CTK 380.5 Introduction to Game Development
Course Syllabus

Instructor: Sercan Sengun
Email: ssengun@ilstu.edu

IMPORTANT: Some parts of this syllabus have been redacted.

COURSE OVERVIEW

Description

The course focuses on the digital game development process. It involves students in the process of developing two digital games using Unity 3D Game Engine and C# Scripting Language, while discussing the current practices and industry standards of digital game development scene. One of the games will be a 2-D game and the other will either be a 2.5- or 3-D game. The course consists of hybrid lectures/labs where students will see (and give) presentations, discuss, and have time to work on their projects and get feedback from the instructor and others.

This course is heavily project-driven and studio-oriented. Students will form teams (or work alone) to revamp two asset and code bases that will be developed and taught in class to produce two games of their choice—one during the first and the other during the second half of the course. These two accelerated development cycles allow students to experience different team dynamics, project management styles, and processes. Each development cycle will have the following milestones:

1. Game Pitch
2. High Level Design Document (HLDD), including a prototype and project plan
3. Playtest Report
4. Prototype, including a postmortem on how to iterate and refine to develop a complete game

Learning Objectives

After the course, you should be able to:

- Learn the basics of using Unity 3D to develop popular game genres
- How to iterate and refine to develop a complete game
- Project and team management

Delivery

The course will be taught in a combination of lecture and in-class and out-of-class assignments that demonstrate knowledge and understanding of the subject through applying the concepts. Students are expected to apply concepts learnt and identify them in existing or newly designed games.

GRADING POLICY

Grading Table

Item	**Points**
Attendance & Class Participation	20
Semester Assignments	20
Game Project #1	30
Game Project #2	30
Total	100

Game Project

Each game project will be developed alone or up to a group of 3-4 students. A project includes four deliverables:

- **Game Pitch:** A 10-minute group presentation delivered in class.
- **High Level Design Document:** A document that is both submitted and presented by the team in class. The document should adhere to the template.
- **Playtest Report:** A testing report discussing the methods used and test results with at least a few user groups.
- **Prototype and project postmortem:** A team presentation of a playable prototype of the game in class as well as a project postmortem. The team will prepare and present an analysis and reflection of their project process: what worked well, what didn't, what the team learned about project management and development, and what it will do differently as a result.

Deliverables can and should be discussed with the instructor prior to scheduling a formal presentation. Once the team formally presents them before class, they will be critiqued on content and presentation and be graded.

Game Project Rubric Details

Item	**Points**
Game Pitch	3
HLD Document	4
Playtest Report	5
Prototype (3 point for each: Quality, Usability & User Experience, Innovation, Completeness, Cohesion)	15
Process Postmortem	3
Total	30

Your final grade is calculated by summing all the acquired points and by converting them to a letter grade. You should not expect a curve to be applied.

A – 100-90
B – 89 -80
C – 79-70
D – 69-60
F – 50 and below
I – Incomplete

SCHEDULE

WEEK-1

Day #1: Introduction	**In today's class:** - Self-introduction - Student self-introductions - Curriculum overview and expectations from the course
	TO-DOs for next class: **Install Unity:** Before coming to this class please: - Install Unity Hub from unity.com

	- Download the latest version of Unity - Create an account at unity.com **Also watch:** - Steven Johnson: Where do good ideas come from? - Kathryn Jablokow: Creative diversity
Day #2: Navigating Unity & Concept Development	**In today's class:** - Discussion about concept development and creativity - Introduction to Unity UI and basic navigation.
	TO-DOs for next class: **50 Game Ideas:** Create your 50 Game Ideas list

WEEK-2

Day #1: Variables	**In today's class:** - Start the 1st Project - Create our player - Variables in C# - transform.Translate() - transform.position - Input.GetAxis()
	TO-DOs for next class: Coding Challenge #1
Day #2: 50 Game Ideas & Prefabs and IF Statements	**In today's class:** - 50 Game Ideas - IF Statements - GetKeyDown() - Prefabs - Instantiate() - Destroy()
	TO-DOs for next class: **Make a pitch:** Create your own an idea for a version of this shooter game and get ready to make a pitch: (1) elevator pitch; (2) 10-minutes pitch. **Also watch:** 1) Rami Ismail: In 3 Sentences or Less: Perfecting Your Pitch 2) Brian Upton: 30 Things I Hate About Your Game Pitch

WEEK-3

Day #1	**NO CLASS!** Labor Day

Day #2: Collision (Rigidbodies and Colliders)	**In today's class:** - Elevator pitches and voting - Collisions (Triggers, Rigidbodies, and Colliders) - Random.Range()
	TO-DOs for next class: Coding Challenge #2
	TO-DOs for next class: **Kickstarter Aspirations:** There are a lot of great game pitch videos in Kickstarter: https://www.kickstarter.com/discover/categories/games. As a team, choose 3 game projects (recent or past) that have amazing pitches. Use these aspirations to fine tune your own pitch. To avoid overlapping, each team will paste their selected game list to Slack. **Google GDDs:** The internet is full of GDDs—both for big and small games. Find a GDD and paste its link to Slack. Be prepared to say a few sentences about it in the class (e.g., what did you like about it; what you did not like about it; what surprised you about this document, etc.) **Also:** 1) Watch: Stone Librande: One-page Designs 2) Read: Tim Ryan: Anatomy of a Design Document

WEEK-4

Day #1: Coroutines, While Loops	**In today's class:** - Script Communication - Coroutines - While Loops - Introduction to working with sprites - GetComponent<>
	TO-DOs for next class: Coding Challenge #3
Day #2: Pitching and GDD	**In today's class, we will:** - Look at the kickstarter pitches that you like - Look at the game design docs that you like (you will present them) - Talk about GDDs and see some samples of my own - Work a bit on teams and ideas for the 1st project From now on, you can start your own GDD for the 1st project.

