Short Name of the University/Country code Date (Month / Year)	DSEA/ P11 September 2020
TITLE OF THE MODULE	Code
Virtual and Added Reality Technologies	**2.2.6**

Teacher(s)	Department
Coordinating: Ph.D. Mikhieienko D.Y. **Others:**	Department of Computer and Information Technology (CIT)

Study cycle	Level of the module	Type of the module
MA	2th semester	selective

Form of delivery	Duration	Language (s)
Lectures, seminars	15 weeks	Ukrainian/English

Prerequisites	
Prerequisites: studying the disciplines "Algorithmization and programming ", "Computer Graphics", " Object-oriented programming "	**Co-requisites (if necessary):**

ECTS (Credits of the module)	Total student workload hours	Contact hours	Individual work hours
5,5	120	54	66

Aim of the module (course unit): competences foreseen by the study programmes
Students should be able to: -   Develop and implement software using virtual and augmented reality technologies, use virtual and augmented reality tools to solve medical problems

Learning outcomes of module (course unit)	Teaching/learning methods	Assessment methods
Knowledge: – getting acquainted with the principles, methods, algorithms of virtual and augmented reality; – introduction to virtual and augmented reality systems.	Lectures	Test
Skills: – formation of theoretical knowledge and practical skills for working with virtual and augmented reality; – developing the ability to develop virtual and augmented reality applications, in particular for medical purposes.	Seminar	Presentation

Themes	Contact work hours							Time and tasks for individual work	
	Lectures	Consultations	Seminars	Practicalwork	Laboratory work	Placements	Total contact work	Individual work	Tasks
1 Basic concepts, principles and tools for the development of VR and AR systems, as well as equipment for the implementation of VR and AR.	4				4		8	10	Study of theoretical material, case study
2. The difference between AR, Virtual Reality (VR) and Mixed Reality. Equipment. Leading companies developing VR / AR projects	4				4		8	10	Study of theoretical material, case study
3. Virtual and augmented reality as a tool of psychotherapy. Virtual reality for the diagnosis of neurological diseases. Additional and virtual reality for brain stimulation. Augmented reality in medical education	4				4		8	10	Study of theoretical material, case study
4. Stages and technologies of VR systems creation, structure and components.	4				4		8	10	Study of theoretical material /case study/ presentations
5. Review of modern 3D engines. Basic concepts, possibilities, conditions of use. Comparative analysis.	4				4		8	10	Study of theoretical material/case study/ presentations
6. Basics of working with SDK Unity 3D. Create a VR application using the Unity SDK. Sensors, manipulators, gesture recognition devices.	4				4		8	10	Study of theoretical material /case study/ presentations
7. Augmented reality application architecture. Scopes of augmented reality	4				4		8	11	Study of theoretical material /case study/ presentations
8. Limitations of augmented reality technology. Overview of augmented reality application development tools	4				4		8	11	Study of theoretical material /case study/ presentations
9. Platforms for AR application development. Stages of development: selection of the environment taking into account features (mobile application, industrial or corporate context),	4				4		8	11	Study of theoretical material /case study/ presentations

choice of tools, design development, coding (display, interaction, support), testing								
Total	36				36		72	93

Assessment strategy	Weight in %	Deadlines	Assessment criteria
Presentation	40	15thweek	Attendance, activity, presentation
Final test	60	15thweek	Open questions test

Author	Year of issue	Title	No of periodical or volume	Place of printing. Printing house or internet link
Compulsory literature				
Stephanie Lackey, Jessie Chen	2017	Virtual, Augmented and Mixed Reality		Springer
Terry M. Peters, Cristian A. Linte, Ziv Yaniv, Jacqueline Williams	2018	Mixed and Augmented Reality in Medicine		CRC Press
Additional literature				
Тимур Машнин	2018	Разработка Android-приложений с Augmented Reality		Litres

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