

DEGREE IN INDUSTRIAL DESIGN ENGINEERING

SUBJECT TEACHING PLAN TECHNOLOGY AND INTERACTION

ACADEMIC YEAR: 2025-26
YEAR: 2nd
NATURE: Compulsory
TERM: 4
ECTS credits: 6
CLASSROOM HOURS: 49
INDEPENDENT WORK HOURS: 101
TOTAL HOURS: 150
LANGUAGE/S: English
CODE: 17042

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PRESENTATION OF SUBJECT/OBJECTIVES

This course explores the intersection of immersive technologies and user experience design, while building up programming skills and computational thinking abilities. Students will learn to develop virtual environments and interactive systems through research-driven, user-centered design methodologies. Covering a complete product lifecycle from concept to deployment, the course addresses human-computer interaction principles, communication protocols, and system architecture. Students will apply UX research techniques to create inclusive designs that consider diverse cultural, social, economic, ethical, and gender perspectives, with all projects grounded in rigorous scientific research.

SUSTAINABLE DEVELOPMENT GOALS (SDGS)

This subject does not specifically incorporate any SDG.

CONTENT

Block-I: Unity & Interaction

Introduction to Unity and C#
Interactions and Events
Designing and Prototyping an Interactive App

Block-II: Virtual Reality & Research

Introduction to Unity VR and Media-Pipe
Introduction to Research Methodologies
Introduction to Full-Body Interactions
Virtual Reality Environments
Designing and Prototyping an App for VR/Media-Pipe

Block-III: Arduino & Communication

Serial Communication with Arduino
Arduino for Textiles
Designing and Prototyping a Wearable

TEACHING METHODS

- Work sessions with the entire class group and teacher. (PA)

COMPETENCIES

- G1 - Develop a creative attitude of experimentation based on scientific and humanistic criteria that favours the exploration of relevant and innovative contributions.
- G2 - Configure new realities to interpret historical, social, cultural, economic and technological contexts.
- CB3 - Students must have the ability to compile and interpret relevant data (normally within their study area) to produce opinions that include a reflection on relevant topics of a social, scientific or ethical nature.
- CB5 - Students must have developed the learning skills required to undertake subsequent studies with a high degree of autonomy

- T1 - Act with a critical spirit to reflect on knowledge in all its dimensions, demonstrating intellectual, cultural and scientific restlessness and a commitment to rigour and quality in professional standards.
- T4 - Demonstrate skills for professional exercise in complex multidisciplinary environments in coordination with networked work teams, whether in-person or virtually, by making computer-based and informational use of ICTs.
- E3 - Harness IT and programming for application across the different phases of industrial design engineering.
- E8 - Resolve technical problems in a creative way in industrial design engineering settings to respond to new situations.
- E9 - Recognise scientific methods to onboard research sources in decision-making.

LEARNING OUTCOMES

- Compile and interpret data and disclosures on which to base conclusions, including reflections on social, scientific and ethical matters in the field of ICTs.
- Identify their own training requirements and organise their own learning with a high degree of autonomy across all types of contexts (structured or otherwise).
- Show critical reflection skills in processes related to exercising the profession.
- Develop the general use of ICTs correctly and particularly in the technological environments inherent to the professional sphere.
- Apply data in different phases of industrial design engineering.
- Take a creative approach to solving technical problems in new industrial design situations.
- Onboard research sources in decision-making.

TRAINING ACTIVITIES

Each subject will involve a presentation of the WORK PLAN at the start of the year, showing the learning activities by week / session / independent work.

ASSESSMENT

ASSESSMENT SYSTEMS

Subject assessment will be based on ongoing monitoring of the student's academic work throughout the year.

ASSESSMENT SYSTEM	FINAL WEIGHTING
P2-Monitoring performed work	15
P4-Specific assessment tests: exams	35
P5-Performance of requisite work and projects	50

ASSESSMENT CRITERIA

The final grade for the subject will be the weighted average of the grades of the assessable activities according to the following table

ASSESSABLE ACTIVITY	WEIGHT	RECOVERABLE (up to 50%)	ASSESSMENT SYSTEM
Activity-1 Exercises and Participation in Class	15%	NO	P-2
Activity-2 1st Project	10%	NO	P-5
Activity-3 2nd Project ***	40%	NO	P-5
Activity-4 Exams	35%	YES*	P-4**

Students will have the option of re-examining themselves for recoverable tests. The recovery tests will be carried out in the period of the semester destined to this function, not being able to recover more than 50% of the subject.

* In the event that the Recoverable Evaluable Activities exceed 50%, the student may choose, up to a limit of 50%.

** In order to calculate the final grade for the course, it will be necessary to obtain a minimum grade of 4 in the weighted average of the exams (evaluation system P-4).

***All shared material and borrowed components must be returned in good condition at the end of the course. Failing to do so will result in disciplinary action.

The unjustified non-presentation of any evaluable activity implies a grade of 0, even if the activity has been qualified as Recoverable.

The Recoverable Activities can only be subject to recovery when they have been delivered by the student on the indicated date and with a grade equal to or greater than 3.

If you renounce access to the recovery test, the grade achieved in the first instance will be maintained.

In case of presenting to recovery, the note obtained will be the last, even if it is less than the first.

Plagiarism or copying someone else's work is penalized in all universities and, according to the Rules of Coexistence of the University of Vic-Central University of Catalonia, they constitute serious or very serious offenses. That is why during the course of this subject any indication of plagiarism or misappropriation of other people's texts or ideas ([What is considered plagiarism?](#)) as well as the improper or undeclared use of Artificial Intelligence in an activity, will result automatically in failure of the subject and/or other disciplinary measures ([Norms of Coexistence of the University of Vic-Central University of Catalonia](#)). For any questions or queries, see the ([Academic Regulations for the Degree of the Elisava Faculty of Design and Engineering UVic-UCC](#)).

BIBLIOGRAPHY AND TEACHING RESOURCES

Arduino

- Artero, Ó. T. 2013. *Arduino: curso práctico de formación*. RC Libros.
- Banzi, M., Shilo, M. 2012. *Introducción a arduino: La revolución del hardware libre en el diseño industrial y el arte interactivo*. Anaya Multimedia.
- Lequerica, J. R. 2013. *Manual imprescindible de Arduino práctico*. Anaya Multimedia.
- Hartman, K. 2014. *Make: Wearable Electronics: Design, prototype, and wear your own interactive garments*. Maker Media, Inc..
- <https://create.arduino.cc/projecthub>
- <https://www.arduino.cc/en/Tutorial/BuiltInExamples>

Unity

- Ariel, G. 2017. *Augmenting Alice: The Future of Identity, Experience and Reality*. BIS publishers.
- Kipper, G., & Rampolla, J. 2012. *Augmented Reality: an emerging technologies guide to AR*. Elsevier.
- MacLeod, M. A. M. D., & McLeod, D. B. 1996. *Immersed in technology: art and virtual environments*. mit Press

Complementary readings, About Programming

- Aho, A. V., Hopcroft, J. E., & Ullman, J. D. 1988. *Estructuras de datos y algoritmos* (Vol. 1). Addison-Wesley Iberoamericana.
- Greenberg, I. 2007. *Processing: Creative Coding and Computational Art* (Foundation). Friends of ED.
- Wirth, N. 1980. *Algoritmos + estructuras de datos = programas* (Vol. 7). Ediciones del Castillo.
- Preece, J., Rogers, Y., & Sharp, H. 2015. *Interaction design: beyond human-computer interaction*. John Wiley & Sons