

GAM 397: Game Design Mechanics

Spring 2019

Mon/Wed, 11:50 AM—1:20 PM

Daley Building, Rm 503

Peter McDonald

Email: peter.mcdonald@depaul.edu

Office: Daley Building, Rm 205a

Office Hours: Mon/Wed, 1:30-3:00

Course Description

A thousand composite skills go into making a game, but a game is also a complex system where each element needs to connect with and elevate the whole. In this course we will be taking a deep dive into the genre of 2D platforming games in order to examine how each decision you make as a designer causes rippling impacts across the system. Beginning with the simplest mechanics, running and jumping, we will see how the dozens of variables shape the nature of flow in level design. We will look at how spatial layout builds a world, tells a story, and scripts encounters with enemies. Platformers provide a wide design space in which to introduce other mechanics, and students will have a chance to invent strange additions and discuss how the procedural rhetoric of jumping changes a player's experience. In order to gain familiarity and speak conversantly about the genre, students will play a representative selection of platforming games and discuss the impact of specific design decisions within them. Students are expected to produce a platforming game that demonstrates their understanding of the synthetic design principles discussed.

Objectives

By the end of the quarter, you will be able to:

- Analyze and discuss the history 2D platforming games, and the design trends represented within them.
- Situate games within a larger social and historical framework.
- Apply design principles to evoke specific feelings and emotions from players at a pre-representational level.
- Articulate the choices and reasons behind specific design decisions in the student's own work.
- Predict the impact of changes within one game system on others (such as level design, enemy design, narrative design, and systems design).

D2L & Materials

There are no textbooks assigned for this course. However, students are responsible for purchasing one game (**Anna Anthropy's Redder**, \$5.00 on Itch.io).

Additionally, there are several other games that are required for this course. These can all be found in the Gameplay Lab (CDM, 5th floor, room 536) or through links posted on D2L. Students may wish to purchase some of these games for ease of access. I also recommend purchasing a good USB game control pad.

We are using D2L (<http://d2l.depaul.edu>) as a platform for this course. All course materials including readings, weekly lecture slides, and class information (syllabus, lesson plan, assignment descriptions) are available through D2L under 'Contents.' You are expected to take notes, prepare questions for discussion, and bring the readings to class each week.

Grade Breakdown

Your grade will be based on the following components, a full description of each along with a grading rubric will be available on D2L as the assignments are posted.

Participation.....	10%
Weekly posts.....	10%
Jumping Prototype.....	10%
Game Design Document.....	20%
Level Flow Prototype	15%
Alpha build.....	35%

A	100-93
A-	92-90
B+	89-87
B	86-83
B-	82-80
C+	79-77
C	76-73
C-	72-70
D	69-60
F	59-0

Course Policies

Participation and Attendance

Participation is a major part of this course, and will be measured across all parts of the course including discussion, in-class production, office hours, online postings, and in-class writing.

Many of the games in this course can take dozens of hours to complete, and I do not expect you to finish each one. However, in order to actively participate in class discussion I ask that you spend at least **3 hours** playing each game.

You are expected to attend all classes and attend all activities. If you miss a class, it is your responsibility to make up work. Please be aware that being absent on a day where you are presenting a game will result in a zero for the critique assignment. Please arrive to class on time, tardiness is disruptive to the class as a whole and will be factored into your participation grade.

Laptops

Much of the material for this course is primarily available online for this course, and the use of laptops is permitted in this course. However, laptops are also an inevitable distraction for even the most well intentioned person. When you don't need a laptop for a specific purpose, such as taking notes or reading a pdf, I ask that you close them down. If you are using your laptop for other purposes, I will ask that you put it away for the remainder of the class.

Attitude & Civil Discourse

A professional and academic attitude is expected throughout this course. Measurable examples of non-academic or unprofessional attitude include but are not limited to: talking to others when the instructor is speaking, mocking another's opinion, cell phones ringing, emailing, texting or using the internet whether on a phone or computer. If any of these issues arise a student may be asked to leave the classroom. The professor will work with the Dean of Students Office to navigate such student issues.

DePaul University is a community that thrives on open discourse that challenges students, both intellectually and personally, to be socially responsible leaders. It is the expectation that all dialogue in this course is civil and respectful of the dignity of each student. Any instances of disrespect or hostility can jeopardize a student's ability to be successful in the course. The professor will partner with the Dean of Students Office to assist in managing such issues.

