UCLA GAME LAB SUMMER INSTITUTE

# Game Design

## Course Description

This course will introduce students to the fundamentals of game design, such as creating playable characters, designing conflicts and choices, and giving players compelling motivations and goals. Students will work to create their own tabletop game with a focus on game systems, game flow, creativity, and aesthetics. It is the goal of this course for students not only to produce an original game, but also to develop an understanding of how game design really works, and to explore the potential of games for creative expression.

## Objectives

By the end of the course, students have learned:

- The basics of game design and game theory, including ideas about skill vs. chance, meaningful choices, additive and subtractive systems, and asymmetrical games
- How to think critically about game design and game systems
- The process for creating and refining game design through playtesting
- How to collaborate with a team to conceptualize and create a game

## Schedule

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| **Day 1** | **Character creation and introductions**<br>● Create a playable character, with attributes, backstory, motivations, and goals<br>● Introduce character to class<br>**Game groups and game design basics**<br>● Introduction to basic tenets of game design<br>● Partner up in groups to brainstorm a dungeon crawler game students will make, featuring their created characters<br>**Due: Character cards (20 per class), character descriptions, game groups** |
| **Day 2** | **Group game ideas and skill cards**<br>● Students will discuss with instructor their initial game idea<br>● Students will create two additional skill cards for their characters<br>● **Conflicts and obstacles (monster cards)**<br>● Game groups will develop 6 monsters for their dungeon (5 that can appear multiple times, and 1 singular “boss” monster)<br>**Due: Skill cards (2 per character) and monster cards (6 per group)** |
| **Day 3** | **Developing a play space (dungeons)**<br>● Examples of dungeons discussion of dungeon-mapping strategies and requirements |

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| | • Game groups collaborate to design the layout of their dungeons and its features (traps, enemies, treasures, etc.)<br>• Students to turn their character cards into physical character pieces.<br>**Rules and play test**<br>• Discuss how to create game systems for movement/exploration of the dungeon, combat, and winning and losing conditions of the dungeon<br>• Create preliminary rule manual and test out games<br>**Due: Dungeon map, character pieces, and preliminary rule manual** |
| **Day 4** | **Finishing touches and final rules**<br>Final revisions and polish of games and rule manuals<br>Any additional game pieces must be completed<br>**Playthroughs and feedback**<br>Students will play each others' games and then provide feedback to the group about game play, design, characters, and the overall experience of the game<br>**Due: Final game!** |

## Resources

*Playing at the World: A History of Simulating Wars, People, and Fantastic Adventure from Chess to Role-Playing Games,* by Jon Peterson
https://playingattheworld.blogspot.com/

*The Well-Played Game: A Player's Philosophy*, by Bernard De Koven
https://mitpress.mit.edu/books/well-played-game

*Dungeon World* RPG, by Sage LaTorra and Adam Koebel
https://dungeon-world.com/

*Game Design Workshop: A Playcentric Approach to Creating Innovative Games*, by Tracy Fullerton
https://www.gamedesignworkshop.com/

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# Character Design and 3D Animation

## Course Description

Computer games give us avatars to control, and this course provides an introduction in how to create playable characters through modeling and animation. Students will develop a character or avatar, which they will learn how to bring to life through stylized visualization and movement. This emphasis allows students to learn various aspects of modeling and animation as applied through After Effects, a state-of-the-art modeling and animation application.

## Objectives

Students will develop their understanding of character design fundamentals, including:

- The means by which character designers communicate or develop characters through the visual design and motion of the character.
- Principles of animation like squash and stretch, follow-through, and secondary action, which help to create more expressive animation.
- How to apply these character design fundamentals to the creation of their own, fully animated, 3D character, starting with 2D sketches and then moving into 3D modeling and sculpting, texture painting, rigging, animation and, finally, import into Unity.

