DEREE COLLEGE SYLLABUS FOR:

ITC 3137 GAME DEVELOPMENT   **3/1.5/3**
(Previously: ITC 3237 GAME DEVELOPMENT)   **UK LEVEL: 5**
(Updated Fall 2023)   **UK CREDITS: 15**

PREREQUISITES:	ITC 2088 Introduction to Programming **or** ITC 2053 Introduction to Game Programming
COREQUISITES:	None.
CATALOG DESCRIPTION:	Game development approaches, tools and techniques. Manipulation of visual effects and sound. Object animation. Movement control. Worlds. Interactive environments.
RATIONALE:	The course introduces students to the programming techniques for game development. Students are exposed to game scene creation, characters and animation forms, interactive objects and special effects and apply techniques that control 2D and 3D environments.
LEARNING OUTCOMES:	As a result of taking this course, the student should be able to: 1. Demonstrate understanding of object movement, animation and modification techniques. 2. Develop interactive objects using a variety of techniques including geometry and artificial intelligence 3. Compose 2D or 3D dynamic worlds enhanced with special effects. 4. Assess game performance.
METHOD OF TEACHING AND LEARNING:	In congruence with the teaching and learning strategy of the college, the following tools are used: • Classroom lectures, discussions, and review of real-world cases based on specific theoretical concepts. Laboratory practical sessions. • Office hours: Students are encouraged to make full use of the office hours of their instructor, where they can ask questions and go over lecture material. • Use of the Blackboard Learning platform, where instructors post lecture notes, assignment instructions, timely announcements, as well as additional resources.
ASSESSMENT:	**Summative:** <table><tr><td>1st assessment: Coursework development of game objects</td><td>20%</td></tr></table>

Summative:

1st assessment: Coursework development of game objects	**20%**
2nd assessment: Portfolio of student work and oral assessment	**10%**
Final assessment: Project Complete implementation of a simple game in a programming platform//performance assessment	**70%**

Formative:

In-class and take-home exercises	**0%**

The formative assessments aim to prepare students for the summative

	assessments and expose them to teamwork.
	The 1st summative assessment tests the LOs 1, 2. The 2nd summative assessment tests the LOs 1-4. The final summative assessment tests the LOs 1-4. *The final grade for this module will be determined by averaging all summative assessment grades, based on predetermined weights for each assessment. If students pass the **final summative assessment,** which tests all Learning Outcomes for this module, and the average grade for the module is 40 or above, students are not required to resit any failed assessments.*
INDICATIVE READING:	**REQUIRED READING:** 1. Albahari, J. & Albahari, B. (2017). C# 7.0 in a Nutshell: The Definitive Reference (7th edition). Sebastopol, CA: O'Reilly 2. Instructor's notes. **RECOMMENDED READING:** 1. Dunn, F., & Parberry, I. (2011). *3D math primer for graphics and game development (2nd ed.).* Boca Raton, FL: A K Peters/CRC Press. 2. Eberly, D. (2010). *Game physics (2nd ed.).* Amsterdam: Morgan Kaufmann. 3. Eden, R. (2014), *jMonkeyEngine Cookbook,* Packt 4. Gregory, J. (2009), *Game Engine Architecture,* A K Peters/CRC Press 5. Kusterer, R. (2013), *jMonkeyEngine 3.0 Beginner's Guide,* Packt 6. Lake, A. (2010), *Game programming Gems,* Cengage Learning 7. Lengyel, E. (2011), *Mathematics for 3D Game Programming and Computer Graphics*, 3rd Edition, Cengage Learning 8. Rabin, S. (n.d.). *Game AI pro²: Collected wisdom of game AI professionals.*
INDICATIVE MATERIAL: *(e.g. audiovisual, digital material, etc.)*	**REQUIRED MATERIAL:** 1. Vector Math for 3D Computer Graphics: http://programmedlessons.org/VectorLessons/vectorIndex.html#09 2. Jmonkey tutorials: http://hub.jmonkeyengine.org/wiki/doku.php **RECOMMENDED MATERIAL:** 1. Game Developers Conference: http://www.gdconf.com / 2. Course on Game Development http://tuftsdev.github.io/GameDevelopment/ 3. Courses in Game Development http://soshable.com/5-cool-totally-free-game-design-and-development-courses / 4. Procedural Content Generation http://larc.unt.edu/ian/research/content/ 5. Jmonkey video tutorials: http://hub.jmonkeyengine.org/wiki/doku.php/sdk 6. ACM Computer Graphics Conference http://s2016.siggraph.org / 7. OpenGL: https://www.opengl.org/
COMMUNICATION REQUIREMENTS:	Daily access to the course's site on the College's Blackboard CMS. Communication using proper written and oral English.

	Use of word processing and/or presentation graphics software for documentation of assignments.
SOFTWARE REQUIREMENTS:	MS-Office Unity Unreal Engine jMonkeyengine
WWW RESOURCES:	• Unity: http://www.unity3d.com • Unreal: https://www.unrealengine.com/en-US/ • jmonkey : http://jmonkeyengine.org/downloads/ • Hellenic Gamers Association: http://www.hgda.gr/ • Game Programming : http://www-cs-students.stanford.edu/~amitp/gameprog.html • Art assets for game programming: http://letsmakegames.org/resources/art-assets-for-game-developers • http://www.blender-models.com • Game Development Stack Exchange: http://gamedev.stackexchange.com • Game developer net • http://www.gamedev.net/page/index.html • Artificial Intelligence for Game Programming: http://www.gameai.com http://www.raywenderlich.com/24824/introduction-to-ai-programming-for-games • Steering behaviour for characters: http://red3d.com/cwr/steer / • Gamasutra: news, ideas: http://www.gamasutra.com / • Research in games: http://game.itu.dk/index.php/About • Research in games: http://game.itu.dk/index.php/About • Unity game engine: https://unity3d.com/ • Cry game engine download: http://cryengine.com/
INDICATIVE CONTENT:	1. Introduction to game development 2. Geometric transformation of objects: translation, rotation, scaling 3. Game scene creation 4. Characters and animation techniques 5. Interaction 6. Computer graphics 7. Collisions 8. Physical properties 9. Special effects 10. Artificial Intelligence in games 11. Software issues: controls, application states, best practices 12. Deployment 13. Network game concepts 14. Topics in game programming