

DEREE COLLEGE SYLLABUS FOR: :		3/0/3
ITC 2153 INTRODUCTION TO GAME DEVELOPMENT (Previously ITC 2153 Game Development using UNITY) (updated Spring 2018)		
PREREQUISITES:	CS 1070 Introduction to Information Systems or ITC 1070 Fundamentals of Information Technology	
CATALOG DESCRIPTION:	Game development fundamentals; basic 3D graphics concepts; combining and utilizing multimedia content using a game engine; creating and editing scripts using appropriate programming / scripting languages	
RATIONALE:	<p>This is a project oriented course aiming to expose students to game development using an established game engine (and its associated scripting / programming language) as a platform. Students will be introduced to the game development process, they will learn how to use the game engine in order to develop games combining 2D and 3D models and other multimedia assets. They will also be exposed to game engine scripting.</p> <p>The course addresses students who are interested in game development and do not necessarily possess advanced programming or 3D modelling skills.</p>	
LEARNING OUTCOMES:	<p>As a result of taking this course, the student should be able to:</p> <ol style="list-style-type: none"> 1. Integrate media elements including graphics, video and audio using an established game engine. 2. Use of a scripting language to animate and control game objects. 3. Apply the appropriate development process and workflow for a game created in an established game engine. 	
METHOD OF TEACHING AND LEARNING:	<p>In congruence with the teaching and learning strategy of the College, the following tools/activities are used:</p> <ul style="list-style-type: none"> • Classroom lectures. Laboratory practical sessions. • Office hours held by the instructor to provide further assistance to students. <p>Use of the Blackboard Learning platform, where instructors post lecture notes, assignment instructions, timely announcements, as well as additional resources</p>	
ASSESSMENT:	Summative:	
	Project (development of a functional video game using a game engine)	100
	Formative:	
	In-class exercises	0
The formative aims to prepare students for the summative		

	<p>assessment.</p> <p>The project tests Learning Outcomes 1-3</p> <p>Assignment instructions and assessment rubrics are distributed on the first day of class with the Course Outline</p>
INDICATIVE READING:	<p>REQUIRED READING:</p> <p>Instructor notes and online material</p> <p>RECOMMENDED READING:</p> <p>Hill-Whittall, R. (2015). <i>The Indie Game Developer Handbook</i>. Focal Press</p> <p>Nystrom, R. (2014). <i>Game Programming Patterns</i>.</p> <p>Vaughan, W. (2012). <i>Digital Modelling</i>, New Riders</p> <p>Millington, I. & Funge, J. (2009). <i>Artificial Intelligence for Games</i>. CRC Press</p> <p>Tristem, B. & Geig, M. (2016). <i>Sams Teach Yourself Unity Game Development in 24 Hours</i> (2nd edition). Indianapolis, ID: Sams</p> <p>Linowes, J. (2015). <i>Unity Virtual Reality Projects: Explore the World of Virtual Reality by Building Immersive and Fun VR Projects Using Unity 3D</i>. Birmingham: Packt Publishing.</p> <p>Gerasimov, V. (2015) <i>Building Levels in Unity</i>. Birmingham: Packt Publishing.</p> <p>Cookson, A., DowlingSoka, R., Crumpler, C. (2016). <i>Sams Teach Yourself Unreal Engine 4 Game Development in 24 Hours</i>. Sams Publishing.</p> <p>Shannon, T. (2017). <i>Unreal Engine 4 for Design Visualization: Developing Stunning Interactive Visualizations, Animations, and Renderings</i>. Addison-Wesley.</p> <p>McCaffrey, M. (2017). <i>Unreal Engine VR Cookbook</i>. Addison-Wesley.</p> <p>Gregory, J. (2014). <i>Game Engine Architecture</i> (2nd edition). CRC Press.</p>
INDICATIVE MATERIAL: (e.g. audiovisual, digital material, etc.)	<p>REQUIRED MATERIAL:</p> <p>RECOMMENDED MATERIAL:</p>
COMMUNICATION REQUIREMENTS:	<p>Access to the course's site on the College's Blackboard CMS.</p> <p>Use of word processing and/or presentation graphics software for documentation of assignments</p>
SOFTWARE REQUIREMENTS:	<p>A set of game engines (Unity, Unreal, CryEngine) – latest version</p> <p>3D modelling software (3DS Max, Blender) – latest version</p> <p>Adobe Creative Cloud Suite – latest version</p>

WWW RESOURCES:	http://unity3d.com http://www.3dbuzz.com/training/view/unity-fundamentals http://stackoverflow.com/
INDICATIVE CONTENT:	<ol style="list-style-type: none"> 1. Overview <ol style="list-style-type: none"> 1.1. Overview of the overall development process and workflow 1.2. Overview of interface and functionality 2. 3D graphics concepts 3. Handling content <ol style="list-style-type: none"> 3.1. Primitive objects 3.2. Importing multimedia content 3.3. Combining and utilizing content <ol style="list-style-type: none"> 3.3.1. Assigning components 3.3.2. Importing and exporting packages 4. Introduction to programming concepts <ol style="list-style-type: none"> 4.1. Creating and editing scripts 4.2. Comparison of programming languages 5. Programming: variables and functions 6. Programming: control statements 7. Object-oriented programming 8. 3D game objects <ol style="list-style-type: none"> 8.1. Geometry (3d models) 8.2. Materials and textures 8.3. Lights 9. Animations <ol style="list-style-type: none"> 9.1. Importing animations created externally (e.g. in 3DS Max or Blender) <ol style="list-style-type: none"> 9.1.1. Keyframe animation 9.1.2. Morphing (vertex-based animation) 9.1.3. Making 3DS Max modifiers ready for animation 9.2. Creating animations in the engine 10. Using audio and video 11. Building projects <ol style="list-style-type: none"> 11.1. Cross-platform design: desktop vs. mobile 12. Virtual Reality <ol style="list-style-type: none"> 12.1. Oculus Rift / HTC Vive 12.2. Microsoft Kinect 12.3. Sensor data 12.4. Setting up custom camera rigs (e.g. dome projection)