



COURSE SPECIFICATION			
<b>NAME OF COURSE:</b> Real Time Graphics and Game Development		<b>COURSE CODE:</b>	
<b>STATUS:</b> optional	<b>LEVEL: (F,A,P,1,2,3,M)</b> M	<b>UNIT VALUE:</b> 7 ECTS	<b>TERMS TAUGHT:</b> 2 <sup>nd</sup> term
<b>Department offering course:</b> Computer Science	<b>Course Co-ordinator:</b> Silvester Czanner Diego Gutierrez Jasminka Hasic	<b>Date of course commencement:</b> September 2008.	
<b>Degree Programmes in which to be offered:</b> Computer Graphics for the Media Industry			
<b>Pre-requisites:</b> Optional course	<b>Indicate whether a new course or name of course being replaced:</b> new	<b>Total Contact Hours: 40</b> Lectures: 11 Tutorials: 14 Practical Exercises: 15	
<b>AIMS OF THE COURSE:</b> This course aims to provide the student with a deep understanding of the modern programmable graphics pipeline, details of current Graphics hardware, the skills necessary to program these devices and how to improve the quality of real-time rendered images,.			

INTENDED LEARNING OUTCOMES
<ol style="list-style-type: none"> <li>1. Theoretical knowledge of the modern programmable graphics pipeline and Graphics Hardware</li> <li>2. Develop algorithms and efficiently program in OpenGL</li> <li>3. Creative use of advanced rasterised rendering techniques, including shading.</li> <li>4. Working collectively to develop a real-time game</li> </ol>



LEARNING AND TEACHING STRATEGIES TO BE USED:
<ol style="list-style-type: none"> <li>1. Lectures to illustrate the concepts</li> <li>2, 3. Tutorials and exercises</li> <li>4. Lectures to illustrate the concepts. Group self study</li> </ol>



ASSESSMENT CRITERIA (SHOULD LINK EXPLICITLY TO INTENDED LEARNING OUTCOMES):
<ol style="list-style-type: none"> <li>1. Practical exercises 30%</li> <li>2.3. Results from tutorials 20%</li> <li>4. Group project 50%</li> </ol>

TRANSFERABLE SKILLS AND OTHER ATTRIBUTES
<ol style="list-style-type: none"> <li>1. Ability to design efficient individual graphics programs</li> <li>2. Creativity of environments</li> <li>3. Ability to work together in a team to create a complex project</li> </ol>



LEARNING AND TEACHING STRATEGIES USED:
<ol style="list-style-type: none"> <li>1. Individual practical work</li> <li>2. Lectures and tutorials</li> <li>3. Project and time management advice</li> </ol>



ASSESSMENT CRITERIA (SHOULD LINK EXPLICITLY TO INTENDED LEARNING OUTCOMES):
<ol style="list-style-type: none"> <li>1. Practical exercises</li> <li>2. Practical exercises</li> <li>3. Project presentation including group and individual project mark.</li> </ol>

**COURSE OUTLINE/SYLLABUS:**

- Rasterisation: algorithms for taking a 3D scene, described as polygons or triangles, and rendering it rapidly onto a 2D display; transformations, clipping, scan conversion, acceleration techniques, graphics pipeline.
- Textures: making the scenes look more real; environment mapping, bump mapping, multiresolution textures
- Advanced techniques: Level of Detail, shadow mapping
- Hardware acceleration: GPU programming, OpenGL

**KEY TEXTS AND/OR OTHER LEARNING MATERIALS:**

Recommended Textbooks:

Hubert Nguyen, "GPU Gems 3" Addison-Wesley Professional, 2007.

Randima Fernando, "GPU Gems: Programming Techniques, Tips and Tricks for Real-Time Graphics", Addison-Wesley Professional, 2004.

Matt Pharr, Randima Fernando, "GPU Gems 2: Programming Techniques for High-Performance Graphics and General-Purpose Computation (Gpu Gems)", Addison-Wesley Professional, 2005.