

Specification for the book of courses

Study program		Computing and Informatics		
Module		Software Engineering		
Type and level of studies		Master studies		
The name of the course		Virtual and Augmented Reality Systems		
Lecturer (for lectures)		Rančić D. Dejan, Milosavljević Lj. Aleksandar		
Lecturer/associate (for exercises)		Dimitrijević M. Aleksandar		
Lecturer/associate (for OFE)				
Number of ECTS	4	Course status (obligatory/elective)	Elective	
Prerequisites				
Course objectives	Introduce students to the field of virtual and augmented reality and getting acquainted with basic devices, algorithms, and techniques used in the realization of these systems.			
Course outcomes	Getting to know basic principles, devices, techniques, and algorithms used in the realization of the virtual and augmented reality system.			
Course outline				
Theoretical teaching	Introduction to the field of virtual and augmented and historical context. System architecture for virtual reality. Input and Output Devices for Virtual Reality. Gesture and haptic interface. Geometric modeling of virtual objects. Kinematic and physical modeling. Virtual worlds. Positioning the augmented reality in the continuum between the real world and the virtual reality. Classification of the augmented reality system. Techniques for estimating the viewer's pose in the augmented reality system. Augmented virtual environments. Application domains and examples of the virtual and augmented reality system.			
Practical teaching (exercises, OFE, study and research)	Practical work on programming the elements of virtual and augmented reality using Unity development environment and Google Cardboard, Vuforia, and ARCore libraries.			
Textbooks/references				
1	K. Stanney, Handbook of Virtual Environments: Design, Implementation, and Applications, Lawrence Erlbaum Associates, 2002.			
2	G. Burdea, P. Coiffet, Virtual Reality Technology, Wiley-IEEE, 2003.			
3	O. Bimber, R. Raskar, Spatial Augmented Reality: Merging Real and Virtual Worlds, A K Peters, 2005.			
4	T. Mullen, Prototyping Augmented Reality, John Wiley & Sons, 2011.			
5				
Number of classes of active education per week during semester/trimester/year				
Lectures	Exercises	OFE	Study and research work	Other classes
2	1	0		
Teaching methods	Lectures, auditory exercises, independent student work on a project.			
Grade (maximum number of points 100)				
Pre-exam duties	Points	Final exam	Points	
Activity during lectures		Written exam		
Exercises	30	Oral exam	40	
Colloquia				
Projects	30			