COURSE DESCRIPTION CARD - SYLLABUS

Course name
Virtual and Augmented Reality 2

Course

Field of study
Product Lifecycle Engineering
Area of study (specialization)

Level of study
Second-cycle studies
Form of study
full-time

Year/Semester
1/2
Profile of study
general academic
Course offered in
English
Requirements
elective

Number of hours

Lecture	Laboratory classes	Other (e.g. online)
Tutorials	Projects/seminars	
	30	

Number of credit points
2

Lecturers

Responsible for the course/lecturer:
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Faculty of Mechanical Engineering

Piotrowo Street No 3, 60-965 Poznań

Responsible for the course/lecturer:

Prerequisites

1. Knowledge

The students have knowledge of basic IT, computer graphics and CAD. They are familiar with the notions of design and prototyping, as well as project management methodologies. They know basic applications of VR in product lifecycle.

2. Skills

The students can build a solid 3D model of a part and an assembly in a CAD 3D system of their choice. They are able to build a simple VR application in Unity 3D software.

3. Social competences

The students are open to implementation of modern computer technologies in production process. They are able develop their knowledge and skills in a topic on their own. They can communicate in a project team and realize projects.

Course objective

Obtaining skills of creating applications working with VR, AR and MR specialized hardware.

Course-related learning outcomes

Knowledge

1. Has knowledge on methodology of design and implementation of VR/AR/MR.

2. Has knowledge on teamwork in a team realizing build of an engineering VR/AR/MR application.

Skills

1. Is able to develop 2D and 3D data for the needs of VR/AR/MR applications, with particular consideration of available visualization techniques.

2. Is able to design an interactive VR/AR/MR application using selected hardware.

Social competences

1. Is aware of consequences of use of modern IT systems in public life.

2. Is open for application of VR in process of design of a new product.

3. Can properly present pros and cons of use of VR/AR/MR in engineering activities.

Methods for verifying learning outcomes and assessment criteria

Learning outcomes presented above are verified as follows:

Formulating grade:

Project: on the basis of current advancement in realization of project tasks

Final grade:

Project: on the basis of assessment of two VR/AR/MR applications developed by a given project team and presented using laboratory equipment.

Programme content

1. Assembling project teams, assigning roles, selection of topics.

2.Building simple engineering application in immersive VR: visualization, interaction, interface; implementation on VR goggles (HTC Vive / Oculus Rift), use of controllers, possibly sensors/gloves.

3. Building simple engineering application in AR/MR: visualization, interaction, interface; implementation on AR glasses (Epson, Vuzix) or MR goggles (HoloLens), possibly on a mobile device (Android tablet).

Teaching methods

- case study

- project method

Bibliography

Basic

1. B. Arnaldi, P. Guitton, G. Moreau,Virtual Reality and Augmented Reality: Myths and Realities, Wiley, 2018

Additional

Breakdown of average student's workload

	Hours	ECTS
Total workload	50	2,0
Classes requiring direct contact with the teacher	30	1,0
Student's own work (literature studies, preparation for laboratory classes/tutorials, preparation for tests/exam, project preparation) [1]	20	1,0

1 delete or add other activities as appropriate