Late Assignments

I will only accept late assignments if you contact me at least two days before the assignment is due and we come to an agreed upon extension. Assignments submitted late without such an agreement will receive a 10% deduction each day. Please note that due to the grade submission deadline, I may be unable to give an extension on some projects, especially near the end of the term.

College Policies

Changes to Syllabus

This syllabus is subject to change as necessary during the quarter. If a change occurs, it will be addressed during class, posted under Announcements in D2L and sent via email.

Academic Integrity and Plagiarism

This course will be subject to the university's academic integrity policy. More information can be found at <http://academicintegrity.depaul.edu/>. If you have any questions be sure to consult with your professor.

Online Course Evaluations

Evaluations are a way for students to provide valuable feedback regarding their instructor and the course. Detailed feedback will enable the instructor to continuously tailor teaching methods and course content to meet the learning goals of the course and the academic needs of the students. They are a requirement of the course and are key to continue to provide you with the highest quality of teaching. The evaluations are anonymous; the instructor and administration do not track who entered what responses. A program is used to check if the student completed the evaluations, but the evaluation is completely separate from the student's identity. Since 100% participation is our goal, students are sent periodic reminders over three weeks. Students do not receive reminders once they complete the evaluation. Students complete the evaluation online in CampusConnect.

Incomplete

An incomplete grade is given only for an exceptional reason such as a death in the family, a serious illness, etc. Any such reason must be documented. Any incomplete request must be made at least two weeks before the final. For more information on requesting an Incomplete:

<http://www.cdm.depaul.edu/Current%20Students/Pages/Grading-Policies.aspx>.

Academic Policies

All students are required to manage their class schedules each term in accordance with the deadlines for enrolling and withdrawing as indicated in the University Academic Calendar. Information on enrollment, withdrawal, grading and incompletes can be found at: <http://cdm.depaul.edu/enrollment>

Student Rights

You have rights as a student. To learn about your rights as a student please read DePaul's policies located here:

<http://sr.depaul.edu/catalog/catalogfiles/current/undergraduate%20student%20handbook/pg51.html>

Preferred Name & Gender Pronouns

Professional courtesy and sensitivity are especially important with respect to individuals and topics dealing with differences of race, culture, religion, politics, sexual orientation, gender, gender variance, and nationalities. I will gladly honor your request to address you by an alternate name or gender pronoun. Please advise me of this preference early in the quarter so that I may make appropriate changes to my records. Please also note that students may choose to identify within the University community with a preferred first name that differs from their legal name and may also update their gender. The preferred first name will appear in University related systems and documents except where the use of the legal name is necessitated or required by University business or legal need. For more information and instructions on how to do so, please see the Student Preferred Name and Gender Policy at <http://policies.depaul.edu/policy/policy.aspx?pid=332>

Students with Disabilities

Students who feel they may need an accommodation based on the impact of a disability should contact me privately to discuss their specific needs. All discussion will remain confidential. To ensure that you receive the most reasonable accommodation based on your needs, contact me as early as possible in the quarter (preferably within the first week of the course) and be sure to contact the following office for support and additional services:

Center for Students with Disabilities (CSD)
Lewis Center 1420, 25 East Jackson Blvd.
Phone number: (312) 362-8002
Fax: (312) 362-6544
TTY: (773) 325.7296
www.studentaffairs.depaul.edu

Important Dates

Students are encouraged to follow the official calendar at:

<https://academics.depaul.edu/calendar/Pages/default.aspx>

March 30th, Begin Spring Quarter Classes

April 5th, Last day to add (or swap) classes

April 12th, Last day to drop classes with no penalty

April 19th-21st, Easter Holiday – University officially closed

May 17th, Last day to withdraw from Spring classes

May 27th, Memorial Day, University officially closed

June 7th, End of Spring Quarter Classes

June 8th, Spring quarter exams

June 14th, End of Spring quarter 2019

June 21st, Spring grades due

Course Outline

Please note: This lesson plan and assignments are liable to change.

Week 1: Platformer History

This week recounts the history of the platformer genre in two broad waves. Starting with the classic era from *Space Panic* to *Super Mario World* and expanding into the independent game resurgence with *Braid* and *Super Meat Boy*. Further, this week explores the cultural and material conditions of that history, from the available hardware technology to the international market, and from the aesthetic pleasures of slapstick film to the physics of cartoon worlds.

