INSTITUTO POLITÉCNICO DE BRAGANÇA

Course Unit	Advanced Interaction Systems			Field of study	Information Systems		
Master in	Informatics			School	School of Technology and Management		
Academic Year	2025/2026	Year of study	1	Level	2-1	ECTS credits	6.0
Type	Semestral	Semester	1	Code	5060-858-1104-00-25		

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): Paulo Alexandre Vara Alves

Learning outcomes and competences

At the end of the course unit the learner is expected to be able to:
1. Understand the fundamental role that interaction processes between the user and the machine play in the success of computer applications
2. Apply research techniques to conceive and design interactive systems and services
3. Develop more suitable prototypes to validate and identify interaction problems
4. Apply the main information visualization techniques
5. Create advanced user interfaces from a behavioral perspective

Prerequisites

Before the course unit the learner is expected to be able to:
1. Carry out requirements gathering for a computer application
2. Develop a web application using a programming language

Course contents

Fundamentals of Interaction Design. Usability and User Experience (UX) Principles. Human and Technological Factors. User-Centered Design and Iterative Processes. Advanced Graphic Design Principles. Information Visualization. Prototype Development. Interaction Design and User Experience project development.

Course contents (extended version)

1. Fundamentals of Interaction Design
   - Usability and User Experience (UX) Principles
   - Human and Technological Factors
   - User-Centered Design and Iterative Processes
   - Task Analysis and User Profiles
   - Interface Evaluation Methods
2. Traditional and Emerging Interaction Styles and Paradigms
   - Windows
   - Voice
   - Touch
   - Gestures
   - Computer vision
   - AR/VR
   - BCIs
   - EyeTracking
3. Advanced Interaction Design Project
   - Graphic Design
   - Information Visualization
   - Sketching and Prototyping
   - Interaction Design and User Experience Project

Recommended reading

1. B. Buxton, “Sketching User Experiences”, Morgan Kaufmann, 2007.
2. D. Norman, “The Design of Everyday Things”, MIT Press, 2013.
3. B. Shneiderman, “Designing the User Interface: Strategies for Effective Human-Computer Interaction”, Pearson, 2009.
4. Y. Rogers, H. Sharp, and J. Preece, "Interaction Design", 6th ed., Wiley, 2023.
5. D. Orlova, E. Kadah, J. Blasco, "Flutter Design Patterns and Best Practices", Packt Publishing, 2024.

Teaching and learning methods

A project-based pedagogical methodology (PBL), with the initial definition of a problem, and the teacher will support the students in all the phases of the project development in order to maintain the motivation and help to frame the work of the students in the goals of the curricular unit.

Assessment methods

1. Alternative A - (Regular, Student Worker) (Final, Supplementary, Special)
   - Practical Work - 30% (Continuous assessment through practical work performed during classes)
   - Projects - 70% (Project)
2. Alternative B - (Student Worker) (Final, Supplementary, Special)
   - Projects - 100% (Project)

Language of instruction

English

Electronic validation

Paulo Alexandre Vara Alves	Tiago Miguel Ferreira Guimaraes Pedrosa	José Eduardo Moreira Fernandes	José Carlos Rufino Amaro
15-10-2025	17-10-2025	24-10-2025	01-11-2025