clean and ready to use, without any remaining software, links, screen savers or settings that will offend or impede the efforts of subsequent users.

These are consistent with university-wide behavioral expectations described in the various codes of conduct and policies administered through ASU Office of Student Life - Student Judicial Affairs:

(<http://www.asu.edu/studentlife/judicial/index.html>)

Adapted from Prof. Burrow's document

Classroom Behavior

Cell phones and pagers (must be/or state alternative rule) turned off during class to avoid causing distractions. The use of recording devices is not permitted during class. Any violent or threatening conduct by an ASU student in this class will be reported to the ASU Police Department and the Office of the Dean of Students

University Mask Policy:

Until further notified, per ASU policy, faculty, staff, students and visitors, are required to wear face coverings in classrooms, labs, offices and community spaces.

Withdrawal & Incomplete Policies:

All university and college policies concerning withdrawal deadlines, incomplete, audits, and other procedures are in effect for this course. All students are advised to be aware of and to carefully follow these guidelines.

Incompletes require circumstances outside of the student's control (such as documented health problems, family emergencies, etc.) and good standing in the class to be granted. Evidence of the circumstances should be made available upon request. Please do not come to me at the end of the course and want an "Incomplete" simply because you have fallen behind. **An Incomplete will not be given** without valid circumstances.

Policy against threatening behavior, per the Student Services Manual, [SSM 104-02](#)

Students, faculty, staff, and other individuals do not have an unqualified right of access to university grounds, property, or services. Interfering with the peaceful conduct of university-related business or activities or remaining on campus grounds after a request to leave may be considered a crime. All incidents and allegations of violent or threatening conduct by an ASU student (whether on- or off-campus) must be reported to the ASU Police Department (ASU PD) and the Office of the Dean of Students.

Harassment and Sexual Discrimination

Arizona State University is committed to providing an environment free of discrimination, harassment, or retaliation for the entire university community, including all students, faculty members, staff employees, and guests. ASU expressly prohibits discrimination, harassment, and retaliation by employees, students, contractors, or agents of the university based on any protected status: race, color, religion, sex, national origin, age, disability, veteran status, sexual orientation, gender identity, and genetic information.

Title IX is a federal law that provides that no person be excluded on the basis of sex from participation in, be denied benefits of, or be subjected to discrimination under any education program or activity. Both Title IX and university policy make clear that sexual violence and harassment based on sex is prohibited. An individual who believes they have been subjected to sexual violence or harassed on the basis of sex can seek support, including counseling and academic support, from the university. If you or someone you know has been harassed on the basis of sex or sexually assaulted, you can find information and resources at <https://sexualviolenceprevention.asu.edu/faqs>.

Mandated sexual harassment reporter

As a mandated reporter, I am obligated to report any information I become aware of regarding alleged acts of sexual discrimination, including sexual violence and dating violence. ASU Counseling Services, <https://eoss.asu.edu/counseling>, is available if you wish discuss any concerns confidentially and privately.

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Instructor Policies

Teaching Philosophy

I keep my classes laid back and encourage the interaction of the entire group. One of the most powerful aspects of the classroom environment is looking at a topic from different points of view. If you have a point of view that is different from mine I openly encourage you to raise it during the discussion. The examination of a topic from all points of view will help everyone reach a greater understanding of the topic.

It is my philosophy that every person is responsible for their own education. What you get out of a class is directly proportional to what you put into it. I will do everything in my power to help you with your education but the ultimate responsibility is yours.

You are responsible for information covered in class as well as out of the book. The power of the classroom experience is to pull from multiple sources to enhance your understanding of the subject; this includes me, the book, other students and any other resource that is available.

Participation

Participation is very important. Keep up to date with labs, assignments, announcements and course materials. If there are team projects, participation in that team will be part of the grade. If teammates inform me that a student never shows up for team work sessions, or does not participate in the project, that will be a factor. In the end, poor performance in the class is usually a direct result of poor participation and/or not putting in a good effort.

Plagiarism

Plagiarism will be met with harsh consequences. I will report any incident to student services and punishment will be meted out according to school policy.

Chegg is Plagiarism

This should go without saying, but if you upload your assignment, test, quiz, etc. to Chegg and/or use code from Chegg (or any other similar website), that will be considered plagiarism.

Stack-Exchange / Stack-Overflow / Etc. used incorrectly are Plagiarism

There is a meme out there amongst students that your career will be nothing more than Googling how to write code on the job. This is utterly false. Do not make the mistake of somehow thinking that copying code from an online resource like Stack-Exchange is an “industry standard.” It is as much plagiarism as anything else to wholesale copy code.

Depending on what you copy and from where, you can open your employer up to possible consequences.

Tutorials used incorrectly are Plagiarism

When you use a tutorial you should follow this pattern:

1. Follow the tutorial, type it letter for letter if you have to
2. “tear that version up” and start over
3. Follow the tutorial again, trying to reference it as little as possible
4. Tear that version up and start over
5. Repeat step 3 & 4 until you can code the ideas in the tutorial from your own head and knowledge
6. Code the solution from your own head and knowledge
7. Only after reaching step 6 should you consider turning that code in

Syllabus Disclaimer

The syllabus is a statement of intent and serves as an implicit agreement between the instructor and the student. Every effort will be made to avoid changing the course, but the possibility exists that unforeseen events will make syllabus changes necessary. Remember to check your ASU email and the course site often.

Copyright

All course content and materials, including lectures (Zoom recorded lectures included), are copyrighted materials and students may not share outside the class, upload to online websites not approved by the instructor, sell, or distribute course content or notes taken during the conduct of the course (see ACD 304–06, “Commercial Note Taking Services” and ABOR Policy 5-308 F.14 for more information).

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SYLLABUS CHANGES: ANY INFORMATION IN THIS SYLLABUS MAY BE SUBJECT TO CHANGE.