

Óbudai University				
Alba Regia Technical Faculty				
<i>Name of the subject and Neptun code: Software Tools of Game Development</i>				
<i>ECTS: 5</i>				
Faculty:				
Subject leader:	Galina Momcheva PhD., Éva Hajnal PhD.	Teacher:	Gaye Ediboglu Bartos	
Prerequisites				
Weekly hours:	Lecture: 2	gs:0	Lab: 3	Consultation: 0
Way of assessment:	Exam			
Description of the subject:				
<p>Aim: Reality. Collision detection. Deformations. Calculations of forces. The students get acquainted with Unity (XNA) and other development framework, its software basics and they get practice in it. Surface properties, physical attributes. Connection between the physical simulation and visualization. The elements of the graphics pipeline and its operation. Resources, memory handling. Graphics card controlling with OpenGL. Shaders. Animations. Water surface and terrain. Particle systems and nets. HDRI, software simulation of depth of field. Graphics card controlling from the console. Object oriented structure of game motors. PhysX. Case study: game development.</p>				
<i>Curriculum:</i>				
Contents				Hours
Lecture:				
Basic concepts.Game types.				2
Image types, image creation. Main features the object-oriented model of a game engine. Unity, Ogre3D, XNA examples Graphics. Main elements.				2
Coordinates. Coordinate transformations. Homogenous coordinates.				2
Viewing. Types of projections. Perspective. Depth of field and its software simulation.				2
The graphics card, graphics pipeline, DirectX. Resources. Memory handling.				2
Programming of shaders with HLSL. Projection of the movements. Visualization of an environment. Water surface and terrain. Shades. Calculation of physics. Rigid bodies. Collision and collision detection. Particle systems and nets Physical animations				2
Data structures in graphics engines				2
Surface, texture				2
Light effects. Global illumination				2
Ray tracing				2
Animation				
HDRI Case study. FPS game development. Test				2
Practice:				
Game project development with Unity				3
Game framework				3
Moving Objects, Rigidbody				3
Camera and Lighting				3
Materials and Textures				3
Collision and Trigger				3
Unity Assets and Terrain				3
UI Elements				3

UI Elements and PlayerPrefs	3
Basic AI and Effects	3
Test	3
Requirements	
	Finish the game development task of the computer laboratory practice
	Written exam at least 50% achievement
	grades
	50% - 62% 2
	63% - 74% 3
	75% - 85% 4
	86% - 5

References:	
	1. Steve Marschner: Fundamentals of Computer Graphics ISBN: 13:978-1-4822-2941-7
	2. Alan Thorn: Game Development Principles ISBN 10 : 9781285427065 ISBN 13 : 1285427068
	3. Penny de Byl: Holistic Game Development With Unity ISBN 10 : 9781317497233 ISBN 13 : 1317497236