Mon, April 1st

Read: N/A

Play: *Burger Time* (1982)

Wed, April 3rd

Read: K. Thor Jensen, “Run, Jump, and Climb”

Play: *Donkey Kong* (1981), *Super Mario Bros.* (1985)

Week 2: Basic Elements of Running and Jumping

This week we will carefully analyze all the component choices and variables that go into making the most common running and jumping experiences. Students will learn about the interaction between physics, collision detection, animation, and player input. We will discuss what makes controls feel slippery, rigid, precise, or slow. We will use frame-by-frame analysis to decompose how jumps work in particular games.

Mon, April 8th

Read: Steven Swink, “Input Metrics” and “Response Metrics” from *Game Feel*

Play: *Within a Deep Forest* (2006)

Wed, April 10th

Read: Anna Anthropy, “Verbs and Objects” from *A Game Design Vocabulary*

Play: *N++* (2015)

Due: Game Response #1

Week 3: Level Design

This week we explore how the basic elements of a mechanic shape and define the patterns of levels. The variables of running and jumping are extended to discussions of where uncertainty arises in play, and how level design works within and extends the possibility space of a mechanic. Questions of rhythm, pacing, foreshadowing, and recall are addressed.

Mon, April 15th

Read: Patrick Holleman, *Reverse Design: Super Mario World, Section 1-4*

Play: *Super Mario World* (1993)

Due: Jumping Prototype

Wed, April 17th

Read: Holleman, continued, sections 5-12

Play: *Redder* (2010)

Week 4: Enemy Design

Enemies are the level come to life, they respond to player action, create new kinds of dynamic situation, and they are what attack mechanics primarily interact with. This week we will be looking at the feedback loop between mechanics, level design, and enemies and how this creates a range of possible behaviors to draw from. We will discuss approaches to artificial intelligence in enemies, and the way that enemy placement advances a philosophy of social relationships.

Mon April 22nd

Read: Garret Bright, "Build a Bad Guy Workshop"

Play: *Risk of Rain* (2013)

Wed April 24th

Read: Hamish Todd, "Finding the Fun in Medusa Heads in Castlevania"

Play: *Castlevania: Symphony of the Night* (1997)

Due: Game Response #2

Week 5: Attack Mechanics and Sub-Genres

Bop, punch, dash, hold, shoot, bomb, absorb, and many other verbs are often combined with the basic platforming lexicon. This week we explore how these interact to create new kinds of tension, and specific sub-genres such as hack-and-slash, hop-and-bop, and run-and-gun. Discussion of the mechanics and meanings of physical interaction—from violence to intimacy.

Mon, April 29th

Read: Greg Costikyan, “Uncertainty” and “Super Mario Bros.” from *Uncertainty in Games*

Play: *Super Smash Brothers Melee* (2001)

Wed, May 1st

Read: Daniel Johnson, “Mechanic Analysis”

Play: *Metal Slug 3* (2000)

Week 6: 2D Worldbuilding

In the first five weeks we focus on the systems that underpin the game, now we will start to consider how those systems interact with the themes, plot, visual style, and world of your game. We will examine the relation between spatial exploration and plot development, the basic contrasts that platformers afford (horizontal vs. vertical, narrow vs. open, interior vs. exterior, static vs. scrolling, and tiled vs. geometric). We will look at how the camera does the framing work of narration, and we will look at connections with architectural theory.

Mon, May 6th

Read: Jennifer DeWinter “Spatial Narratives” from *Shigeru Miyamoto*

Play: *Small Worlds*

Due: Game Design Document

Wed, May 8th

Read: Gareth Martin, “The Poetics of Progress”

Play: *Rainworld*

Week 7: Game Arc, Motivation, Phase Space

This week we will look at how all the elements we have examined so far come together into a unified experience. We will look at what motivates a player to start, explore, face difficulties, and finish a platforming game. This includes looking at direct motivations such as power-ups, collectables, and time as well as longer term motivations like narrative and difficulty curves. There are also a variety of tools that you, as a designer, have to shift the whole framework of that experience. Power-ups and rule changes allow a player to explore the ‘phase space’ of a game and catch a glimpse of the endless choices a designer whittles down.

