DEGREE IN INDUSTRIAL DESIGN ENGINEERING

SYLLABUS
COMPUTER-AIDED DESIGN

ACADEMIC YEAR: 2026-27
YEAR: 1st
NATURE: Basic Education
TERM: 2nd
ECTS credits: 6
CLASSROOM HOURS: 47
INDEPENDENT WORK HOURS: 103
TOTAL HOURS: 150
LANGUAGE/S: English
CODE: 17038

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PRESENTATION OF SUBJECT/OBJECTIVES
The subject Computer Aided Design is the introduction to 3D parametric modelling for product design and development. Students will learn how to model a product parametrically and communicate it clearly and accurately.

The subject focuses on the following key aspects
- Leveraging 3D parametric modelling software to recognise and model a product's different three-dimensional shapes.
- Establishing different strategies in parametric modelling, from geometric analysis and knowhow to assessing its implications in future changes and selecting the most appropriate option.
- Problem-solving in modelling and 3D assembly joints.
- Organising the different parts of a product representation in a clear and accurate fashion in 2D and 3D.

SUSTAINABLE DEVELOPMENT GOALS (SDGS)
This subject does not specifically incorporate any SDG.

CONTENT
BLOCK I: Introduction to Modelling
1.1. Design Process. From Concept to 3D.
1.2. Geometric Representation Techniques. Foundations of Spatial Conception.
1.3. Introduction to Parametric Modelling.

BLOCK II: Application of Parametric Software. Creation of 3D Parts.
2.1. Basic Functions: Extrude, Revolve, Shell, Round, Chamfer, Hole, Mirror.
2.2. Sketch Tools for Geometric Resolution: Parametric Benchmarks, Constraints, Auxiliary Geometry.
2.3. Tools for Complex Geometric Creations: Advanced Sketch, Sweep, Swept Blend, Helical Sweep.
2.4. Drawings. Parts and Assembly Drawings. General View, Section, Detailed View, Auxiliary View.

BLOCK III: Assemblies.
3.1. Part Restrictions in an Assembly and Setting Coordinate Origins.
3.2. Assemblies with Subassemblies. Project Coding.
3.3. Creation of Complex Geometry Components in Assemblies with Subassemblies. Boolean Operations between Parts in an Assembly.
3.4. Model Analysis Tools. Interferences.
3.5. Part Modelling and Reverse Engineering.

BLOCK IV: Dynamic Visual Treatment in Project Presentations.
4.1. Introduction to Rendering and Assembly Exploding
4.2. Assembly and Disassembly Animation.

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

SKILLSETS

- That the students have shown they have and understand knowledge in a study area that starts from the basis of general secondary education and is usually found at a level which, although supported in advanced text books, also includes some aspects that entail knowledge arising from the cutting-edge of their study field. (CB1)
- Develop a creative attitude of experimentation based on scientific and humanistic criteria that favours the exploration of relevant and innovative contributions. (CG1)
- 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. (CT4)
- Provide them with an educational process aimed at personal and professional improvement and acquire a comprehensive education that enables them to learn and coexist in a context of linguistic diversity and with very diverse social, cultural and economic realities. (CT7)
- Apply the modelling and simulation techniques used in industrial design engineering for suitable process selection and decision-making in project development. (CE2)
- Apply graphic expression techniques to suitably display and communicate designs and developments during the production process. (CE4)

LEARNING OUTCOMES

- Acquire and demonstrate advanced knowledge of theoretical and practical aspects and work methods in the field of calculation and modelling.
- Developed in virtual interaction contexts through the use of ICTs.
- Define their own learning goals and design coherent and realistic development processes with the same goals and in the time available.
- Visualise product design and digital formalisation.

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
P1-Observation of engagement	10
P2-Monitoring performed work	10
P4-Specific assessment tests: exams	50
P5-Performance of requisite work and projects	30

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	10%	NO	P-1
Activity-2 Individual Work and Weekly Exercises	10%	NO	P-2
Activity-3 Final Project	30%	YES*	P-5
Activity- 4 Half-Term Exams	15%	NO	P-4**
Activity-5 End of Term 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.

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

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.

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

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

- Félez & Martínez. 2000. *Dibujo Industrial.* Editorial Sintesis, (3ª edición).

- The teaching material for the subject will be supplied to the students progressively and will involve:
    - Sheets for coursework formulation
    - Guides for personal projects
    - Practice tutorials in 3D CAD software.

The teaching staff will supply a dedicated bibliography at the start of the subject, where applicable.

Facultat de Disseny i Enginyeria
ELISAVA