## Instructor Bio

Nick Crockett makes computer games and experimental animation. He recently completed *Fire Underground*, a feature length fantasy animation which reinterprets the history and prehistory of coal. The project features cursed treasures, awkward touching, software that relies on people behind curtains, and hardware that runs on masking tape and hope. Nick holds a BA in Design | Media Art from UCLA, is an alum of the UCLA Game Lab, and recently completed an MFA at the Carnegie Mellon School of Art.

## Schedule

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| **Day 1** | **Character sketches and modeling basics**<br>**Lecture:** Introduce students to character design basics and get started modeling in Blender<br>**Demo:** Introduction to working in Blender, edit mode, modifiers<br>**Work:** Brainstorm character ideas and create character sketches; begin modeling basic form of creature in Blender<br>**Due: Character sketch and creature basic form** |
| **Day 2** | **Advanced modeling**<br>**Lecture:** Introduce some advanced modeling features<br>**Demo:** Sculpting; texture painting<br>**Work:** Finalize models |

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| | **Due: Final models of creatures** |
| **Day 3** | **Rigging and introduction to animation**<br>**Lecture:** Animation foundations<br>**Demo:** Rigging a character the easy way; animation in Blender; a basic walk cycle<br>**Work:** Rig character and create one animation<br>**Due: Rigged character with one animation** |
| **Day 4** | **Finish animation and import to Unity**<br>**Lecture:** Check in and discussion; troubleshoot individual issues;<br>**Work:** Create two additional animations for your character; import your character to unity, set up a prefab, and export as a UnityPackage.<br>**Due: Your character, with a walk cycle and at least one other behavior, exported as a UnityPackage** |

## Resources

Blender cheat sheet
https://docs.google.com/document/d/1fpcu9C0quoDfp_YXa4TPir0fGAtcOeoJG3LzIKbznGA/edit?usp=sharing

Character design checklist and character info sheet
https://docs.google.com/document/d/15oatBfZorMa3yJRzF3CPXZVmq8pZP115HKaQ7uzsc1k/edit?usp=sharing

12 Principles of Animation
https://www.youtube.com/watch?annotation_id=annotation_195352725&feature=iv&src_vid=HfFj-VQKiAM&v=haa7n3UGyDc

Sculpting in Blender (This YouTube channel has many good blender tutorials.)
https://www.youtube.com/watch?v=tZnUgt659oI&t=32s

Eadweard Muybridge - (Photographer who shot motion studies of people and animals--useful for understanding how different animals move; Google almost any animal + Muybridge.)
http://www.muybridge.org/

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# World Building

## Course Description

Videogames rely on world building to give game environments narrative potential and playful motivation. In this course, students will learn about the concept of world building, and then put this concept into practice by creating a game environment in the Unity game engine (a leading development platform for creating indie/professional games). Students will create multiple environmental elements, such as buildings, plants, terrain, and lighting to build the geography of a game world. The end result will be a navigable environment that expresses the creative decisions of each student.

## Objectives

Through lectures, technical exercises, class discussions, and self-directed studio time, students will learn concepts and acquire skills related to world building in the context of game design. We will survey the history of world building as a practice in a variety of creative fields, and critically examine a range of virtual and physical environments. In terms of technical skills, students will learn the basics of the Unity platform, how to work with models and materials, and how to read and edit scripts. Students will then conceptualize a world through a sketch and proposal, receive feedback from their classmates, and build their world using skills they've learned. We hope to foster a collaborative learning environment where students can learn from their peers in addition to the instructor.