Mon, May 13th

Read: David Sirlin, “The Secrets of Donkey Kong Country 2”

Play: *Donkey Kong Country 2* (1994)

Wed, May 15th

Read: Richard Terrell, “Starseed Observatory: Design Space”

Play: *Starseed Pilgrim*

Due: Game Response #3

Week 8: Expressive Possibilities

For the last three weeks, we will look at experimental directions within platform design. Games can be about more than simple fun: they can express deep emotions, invent new ways of seeing the world, or challenge our beliefs. This week we will examine some of the ways platformers communicate and discuss some of the major themes that they bring up, such as what does it mean to have a body, what makes movement beautiful, and how do game rules shape us.

Mon, May 20th

Read: Ted Lauterbach, “Move Right”

Play: *suteF* (2010)

Due: Level Flow Prototype

Wed, May 22nd

Read: Robert Yang, “Level with Me Liz Ryerson”

Play: *Problem Attic* (2013)

Week 9: Other Mechanics and Hybrid Genres

Walking and jumping are incredibly versatile tools that can be combined with dozens of other innovative mechanics. This week we survey a variety of such mechanics including stealth, NPC control, warping, push/pull, and manipulation of space/time/physics. These additions often push platformers towards puzzles, but we will also consider the implications for spatial play, narrative development, and expressivity.

Mon, May 27th

MEMORIAL DAY – NO CLASS

Wed, May 29th

Read: Liz Ryerson, “The Other Side of Jonathan Blow’s Braid”

Play: *Oddworld: Abe’s Oddysey* (1997)

Due: Game Response #4

Week 10: Jumping in the Expanded Field

In our final week we return to look at the core elements of the genre again, jumping and platforms, in light of everything we’ve built. We will consider games that keep most of the conventions of the platformer but subvert jumping itself in several ways. What happens to the levels, enemies, world, motivations, narrative and so on when the core mechanic means something different? Answering this question gives us a chance to reflect on the synthetic approach to design that runs throughout the course.

Mon June 3rd

Read: Alan Williamson, “Three Jumps”

Play: *VVVVVV* (2010)

Wed June 5th

Week 11: Finals Week

Wed June 12th

Due: Alpha Build

Assignments

Please note: The lesson plan and assignments are not part of the syllabus anymore and liable to change.

Participation

Due: Ongoing **Worth:** 10%

Our classroom time will be important for discussing design principles, expressing the aspirations we have for our games, and revealing the places we fall short. Participation is key to your success on all these counts.

Rubric:

Participation in this class will be graded based on your active involvement in classroom exercises, the quality of the questions you ask, how well you listen to your peers, and the quality of constructive feedback you provide to other members of the class. I encourage you to schedule an appointment mid-quarter during office hours to discuss your participation.

Weekly Posts

Due: Wednesday, 4 times during the quarter **Worth:** 10%

Each week we will be bringing new theories together with new games and there are countless combinations that we will never get to discuss. Each week you will be responsible for writing a **300-500 word** post that analyzes a game using one of the frameworks we have examined. You must choose either (A) a game from the current week and a reading from a previous week, or (B) a reading from the current week and a game from a previous week. Your post should describe the design decisions of the game or the cultural meaning those decisions evoke.

Rubric:

Your posts will be graded based on the originality of your insight, the depth to which you examine one precise element, whether you reach the word count, and the clarity with which you express your ideas.

Jumping Prototype

Due: April 15th

Worth: 10%

Early in the quarter I want you to build a sandbox prototype of jumping for a possible game. I will give you an adjective in week 2, and you will need to conform to the following:

- A character controller that can walk and jump
- A character controller that expresses the adjective I gave you
- A character controller that takes input from a game-pad
- A ground object that can be tiled, and which the character controller collides with
- One wall
- 6 platforms each of a different length, placed at different heights, and which the character can reach
- A solid colored square or cube representing the player
- A solid color background
- A solid color for the floor, platforms, and wall
- No sound
- No user interface
- No other objects

While you will be able to build the final game in teams of two, this is an individual assignment. You may use Unity or Game Maker Studio 2.

Rubric:

This project will be evaluated based on how well the class judges your implementation of the adjective, whether you included all the required elements, and how well you technically implement the player controller using the Input-Calculate-Collision-Move method.

