

1. GENERAL

SCHOOL	ENGINEERING		
DEPARTMENT	PRODUCT AND SYSTEMS DESIGN ENGINEERING		
LEVEL OF STUDIES	UNDERGRADUATE		
COURSE CODE	4101	SEMESTER	7th
COURSE TITLE	ADVANCED INTERACTION TECHNOLOGIES AND APPLICATIONS		
INDEPENDENT TEACHING ACTIVITIES <i>if credits are awarded for separate components of the course, e.g. lectures, laboratory exercises, etc. If the credits are awarded for the whole of the course, give the weekly teaching hours and the total credits</i>	WEEKLY TEACHING HOURS	CREDITS	
Lectures	3	6	
Laboratory			
<i>Add rows if necessary. The organisation of teaching and the teaching methods used are described in detail at (d).</i>			
COURSE TYPE <i>general background, special background, specialised general knowledge, skills development</i>	<i>specialised general knowledge</i>		
PREREQUISITE COURSES:			
LANGUAGE OF INSTRUCTION and EXAMINATIONS:	GREEK/ENGLISH		
COURSE DELIVERED TO ERASMUS STUDENTS	YES		
MODULE WEB PAGE (URL)	https://eclass.uowm.gr/courses/MRE259		

2. LEARNING OUTCOMES

Learning outcomes
<p>Human-computer interaction has gone through many stages. Starting with the keyboard and reaching the modern forms of interfaces, the tendency is to use more and more human ways of communication (voice, gaze, movement, gestures, etc.) especially in new application environments and ubiquitous computing. The aim of the course is to present the basic principles in terms of user requirements, design, modeling and evaluation of advanced and physical user interfaces.</p> <p>The interfaces that are presented are:</p> <ul style="list-style-type: none"> • Kinesthetic / gestural user interfaces • Multitouch interfaces for large screens and tabletops, • Gaze interaction, • Voice user interfaces, • Brain-computer interfaces <p>Upon successful completion of the course, the student should be able to:</p>

- Describe the various modes of physical human-computer interaction (brain-computer interfaces, voice, eye-based, haptic, multitouch and kinesthetic)
- Explain the basic issues and operating principles of these forms of interaction
- Describe the interaction techniques based on these systems.
- Design advanced interaction prototypes.

General Skills

Background in advanced human-computer interaction technologies

3. COURSE CONTENTS

- Introduction to physical interaction
- Kinesthetic interaction
- Gaze Interaction
- Haptic interaction
- Vocal Interaction
- Brain Computer interfaces

4. TEACHING METHODS - ASSESSMENT

MODE OF DELIVERY	THEORY In class, face to face											
USE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY	<ul style="list-style-type: none"> • Use of appropriate software • Video and slide presentations • Support of teaching process via the e-class electronic platform. 											
TEACHING METHODS	<table border="1"> <thead> <tr> <th><i>Activity</i></th> <th><i>Semester workload</i></th> </tr> </thead> <tbody> <tr> <td>Lectures</td> <td>50</td> </tr> <tr> <td>Projects</td> <td>50</td> </tr> <tr> <td>Non-directed study</td> <td>50</td> </tr> <tr> <td>Course total</td> <td>150</td> </tr> </tbody> </table>		<i>Activity</i>	<i>Semester workload</i>	Lectures	50	Projects	50	Non-directed study	50	Course total	150
<i>Activity</i>	<i>Semester workload</i>											
Lectures	50											
Projects	50											
Non-directed study	50											
Course total	150											
ASSESSMENT METHODS	<ol style="list-style-type: none"> 1. (60%) Final written exam which includes: <ol style="list-style-type: none"> i. Short-answer questions ii. Multiple choice questions iii. Problem solving 2. (40%) Homework 											

5. ATTACHED

- *Suggested bibliography:*

- **Cohen, M. H. (2004). Voice user interface design. J. P. Giangola, & J. Balogh (Eds.). Addison-Wesley Professional.**
- **Dasgupta, R (2018). Voice User Interface Design: Moving from GUI to Mixed Modal Interaction**
- **Kortum, P. (2008) HCI Beyond the GUI, Elsevier.**
- **Nielsen, J., & Pernice, K. (2010). Eyetracking web usability. New Riders.**
- **Shaffer, D. (2009) Designing Gestural Interfaces, 'Reilly.**
- **Wigdor, D., & Wixon, D. (2011). Brave NUI world: designing natural user interfaces for touch and gesture. Elsevier.**
- **Clément, C. (2019), "Brain-Computer Interface Technologies: Accelerating Neuro-Technology for Human Benefit, Springer**

The course material is selected topics from the above books and corresponding scientific journals in the form of Notes.