## Schedule

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| **Day 1** | **Intro and ideation**<br>Introduction to world building and examples<br>Intro to building 3D scenes in Unity<br>Intro to critique<br>Drawing and writing to sketch out world<br>Critique<br>**Due: Simple scene in Unity, proposal for world (drawing or written proposal)** |
| **Day 2** | **Assemblage and navigation**<br>Lecture on assemblage as an approach to world building<br>What are 3D models?<br>Intro to navigation in Unity<br>Critique<br>**Due: Navigable sketch of world in Unity** |
| **Day 3** | **Animation and sound**<br>Lecture on physics-based animation and sound |

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| | Add physics-based animations to scene using scripts from grabbag<br>Add sound to scene<br>Critique<br>**Due: World with simple animations and sounds** |
| **Day 4** | **Atmosphere and final touches**<br>Lecture on atmosphere<br>Incorporate lighting and materials into scene<br>Critique<br>Open studio time<br>Document projects<br>**Due: Final builds for projects, screenshots, and description of project** |

## Resources

Unity tutorials
https://unity3d.com/learn/beginner-tutorials

Assemblage
https://www.tate.org.uk/art/art-terms/a/assemblage

Appropriation
https://www.tate.org.uk/art/art-terms/a/appropriation

David Kanaga (game designer and composer) interview
https://medium.com/@everestpipkin/an-interview-with-dog-opera-manager-and-koch-games-employee-david-kanaga-on-oikospiel-book-i-452c10c2f76a

Models resource
https://www.models-resource.com/

Sketchfab
https://sketchfab.com/

An Introduction to procedural animation
https://www.alanzucconi.com/2017/04/17/procedural-animations/

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# Game Programming

## Course Description

Videogames rely on programming or code to express movement and collision, provide spaces for interaction, and capture player input. This course introduces students to the fundamentals of game-related coding while developing a playable videogame. Using a creative graphics programming toolkit and library for creating games, students will finish building a videogame, playtest the results, and make refinements as part of an iterative design process (a common approach to game design in indie and professional game development).

## Objectives

Students in the course will:

- Learn how to translate a personal, creative vision into a coded, playable game.
- Become familiar with a browser-based coding environment (p5.js) and basic JavaScript for game development.
- Understand the roles of variables, functions, and conditional statements in coding--and learn how those are used to create fundamental game behaviors, movement, player input, simple AI, graphics, and sound.
- Get exposure to visual, interactive, game-making tools (such as a level editor) that are used in conjunction with coding to prepare game assets.

## Schedule

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| **Day 1** | **Creating a player (programming first steps)**<br>Introduction to programming as a discipline. Get started with the p5.js editor and p5.play. Learn about variables, sprites, getting input, and motion in 2D.<br>**Due: A working player character who moves and shoots projectiles via keyboard input** |
| **Day 2** | **Creating the game environment**<br>Conditional statements, functions, detecting and handling collisions, and basic game logic.<br>**Due: A game world with impassable walls, collectible items, and a game over screen** |
| **Day 3** | **Game graphics and NPCs**<br>Animation creation and control, NPC behavior/AI, and level design.<br>**Due: Finalized game design, and rough draft of game with art** |

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| **Day 4** | **Finishing up**<br>Finish game system, playtest, refine graphics, game feel, and level design.<br>**Due: Final game!** |

## Resources

p5.js
https://p5js.org/get-started/

p5.play
https://molleindustria.github.io/p5.play/

*The Coding Train* (Youtube channel)
https://thecodingtrain.com/

*Making Games With p5.play***,** by Allison Parrish (free online class)
https://creative-coding.decontextualize.com/making-games-with-p5-play/

Open Processing Examples Page (website)
https://www.openprocessing.org/browse/#

*Rise of the Videogame Zinesters: How Freaks, Normals, Amateurs, Artists, Dreamers, Drop-outs, Queers, Housewives, and People Like You Are Taking Back an Art Form,* By Anna Anthropy (book)
https://www.amazon.com/Rise-Videogame-Zinesters-Drop-outs-Housewives/dp/1609803728

*Form and Code* (book)
By Casey Reas & Chandler McWilliams
https://www.amazon.com/Form-Code-Design-Architecture-Briefs/dp/1568989377/ref=sr_1_1?keywords=Form+and+code&qid=1562640091&s=books&sr=1-1