Game Design Document

Due: May 6th

Worth: 20%

At this point in the quarter, you should still be playing with your prototypes and should have many ideas for how to develop them further. In order to focus those ideas and map out your next steps, you will be writing them in a Game Design Document. At this point you can make the decision of whether you want to collaborate with someone else in the class, but groups can't be bigger than 2 people. Your GDD should have each of the following elements:

Pitch: A 150-word summary of your game.

World: A ~500-word overview of the narrative and world of your game

Style: A ~300-word description of how the game looks and feels, accompanied by illustrative examples or concept art.

Mechanics: A precise description of your mechanics, including movement, jumping, and at least one idea for a mechanic that makes your game unique. You should include a controller diagram, and describe any ways that these mechanics interact.

State-Machine

Chart: Create a diagram showing what states the character can be in, and how they can transition between those states.

Agents: Design at least 6 different enemy/npc types, there defining characteristics, and an outline of the AI for each.

Level-map: Create a detailed drawing of a sample level for your game. It should be to a consistent scale that makes it clear what jumps the character can make. Show the placement of any enemies, power-ups, moving pieces, or interacting elements, and include labels designating area types and sites-of-interest.

Rubric:

Your GDD will be evaluated based on whether you included all of the elements; your inventiveness designing mechanics, enemies and levels; whether your writing includes enough detail that another person could begin building the game; and the general clarity with which you express your ideas.

Team Option (2 ppl max):

If you've decided to work in a team for your game, you have some additional requirements for the GDD. You need 1 additional mechanic, 3 additional enemies/npcs, and 1 additional level map.

Level Flow Prototype

Due: May 20th

Worth: 15%

Based on the level-map you designed in your GDD, I want you to grey-box a level of your game that is completely traversable. Your level should include each of the following elements:

- ❑ An avatar with an idle animation, run animation, and jump animation (these do not have to be polished, just implemented).
- ❑ An avatar with a polished jump mechanic, working collision detection, and some kind of interaction or attack mechanic
- ❑ A basic camera system (matched to your game's layout, but generally it should follow the avatar)
- ❑ At least one path that takes an expert player more than 60 seconds to navigate
- ❑ At least one kind of enemy, with at least 5 instances. These should be placed in ways that offer different kinds of challenge
- ❑ A way of restarting the level when the player dies
- ❑ Two background layers that move in parallax
- ❑ A transition that leads the character to a sub-room within the level and back.
- ❑ At least one kind of item/collectible, and an inventory system or counter that displays it to the player.
- ❑ A moving platform
- ❑ A platform the avatar can only pass through in one direction

Rubric:

Your level will be evaluated based on whether you include all the required elements, the sense of pacing that you develop with your avatar's movement, the coherence of your spatial storytelling, and the polish that you bring to any of the details.

Team Option (2 ppl max):

If you've decided to work in a team for your game, you have some additional requirements for the level flow prototype. Overall the game should be more polished—one person will be evaluated on the code and one on the game aesthetics. Additionally, your level needs at least 2 60-second paths, at least 2 enemies with 8 instances each, at least 5 sub-rooms, and two kinds of item/collectible.

Alpha Build

Due: June 12th

Worth: 35%

Your final game will be a polished version of the level flow prototype you developed. In addition to all the elements from that prototype, your alpha build should include:

- Adjustments that incorporate any feedback I gave for that prototype
- A thematically designed tileset, or other visual wrapper for the level and enemies
- Animations for all avatar states
- An avatar with all planned mechanics implemented
- A start / options / credit screen with the game's name and logo
- At least three enemies/npcs that behave in significantly different ways
- A destructible object/platform
- At least one item/collectible that alters a basic mechanic in some way
- A situation (water/wind/ice) that alters a basic mechanic in some way
- Background music
- Sound effects
- A user interface that displays any relevant information
- An expressive camera system
- A clear goal for the player to achieve / motivation for traversing the level

Rubric:

Your alpha build will be evaluated based on whether you include all of the required elements, the interaction between mechanics/enemies/level design, whether the whole experience feels coherent, and how well you make use of the expressive qualities of the genre.

Team Option (2 ppl max):

If you've decided to work in a team for your game, you have some additional requirements for the alpha build. Overall the game should be more polished—one person will be evaluated on the code and one on the game aesthetics.