BACHELOR'S DEGREE IN INDUSTRIAL DESIGN ENGINEERING

SYLLABUS
GRAPHIC EXPRESSION

ACADEMIC YEAR: 2026-27
YEAR: 2nd
CHARACTER: Basic Training
SEMESTER: 3rd
ECTS: 6
TEACHING HOURS: 47
HOURS OF SELF-EMPLOYMENT: 103
TOTAL HOURS: 150
LANGUAGE/S: Spanish/Catalan
CODE: 17035

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PRESENTATION OF SUBJECT / OBJECTIVES
This subject lays the foundations for graphic communication with sketch drawing techniques and CAD programs. It is the starting point to achieve the knowledge of graphic representation in engineering through the practice of making industrial assemblies and the dismantling of their components, including their representation by applying the regulations of representation in manufacturing drawings.

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

CONTENTS
Block-I: Format and regulations.
1.1. Formats: Units, scales, line types and standardised formats, preparation and delivery of technical documentation.
1.2. Views: Elevation, plan and profile, section and section, auxiliary and detail.
1.3. Measuring tools: calliper, tape measurer, angle gauge, gauges, palmer, etc.
1.4. Dimensioning: Types of dimension and parts of the dimension, methods of dimensioning and regulations.

Block-II: Industrial criteria.
2.1. Plastic parts: Injection, rotational moulding, thermoforming.
2.2. Principle of interchangeability: Manufacturing and dimensional tolerances.
2.3. 3D Printing Parts: Basic concepts, types of printing and drawings for print control.
2.4. Sheet metal parts: Types of sheet metal and standardization, representation in drawings and operations in CAD software.
2.5. Extrusion parts: Own and standard extrusion profiles.
2.6. Welded parts: Types of welding and representation in drawings.
2.7. Threads: Types and representation, standardised components and operations in CAD software.
2.8. Geometric tolerances: Types, uses, reference elements and indication on the plane.
2.9. Machined parts: Turning and milling.
2.10. Surface conditions and finishes: Types of surfaces, roughness and indications on plans.
2.11. Bearings and bearings: Types and uses, CAD libraries.
2.12. ISO tolerances: Indication and calculation of tolerances.
2.13. Adjustments: Types of adjustments, use with dimensional tolerances and ISO, choice, design and calculation of adjustments.

TEACHING METHODOLOGIES
- Work sessions with the whole group, class with the teacher. (PA)

COMPETENCIES
- G1 - Develop a creative attitude of experimentation, under scientific and humanistic criteria, which favours the exploration of relevant and innovative contributions.
- G3 - Integrate formal sensitivity as a fundamental part of the project process.
- CB3 - Students must have the ability to gather and interpret relevant data (usually within their area of study) in order to make judgments that include reflection on relevant social, scientific or ethical issues

- T1 - Act 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.
- T5 - Exercise active citizenship and individual responsibility with a commitment to democratic values, sustainability and universal design, based on practices based on learning, service and social inclusion.
- T7 - To become the main actor in the training process itself with a view to personal and professional improvement and the acquisition of a comprehensive training that allows learning and living together in a context that respects linguistic diversity, with diverse social, cultural, gender and economic realities.
- E4 - Apply basic techniques of graphic expression, technical drawing and standardization for the proper visualization and communication of design and development during the production process.

LEARNING OUTCOMES

- Acquire and demonstrate advanced knowledge of the theoretical, practical and work methodology aspects in the field of graphic representation.
- Collects and interprets data and information on which to base their conclusions and decision-making.
- It globally evaluates the learning processes carried out according to the plans and objectives set and establishes individual improvement measures.
- Define their own learning objectives and design coherent and realistic development processes with the same objectives and time available.
- Carry out evaluation processes on their own practice and that of others in a critical and responsible way.
- Generates the necessary technical documentation to justify the viability of the project.
- Visualize their ideas by applying appropriate graphic expression techniques.
- Communicates your design through the appropriate modelling of your ideas.

TRAINING ACTIVITIES

Each subject will present at the beginning of the course its WORK PLAN where the didactic activities per week / session / autonomous work are recorded.

EVALUATION

EVALUATION SYSTEMS

The evaluation of the subject will be based on continuous monitoring of the student's academic work throughout the course.

EVALUATION SYSTEM	FINAL WEIGHTING
P1-Observation of participation	10
P2-Follow-up of the work done	15
P4-Specific assessment tests: exams	25
P5-Completion of required work or projects	50

EVALUATION CRITERIA

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

ASSESSABLE ACTIVITY	WEIGHT	RETRIEVABLE (up to 50%)	EVALUATION SYSTEM
Class attendance and participation	10%	NO	P-1
Activity E01 – Formatting and Views	7,5%	NO	P-2
Activity E02 – Start of delimitation	7,5%	NO	P-2
Activity P01 – Plastic Project	15%	YES*	P-5
Activity P02 – Metal Project	15%	YES*	P-5
Activity P03 – Final Project	20%	YES*	P-5
Final Exam Activity	25%	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.
* If 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.

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 someone else'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 of other people (What is considered plagiarism?) as well as the improper or undeclared use of Artificial Intelligence in an activity, automatically translates into a failure 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

- Brent Maxfield. 2006. *Engineering with Mathcad.* London: Butterworth-Heinemann.
- Morris, Carla C, and Robert M. Stark 2015. *Fundamentals of Calculus*. New York: John Wiley& Sons.
- Penney, Richard C. 2015. *Linear Algebra: Ideas and Applications.* New York: John Wiley& Sons.
- Steven J. Janke. 2014. *Mathematical Structures for Computer Graphics*. New York: John Wiley& Sons.
- Vince. 2010. *Mathematics for computer graphics*. Suiza: Springer.

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