**ABET Course Syllabus – CS4556**

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| **Code** | CS4556 | **Credits** | 3 |
| **Title** | Multiplayer Online Game Design and Development | **Coordinator** | Eun-Young Kang |

**Course Information**

1. **Catalog Description:** MMORP games from design through development and launch; real-time 3D graphics programming; network programming for multiplayer architecture; other issues related to game development and publishing.
2. **Prerequisites:** CS 3112 and CS3220
3. **Contact Hours:** Lecture 3 hours
4. **Required/Elective:** This course is an elective in the BS program.

**Textbook**

No formal textbook; Online materials compiled and provided by the instructor.

**Course Goals**

The Student Learning Outcomes that are addressed by the course are:

*SLO #1. Students will be able to apply concepts and techniques from computing and mathematics to both theoretical and practical problems.*

*SLO #2. Students will be able to demonstrate fluency in at least one programming language and acquaintance with at least three more.*

*SLO #3. Students will have a strong foundation in the design, analysis, and application of many types of algorithms.*

*SLO #5. Students will have the training to analyze problems and identify and define the computing requirements appropriate to their solutions.*

*SLO #6. Students will have the training to design, implement, and evaluate large software systems working both individually and collaboratively.*

*SLO #7 Students will be able to communicate effectively orally and in writing.*

*SLO #8 Students will have the knowledge, skills, and attitudes for lifelong self-development.*

*SLO #9 Students will have the ability to analyze the local and global impact of computing on individuals and society..*

*SLO #7. Students will be able to communicate effectively orally and in writing.*

Other outcomes of instruction. At the end of the course, students are able to

1. Describe design and development processes of a Multiplayer Online Game (MOG).

2. Explain and describe topics, issues and solutions in game math, collision detection, and physics, 2D/3D graphics, animation, and network games.

3. Acquire skills in 3D modeling and animation, Game Engines Programming, Game Client Programming, and Game Server Programming.

4. Prototype a 3D Multiplayer Online Game using a Game Engine.

5. Produce documents for multiple teams to exchange ideas.

6. Develop and manage timeline with milestone for a large project and deliver outcomes accordingly..

**Topics covered**

1. Introduction to Game Programming
2. Game Programming Languages
3. Basics of Mathematics and 3D Computer Graphics
4. Game Assets
5. Game Engines and Development of a Single Player Game
* Camera and Player Controls
* Collisions
* Multimedia and GUI
* NPC (Non Player Character) and AI
1. Development of a Multiplayer Online Game
* Introduction to Networking
* Challenges of Game Networking
* Types of Network Games
* Multiplayer Game Architecture
* Game Server and Network Programming
* Persistent Data and Database Systems
* Network Communication Issues and Solutions
* Testing Network Games
* NPC Controls