



COURSE DESCRIPTION

Course code	full-time studies	
	part-time-studies	
Course name	Rzeczywistość wirtualna i rozszerzona	
Course name in English	Virtual and augmented reality	
Valid from academic year	2022/23	

PLACEMENT IN THE TEACHING PROGRAM

Field of study	Computer Science
Level of education	1st degree
Studies profile	General
Form and method of teaching classes	Full-time and part-time studies
Specialization	Computer graphics
Organizational unit responsible for the course	Department of Computer Systems
Course coordinator	Grzegorz Łukawski
Approved by	Dean of the Faculty of Electrical Engineering, Automatic Control and Computer Science Roman Deniziak, KUT prof., DSc, PhD

GENERAL CHARACTERISTIC OF THE COURSE

Course affiliation	Speciality course	
Course status	Mandatory	
Language	English	
Semester	full-time studies	5th
	part-time-studies	6th
Requirements	Basics of the computer graphics 1 & 2, Object-oriented programming 1 & 2	
Exam (YES/NO)	NO	
ECTS	5	

Course form		lecture	classes	laboratory	project	other
Hours per semester	full-time studies	30		30	15	
	part-time-studies	18		18	9	

LEARNING RESULTS

Category	Result Symbol	Learning Results	References to the field of study results
Knowledge	W01	Student knows and understands principles of operation of virtual and augmented reality techniques, their basic assumptions and types of devices intended for their implementation.	INF_W28
	W02	Student knows and understands the basics of application programming for virtual and augmented reality.	INF_W28
Skills	U01	Student is able to use appropriate programming tools for developing applications for virtual and augmented reality.	INF_U28
Social competence	K01	Student is ready to analyse a programming problem, divide it into elements and cooperate in a team during its implementation.	INF_K1 INF_K2

COURSE CONTENT

Course Form	Content
lecture	1. Basic assumptions of virtual and augmented reality, types of programming tools and hardware devices.
	2. Programming interfaces and game engines for developing applications for virtual and augmented reality.
	3. Additional tools and advanced algorithms for virtual and augmented reality.
laboratory	1. Basics of using game engines and interfaces to create applications for virtual and augmented reality.
	2. The use of additional tools and algorithms to perform tasks related to virtual and augmented reality.
project	Preparation of an application using virtual or augmented reality, using selected technologies.

LEARNING RESULTS VERIFICATION METHODS

Result Symbol	Learning results verification methods					
	Oral Exam	Written Exam	Midterm	Project	Report	Other
W01			X			
W02			X			
U01			X			X
K01				X	X	

ASSESSMENT FORMS AND CRITERIA

Course Form	Assessment Form	Assessment Criteria
lecture	Passing grade	The student should obtain at least 50% of points at the final test.
laboratory	Passing grade	The student should obtain at least 50% of points from laboratory classes and the final test, midterms or the final test and midterms.
project	Passing grade	The student should obtain at least 50% of points for the project task and report.

STUDENT'S VOLUME OF WORK

ECTS Balance													
No.	Activity Type	Student Involvement										Unit	
		full-time studies					part-time-studies						
		Lec	C	Lab	P	S	Lec	C	Lab	P	S		
1.	Participation in classes according to the schedule	30		30	15		18		18	9		h	
2.	Other (consultations, exams)	2		2	2		2		2	2		h	
3.	Total with the direct assist of an academic teacher	81					51					h	
4.	Number of ECTS, that students obtains with the direct assist of an academic teacher	3,24					2,04					ECTS	
5.	Hours of unassisted student work	44					74					h	
6.	Number of ECTS that student obtains working unassisted	1,76					2,96					ECTS	
7.	Practical classes volume of work	45					27					h	
8.	Number of ECTS obtained by student at practical classes	1,8					1,08					ECTS	
9.	Total student's volume of work expressed in hours	125					125					h	
10.	ECTS	5											

BIBLIOGRAPHY

1. Dawn Griffiths, David Griffiths: "Head First Android Development. A Brain-Friendly Guide.", O'Reilly Media 2017.
2. Ian F. Darwin: "Android Cookbook. Problems and Solutions for Android Developers.", O'Reilly Media 2017.
3. Open-source, multi-platform augmented reality "artoolkitX": <http://www.artoolkitx.org/>
4. Unity game engine: <https://unity.com/>
5. Android Developers: <https://developer.android.com/>