Fall 2019

IT 286-001: Foundations of Game Production

Bo Thompson

Foundations of Game Production

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Course: IT286 Fall 2019
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Academic Integrity

The NJIT Honor Code will be upheld at all times. The work you do and submit is expected to be the result of your effort only. You may discuss the high level (general) solution of a design problem, however, cooperation should not result in one or more student having possession of copied graphics, code, or any other project element created by another student or outside entity unless specifically authorized by your instructor on a case by case basis. Any violations of the NJIT Honor code will be brought to the immediate attention of the Dean of Students.

Overview

This course will be a production-focused examination of mechanical game design and the process of developing and iterating on a playable concept. Students will be tasked with creating their own fully developed proof-of-concept with accompanying game design document following a set of specific criteria. Ideas will be explored in how to analyze and design specific facets of games as well as the steps in production required to understand workflow, scope, and methods of design validation. Students will be required as part of their design document and design challenges to provide **constructive** feedback to at least three other students via moodle. Iteration and communication is a vital part of the development cycle and so students should expect special attention to be paid to both.

Grading

• Midterm Exam	10%
• Final Exam	20%
• Design Challenges	10%
• Midterm Project	20%
• Final Project	20%
• Design Document	20%

Extra Credit opportunities which will exist within the course are as follows:

• Extracurricular Hours Utilization	5%
• Midterm Project Stretch Goal	2.5%

• Final Project Stretch Goal	2.5%

No further opportunities for extra credit will be considered.

Submission Criteria

All work for the class must follow a set of submission guidelines to be eligible for grading.

- Each student will create a moodle thread on the Projects board where they will post any and all posts for game design documentation and updates for their projects. All game design documentation **must** be both housed within a google doc which permits comments to be posted by your instructor and fellow students **AND** a matching pdf which will be submitted within moodle by the deadlines outlined in the course schedule below.
- Project Submissions will be provided within moodle for students to post a README as well as a github link and commit SHA, a pdf of their design document for that build and a zip file for any additional assets necessary. Should this not suffice, students are **required** to notify their instructor in advance of the deadline and receive clarification for submission.
- Each student will create a moodle thread **per assignment** in the Design Challenges board where they will post any and all work for each of the design challenges. The exact format for each will be described in class on the days in which those design challenges are listed in the course schedule below.
- Each student will be required to provide at least 3 feedback statements examining the design documents of their classmates in the form of moodle posts and comments within google docs. Each feedback statement will be expected to be a developed thought representing one or more paragraphs and students will provide a link within their moodle post to each of the comments that they have offered. Unconstructive feedback will NOT be tolerated and may result in penalties to your grade.

Late Policy

Midterm and Final Projects: Due by midnight after your presentations. Each day after the due date for the project will result in 1% of the project's value to your final grade lost. Date of completion for your project the purposes of lateness will be determined based upon the datetime stamp of the commit for your project.

All Other Assignments: Due by midnight Sunday night / Monday morning as listed within the course schedule below. You will be reminded of upcoming deadlines within the course but they are your responsibility to meet. Failure to submit by the deadline for will result in a 25% penalty to the assignment per week late. Do not allow assignment deadlines to slip if possible.

Failure to adhere to this late policy will result in penalties to your grade up to and including removal of all credit for an assignment. In the event that you cannot submit your assignment in keeping with this policy, it is your responsibility to discuss the matter with your instructor at the earliest available opportunity so as to get clarification for when your work is due.

Course Materials

This course will require each student to have a laptop capable of running the Unity Game Engine.

Course Topics

The following topics will be covered over the course of the semester:

- Flowcharting
- Object-Oriented Design
- Design By Contract Methodology
- Version Control Software
- Developmental Workflow
- Mechanical Design
- Level Design
- Game Scripting
- Entity Component System
- Econometrics
- Zero Sum Games
- Competitive and Cooperative Design
- Project Management Techniques
- Unity Game Engine
- Tools Development
- Scope Management

Course Schedule

Each class will be broken down into a lecture period expected to run for approximately one half of the class followed by an in-class opportunity to work on your own projects, design documents, or the design challenges. The class will finish with a brief stand-up period where students will present to their peers their current progress and concerns.

Week 1	Review of Syllabus	
	Game Design Archetypes / Models	
	Introduction to Game Design Documents	
	In-class Activity	Install Unity and Brainstorm Game Concepts
	Due Next Week	(Nothing)
Week 2	Feedback Loops	
	Skill Atoms	
	Introduction to Unity	
	In-class Activity	Design Document Hypothesis

		Implement a Game Archetype
	Due Next Week	First Pass at Game Design Document
Week 3	Introduction to Game Balance Principles	
	Depth and Complexity Analysis	
	Reward Mechanisms	
	In-class Activity	Midterm Project Meetings Live Analysis - Archetypes, Complexity/Depth, Rewards
	Due Next Week	Initial Project Proposal + Feedback
Week 4	Scaffolding	
	Object-Oriented Design	
	Genre Analysis	
	In-class Activity	Live Analysis - Scaffolding and Systemic Design
	Due Next Week	GDD Development - Analysis of Comparable Game + Feedback
Week 5	Managers and Control Systems	
	Design By Contract	
	Versioning and Collaboration Techniques	
	In-class Activity	Midterm Project Lab - Github Setup and Assistance
	Due Next Week	Design Challenge #2 / Feedback
Week 6	Game Theory	
	Zero Sum Games	
	Econometric Analysis	
	In-class Activity	Live Analysis - Econometrics and Competition Elements
	Due Next Week	Updated Game Design Document
Week 7	Review for Midterm Exam	
	In-class Activity	Midterm Project Lab - Assistance and Directed Study
	Due Next Week	Design Challenge #3 / Feedback
Week 8	**Midterm Exam**	
Week 9	**Midterm Project Presentations**	

Week 10	Cooperative and Competitive Design	
	Guiding Players By Design	
	Validation Testing for Quality Assurance	
	In-Class Activity	Design Challenge #4 - Multiplayer Redesign
	Due by Sunday	Updated Game Design Document
Week 12	Artificial Intelligence Planning	
	Pathfinding and Navigation	
	Procedural Content Generation Planning	
	In-Class Activity	QA Peer Testing
	Due by Sunday	Design Challenge #4 / Feedback

Week 12	Thanksgiving Recess - No Class!	
Week 13	Tools Development	
	Unity Developer Features	
	Profiling	
	In-Class Activity	Design Challenge #5 - Tool Development
	Due by Sunday	Updated Game Design Document
Week 14	Review for Final Exam	
	In-Class Activity	Final Project Lab / Study
	Due by Sunday	Design Challenge #5 / Feedback
Week 15	**Final Exam**	
Week 16	***** READING DAY *****	
Week 17	**Final Project Presentations**	

*Syllabus subject to change, attend class to keep up to date.