

## MODULE/ COURSE FORM

### A. general information

To be completed by Course Team	Module name : <b>GRAPHICS AND COMPUTER GAMES ENGINES</b>					Module code: M13	
	Course name: <b>Graphics and computer games engines</b>					Course code:	
	Faculty: <b>INSTITUTE OF APPLIED INFORMATICS</b>						
	Field of study: <b>INFORMATICS</b>				Level of education: <b>first</b>		
	Mode of study : <b>Full-time</b>		Learning profile: <b>Practical</b>		Speciality::		
	Year/ semester: <b>2/3</b>		Module/ course status::			Module/ course language: <b>Polish/English</b>	
	Type of classes	lecture	lessons	lab	project	Tutorial	other (please specify)
	Course load	<b>15</b>		<b>30</b>			
	Module/ course objectives		Learning the basic uses of graphic engines, skillful use of the Unreal Engine software environment. Creating your own projects in the form of games as well as real-time visualization. Acquiring the ability to use Virtual Reality in the design of games and architectural visualizations. Professional use of software for 3D graphics, modeling and creating three-dimensional scenery. Use of skills acquired in previous semesters in graphic projects.				
Entry requirements		Good knowledge of 3d software, the ability to model and texturing three-dimensional objects. Basic knowledge of technical drawing and perspective principles.					
<b>LEARNING OUTCOME</b>							
Nr	LEARNING OUTCOME DESCRIPTION					Learning outcome reference	
	<b>Knowledge - student:</b>						
01	has knowledge of general computer science and computer graphics					K_W05	
02	knows the basic methods of modeling, lighting and texturing 3d					K_W15	
03	knows the basic principles of building a computer game					K_W06	
	<b>Skills – student:</b>						
04	supports professional audio video equipment, virtual reality tools					K_U01, K_U06, K_U22	
05	performs a specific project creating computer animations using a graphics engine					K_U20	
06	performs a specific project based on the possibilities of virtual reality					K_U20	
	<b>Social competence – student:</b>						
07	is aware of the need to raise the level of knowledge in the field of computer graphics					K_K01	
08	cooperates in a group using social tools					K_K07	

<b>Assessment method</b>	Learning outcome number	
Solving tasks, tasks related to a specific project topic, analyzing the assumptions and capabilities of the software	04, 05	
Practical project for implementation in project groups, the ability to choose the form of the project, project type, task execution technology	01, 02,03, 04, 05, 06, 07, 08	
Discussion on the feasibility of projects, another approach to known design methods.	06	
<b>STUDENT WORKLOAD</b>		
	Number of hours	
	In all	including practical
Participation in lectures	15	9
Independent study of lecture topics	15	9
Participation in tutorials, labs, projects and seminars	30	30
Independent preparation for tutorials*	30	30
Preparation of projects/essays/etc.*	10	10
Preparation/ independent study for exams		
Participation during consultation hours	2	
Other		
<b>TOTAL student workload in hours</b>	102	88
<b>Number of ECTS credit per course unit</b>	<b>4 ECTS</b>	
Number of ECTS credit associated with practical classes	<b>3,5 ECTS</b>	
Number of ECTS for classes that require direct participation of professors	<b>1,8 ECTS</b>	

## B. details information

To be completed by Course Team	Module name : <b>GRAPHICS AND COMPUTER GAMES ENGINES</b>				Module code: M13		
	Course name: <b>Graphics and computer games engines</b>				Course code:		
	Faculty: <b>Institute of Applied Informatics</b>						
	Field of study: <b>INFORMATICS</b>			Level of education: <b>first</b>			
	Mode of study : <b>Full-time</b>		Learning profile: <b>Practical</b>		Speciality::		
	Year/ semester: <b>2/3</b>		Module/ course status::		Module/ course language: <b>Polish/English</b>		
	Type of classes	lecture	lessons	lab	project	Tutorial	other (please specify)
	Course load	<b>15</b>		<b>30</b>			
	Module/ course coordinator		<b>mgr inż. Wiesław Gerej</b>				
Lecturer		<b>dr inż. Jacek Paluszak, mgr inż. Wiesław Gerej</b>					
<b>CURRICULUM CONTENTS</b>							
<b>Lecture</b>							
<p>a) the use of computer graphics for the purposes of visualization of technological processes in terms of CAD and CAM software</p> <p>b) computer graphics as a information carrier in engineering applications, methods of visualization</p> <p>c) analyzing the possibilities of 3D graphics software for use in the production of a computer game</p> <ol style="list-style-type: none"> <li>1. Overview of basic graphics engines, and comparison of their capabilities depending on the uses</li> <li>2. Analysis of the most popular computer games in terms of the graphics engine used and the software's efficiency</li> <li>3. Comparison of graphics card performance depending on the graphics engine used</li> <li>4. Introduction to virtual reality technology</li> <li>5. Comparison of virtual reality glasses available on the market</li> <li>6. The use of virtual reality for the needs of industry and home use</li> </ol> <p>Including content related to practical professional preparation: [60%]</p>							
<b>Lessons</b>							
<p>Initial classes refer to the previous two semesters in the field of computer graphics. Students prepare models and the environment to be implemented in the Unreal Engine graphics engine. Based on the graphics engine software, students test the engine's capabilities and performance in terms of real-time playback speed and the quality of the visual effects obtained. The next stage of work is to create a relations and interactions between objects, the use physics of solids and elastic objects. The final stage of the laboratory classes is to create a computer game or visualization using virtual reality technology.</p> <p>Including content related to practical professional preparation: [100%]</p>							
<b>Project (other)</b>							

Basic literature	<ol style="list-style-type: none"> <li>1. "Unreal Engine 4 for Design Visualization" Tom Shannon</li> <li>2. "Beginning C++ Through Game Programming" Michael Dawson</li> <li>3. "Getting Started with Unity 2018 - Third Edition" Dr. Edward Lavieri</li> </ol>
Additional literature	
Teaching methods	Lecture with multimedia presentation, laboratory exercises, project presentations and discussion.
Form and terms of an exam	A final project in the form of a game or spatial visualization based on the Unreal Engine 4 graphics engine. Creation of the environment, generation of objects and interaction between them. The possibility of teamwork, depending on the design assumptions and the size of the project. Passing the project implemented in stages, supported by the discussion regarding the completed part of the project. The scope of knowledge given during the lecture is 50 percent. Project implementation for mobile devices.