WEEK-5

Day #1: Switch Statements, Arrays, Animation Controllers	**In today's class:** - Switch Statements - Arrays - Animations and animation controllers
	TO-DOs for next class: Coding Challenge #4
Day #2: Child/Parent Objects, Custom Methods, UI Text and Images	**In today's class:** - Child/Parent game objects - Custom methods with parameters or arguments - Introduction to UI in Unity - GameObject.SetActive() - GameObject.Find()
	TO-DOs for next class: Coding Challenge #5 **Also:** 1) Watch: Extra Credits: Working Conditions 2) Watch: Pretty Good Gaming: Devs Discuss the Burnout 3) Read: Meredith Hall: Choosing A Project Management Tool for Game Development 4) Read: Heather Maxwell Chandler: Production Values: The Value of Project Management

WEEK-6

Day #1: Working with Multiple Scenes, UI Buttons	**In today's class:** - Insights and discussion about project management - Working with multiple scenes (SceneManager) - Adding buttons to UI
Day #2: Animation States and Parameters	**In today's class:** - Animation states and parameters - Animation.SetTrigger() Also, today, we will be officially kicking off the 1st Project production!
	TO-DOs for next class: **Post-Processing:** Use this menu to download and install the Post Processing Stack (Window > Package Manager > Install Post Processing). 1) Watch: Mark Barrett: Hitchhiker's Guide to Rapid Prototypes! 2) Watch: Eitan Glinert: Rapid, Iterative Prototyping Best Practices 3) Read: Zack Hiwilller: Players Making Decisions Chapters 5 to 8

WEEK-7

Day #1: Post-Processing, Working with Audio	**In today's class:** - Using Post-processing stack - Working with Audio - AudioSource.Play() - AudioSource.PlayClipAtPoint()
	TO-DOs for next class: Export your prototype! One for browser and one for your OS.
Day #2: Prototyping and Playtesting, Work on Your Games	**In today's class:** - Discussions about prototyping and playtesting - Use the rest of the time to work on your projects

WEEK-8

Day #1	**In today's class:** We will use this week's classes to work on your projects.
Day #2	

WEEK-9

Day #1: Reflections	**In today's class:** - Check the outcomes of the projects and discuss group's reflections - Setup a transition project
Day #2: Character Controller	**In today's class:** - Physics Character Controller - Controller.Move() - 3D Colliders - Vector3.MoveTowards()
	TO-DOs for next class: Coding Challenge #6

WEEK-10

Day #1: New 3D Project! Lighting and Sky Box	**In today's class:** - Finalizing transition project - Setup for 3D Game - Lighting: Directional Lights, Point Lights, Reflection Probes - Sky Boxes

	TO-DOs for next class: Add lights to the scene. Experiment! Replace the provided sky box with another free one that you downloaded from the Unity Store.
Day #1: Character Controller, Local vs. World Space, Temporary Variables	**In today's class:** - More on Character Controller - Local vs. World Space - transform.TransformDirection() - transform.LocalEulerAngles()
	TO-DOs for next class: Watch: "Games User Research Bootcamp: Running a Study"

WEEK-11

Day #1: Navigation Mesh, Raycasting	**In today's class:** - Navmesh Baking and Agent Component - Cursor methods - Raycasting - ScreenPointToRay() - ViewportPointToRay()
Day #2: Finalizing Raycasting	**In today's class:** - Advanced User Studies: How and why? - Finalizing Raycasting - Physics.Raycast()

WEEK-12

Day #1: 3D Collision Colliders, Inventory	**In today's class:** - More on 3D Collision Colliders
	TO-DOs for next class: Coding Challenge #7 **Post-Processing:** Use this menu to download and install the Post Processing Stack (Window > Package Manager > Install Post Processing).
Day #2: Working with Multiple Cameras	**In today's class:** - Post-processing - Working with multiple cameras Also, today, we will be officially kicking off the 2nd Project production!

WEEK-13

Day #1: **Pitching!**	**In today's class:** - Pitch ideas and form groups for the 2nd Project. Discuss details. - Create a basic design documentation of the things you need to do.
Day #2: **GDD**	**In today's class:** - Present your initial design documentation and start production.

WEEK-14

Day #1	**In today's class:** We will use this week's classes to work on your projects.
Day #2	

WEEK-15

NO CLASS! Thanksgiving!

WEEK-16

Day #1	**In today's class:** We will use this week's classes to finalize your projects.
Day #2	

Finalize and submit your 2nd projects till the end of finals week!
We will arrange a final play day for all the projects throughout the semester where we invite other students and faculty members to playtest your games. Time and location to be finalized.