IUCA-GAMEDEV, Game Development

International University of Central Asia
Department of Information Technologies

1   Course Information

Course ID
    IUCA-GAMEDEV

Course Repository
    `https://github.com/iucau/iuca-gamedev`

Class Discussions
    `https://piazza.com/iuca.kg/spring2019/iuca-gamedev`

Place
    Room 217

Time
    Tuesday, 11:05–12:25
    Thursday, 11:05–12:25

2   Prerequisites

Object-oriented Programming

3   Contact Information

Instructor
    Toksaitov Dmitrii Alexandrovich
    toksaitov_d@iuca.kg

Office Hours
    Remotely through Skype at toksaitov@hotmail.com

4   Course Overview

The course introduces students to the topic of game development. It covers theory and practice of video game production. It delves into the fields of computer graphics, computational physics, artificial intelligence, and game-play design. During the

course students will get an opportunity to build market-ready games for desktop, web, or mobile platforms. Students will learn on how to use the Unity game engine, the leading game authoring tool on the market. Students will also take a look on a popular alternative, Unreal Engine 4. Finally, they will be introduced to the topic of building a simple game engine from scratch on their own.

5   Topics Covered

Introduction and Linear Algebra Overview
     Week 1: Introduction, History, Industry Overview
     Week 2: Vectors
     Week 3: Matrices
     Week 4: Space Transformation

The Unity Game Engine
     Week 5: The Unity Editor
     Week 5–7: The C# Language in the Unity Environment
     Week 8: The Unity OOP Model
     Week 9–11: The Graphics, Physics and UI Subsystems
     Week 12: The AI Subsystem

Unreal Engine and Custom Engine Development
     Week 13–14: Unreal Engine 4 Overview
     Week 15–16: Building Your Own Game Engine

6   Examinations

Students will get midterm and final examinations in the form of two quizzes with multiple choice questions. Both examinations will be about linear algebra topics for use in game development.

7   Practice Tasks

Students will have to finish several practice tasks. In each task they will have to create simple clones of classic video games from various genres.

8   Course Project

Throughout the course, students will have to create a game on their own or together with another student in a team. It is up to the student or the team to select the type of the game to make.

9 Presentation

Students will have to make one presentation about any market game of their choice. The presentation should be focused on the game's internals, its development or production process, and tools or techniques used to create it.

10 Reading

3D Math Primer for Graphics and Game Development, Second Edition by Fletcher Done and Ian Parberry (ISBN: 978-1-4398-6981-9)

10.1 Supplemental Reading

1. Game Development Essentials: An Introduction 3rd Edition by Jeannie Novak (ISBN: 978-1111307653)

2. Game Coding Complete, Fourth Edition by McShaffry and David Graham (ISBN: 978-1133776574)

3. Game Engine Architecture, Second Edition by Jason Gregory (ISBN: 978-1568814131)

4. Game Programming Patterns by Robert Nystrom (ISBN: 978-0990582908)

5. Mathematics for 3D Game Programming and Computer Graphics, Third Edition by by Eric Lengyel (ISBN: 978-1435458864)

11 Grading

- Class participation (through Piazza) (5%)

- Presentation (10%)

- Midterm (15%)

- Final (20%)

- Practice tasks (20%)

- Course project (30%)

- 94%–100%: A
- 90%–93%: A-
- 87%–89%: B+
- 84%–86%: B
- 80%–83%: B-

- 77%–79%: C+
- 74%–76%: C
- 70%–73%: C-
- 67%–69%: D+
- 64%–66%: D
- 60%–63%: D-
- Less than 60%: F

12   Rules

Students are required to follow the rules of conduct of the Department of Information Technology and International University of Central Asia.

Team work is NOT encouraged (except for the course project). Equal blocks of code or similar structural pieces in separate works will be considered as academic dishonesty and all parties will get zero for the task.