DEGREE IN INDUSTRIAL DESIGN ENGINEERING

SYLLABUS
TECHNOLOGY AND INTERACTION

ACADEMIC YEAR: 2026-27
YEAR: 2nd
NATURE: Compulsory
SEMESTRE: 2nd
ECTS: 6
CLASSROOM HOURS: 49
HOURS OF AUTONOMOUS WORK: 101
TOTAL HOURS: 150
LANGUAGE/S: English
CODE: 17042

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PRESENTATION OF SUBJECT/GOALS

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-centred 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

- Developing a creative attitude of experimentation, under scientific and humanistic criteria, which favours the exploration of relevant and innovative contributions. (G1)
- Configuring new realities based on the interpretation of the historical, social, cultural, economic and technological context. (G2)
- Students must have the ability to gather and interpret relevant data (usually within their area of study) to make judgments that include reflection on relevant social, scientific or ethical issues. (CB3)
- Students must have developed those learning skills necessary to undertake further studies with a high degree of autonomy. (CB5)
- Acting with a spirit and critical reflection in the face of knowledge in all its dimensions, showing intellectual, cultural and scientific concern and commitment to rigour and quality in professional demand. (T1)
- Showing skills for professional practice in multidisciplinary and complex environments, in coordination with networking teams, either in face-to-face or virtual environments, through the computer and informational use of ICTs. (T4)
- Using computer science and programming for application in different phases of industrial design engineering. (E3)
- Solving technical problems creatively in the fields of Industrial Design Engineering to respond to new situations. (E8)
- Recognising scientific methods to integrate research sources into decision-making. (E9)

LEARNING OUTCOMES

- Compiling and interpreting data, and disclosing on which to base conclusions, including reflections on social, scientific and ethical matters in the field of ICTs.
- Identifying their own training requirements, and organising their own learning with a high degree of autonomy across all types of contexts (structured or otherwise).
- Showing critical reflection skills in processes related to exercising the profession.
- Developing the general use of ICTs correctly and particularly in the technological environments inherent to the professional sphere.
- Applying data in different phases of industrial design engineering.
- Taking 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.

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EXAMINATION

EXAMINATION SYSTEMS

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

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

EXAMINATION CRITERIA

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

EXAMINATION 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 retaking the retake tests. The retake tests will be carried out in the period of the semester allocated to this function, not being able to recover more than 50% of the subject.

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

The unjustified non-submission of any assessable activity implies a grade of 0, even if the activity has been classified as Recoverable.

Recoverable Activities can only be recovered when they have been submitted by the student body on the indicated date and with a grade equal to or greater than 3.

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

If access to the retake test is waived, the grade achieved in the first instance will be maintained.

In case of taking the recovery, the grade obtained will be the last, even if it is lower than the first.

Plagiarism or copying of other people's work is penalised 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 offences. That is why in the course of this subject any indication of plagiarism or misappropriation of texts or ideas other people (What is considered plagiarism?) as well as the improper or undeclared use of Artificial Intelligence in an activity, automatically translates into a suspension and/or other disciplinary measures (Normes de Convivencia de la Universitat de Vic-Universitat Central de Catalunya).

For any questions or queries, see the (Academic Regulations of the Bachelor's Degree of the Faculty of Design and Engineering Elisava UVic-UCC).

BIBLIOGRAPHY AND TEACHING RESOURCES

Arduino

- Artero, Ó. T. 2013. *Arduino: curso práctico de formación.* RC Libros.

- Bansi, 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 algoritmes* (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 = programes* (Vol. 7). Ediciones del Castillo.
- Preece, J.; Rogers, Y., & Sharp, H. 2015. *Interaction design: beyond human-computer interaction.* John Wiley & Sons

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