Course Unit	Interaction Technologies			Field of study	Computer Science		
Bachelor in	Multimedia			School	School of Public Management, Communication and Tourism		
Academic Year	2022/2023	Year of study	2	Level	1-2	ECTS credits	6.0
Type	Semestral	Semester	2	Code	9213-656-2205-00-22		

Workload (hours)	162	Contact hours	T	-	TP	60	PL	-	TC	-	S	-	E	-	OT	-	O	-

T - Lectures; TP - Lectures and problem-solving; PL - Problem-solving, project or laboratory; TC - Fieldwork; S - Seminar; E - Placement; OT - Tutorial; O - Other

Name(s) of lecturer(s)	Arlindo Costa dos Santos

Learning outcomes and competences

At the end of the course unit the learner is expected to be able to:
1. Know the different types of man-machine and machine-machine interaction in physical environments, digital environments and virtual worlds.
2. Explore the fields of mobile interaction, multimodal interaction, virtual reality, augmented and mixed, and physical interaction
3. Develop project with computational methods for processing different forms of human and machine interaction, and produce answers in the context of multimedia to real-time variables
4. Possess practical skills in the use of develop tools low code

Prerequisites

Before the course unit the learner is expected to be able to:
Knowledge of programming languages

Course contents

1. Inputs and outputs of interaction 2. Interaction information 3. Physical computing 4. Augmented Reality, Virtual Reality and Mixed Reality 5. Frameworks and microcontrollers

Course contents (extended version)

1. Inputs and outputs of interaction
    - Traditional
    - Voice
    - Touch and Multitouch
    - Video
    - Image
    - Sound
    - Human Control Interfaces
    - Microcontrollers
2. Interaction information
    - Movement and location
    - Human gestures
    - Human vs machine
    - Human vision and hearing
3. Human vision and hearing
    - Concept
    - Interaction between and with the physical environment
    - Ubiquitous computing
    - Intelligent environment
    - Mobile Computing
    - Internet of Things
4. Augmented Reality, Virtual Reality and Mixed Reality
    - Concepts
    - Technologies
5. Frameworks and microcontrollers

Recommended reading

1. Jerald, J. (2015). The VR Book: Human-Centered Design for Virtual Reality Acm Books. ISBN: 9781970001129
2. Stern, N, (2013). Interactive Art and Embodiment: The Implicit Body as Performance. Gylphi Limited. ISBN: 9781780240091
3. Margolis, M. (2017). Arduino Cookbook. O'Reilly Media. ISBN: 9781449313876
4. Filimowicz, M. e Tzankova, V. (2018). New Directions in Third Wave Human-Computer Interaction: Volume 1 - Technologies. Springer International Publishing. ISBN: 9783319733555.
5. Noble, J. (2012)Programming Interactivity: A Designer's Guide to Processing, Arduino, and openFrameworks. O'Reilly Media; Second edition. ISBN: 9781449311445

Teaching and learning methods

Contact hours: Explanation of concepts, conducting practical exercises to apply the concepts. Non-contact hours: Exercises, research work.

Assessment methods

1. Distributed evaluation - (Regular, Student Worker) (Final, Supplementary, Special)
    - Practical Work - 75% (Pratical works to apply the knowledge learned during the semester.)
    - Final Written Exam - 25% (Evaluation of concepts. Minimum grade 8 values.)
2. Exchange students - (Regular, Student Worker) (Final, Supplementary, Special)
    - Practical Work - 100% (Pratical works to apply the knowledge learned during the semester.)

Language of instruction

Portuguese, with additional English support for foreign students.

Electronic validation

Arlindo Costa dos Santos	Ana Lucia Jesus Pinto	Elisabete da Anunciacao Paulo Morais	Luisa Margarida Barata Lopes
26-02-2023	12-03-2023	13-03-2023	14-03-2023