



Course guide

220084 - EG1 - Graphic Expression I

Last modified: 08/06/2023

Unit in charge: Terrassa School of Industrial, Aerospace and Audiovisual Engineering
Teaching unit: 717 - DEGD - Department of Engineering Graphics and Design.

Degree: BACHELOR'S DEGREE IN INDUSTRIAL TECHNOLOGY ENGINEERING (Syllabus 2010). (Compulsory subject).

Academic year: 2023 **ECTS Credits:** 6.0 **Languages:** Catalan, Spanish

LECTURER

Coordinating lecturer: JORDI VOLTAS AGUILAR

Others: Sergio Vázquez Francos
Marc Jodar Roca
José Antonio Mariño
Enric Brasó Vives
Júlia Espona Graell
Elisabet Quintana Vilajuana
Marc Rodríguez Novas

PRIOR SKILLS

The new student is supposed to have some manual dexterity in drawing sketches and sketches, as well as the appropriate use of the basic tools of traditional drawing: compass, square, bevel, angle conveyor, scale, ...

It is also desirable that you have previously practiced with a basic computer drawing software, at least 2-dimensional tracing.

On the other hand, other skills are required and previous qualities more generic and applicable to any other activity within the university academic field, such as the spirit of sacrifice, neatness, the ability to synthesize, teamwork, respect for others of classmates, and the teacher, the constancy ..."

DEGREE COMPETENCES TO WHICH THE SUBJECT CONTRIBUTES

Specific:

CE05-INDUS. Spatial vision and knowledge of graphic representation techniques, both by traditional methods of metric geometry and descriptive geometry, and through computer-aided design applications. (Basic training module)

TEACHING METHODOLOGY

Learning based on practical realization.

Face-to-face sessions with exposition of concepts, techniques and procedures, combined with the resolution of exercises and practical work with computer in the CAD laboratory. The theoretical bases of the subject, concepts, methods and results will be introduced illustrating with convenient examples to facilitate their understanding.

There will be 3 types of practical sessions:

- Sessions in which the practices will consist of statements and guided processes to achieve a result.
- Sessions in which the practices will consist only of statements without specifying the process of obtaining the solution.
- Control practices.

Individual autonomous work of study, preparation and realization of exercises. Students, independently will have to study to assimilate the concepts, solve the proposed exercises either manually or with the help of the computer.

Project-based cooperative learning, oriented to the realization of problems and projects evaluable in team. The transversal work of the course will be focused on scheduled non-contact group activities. Its resolution will be made outside the practice classroom and in groups of up to 3 people. This cross-cutting work will always include a public defense of the end result.

All its content will be conveyed through the ATENEA platform.

All deliveries other than manuals will be made through the ATENEA platform.

Depending on the needs of the center, some students may be required to attend the classroom with their own laptop in order to develop the session.

LEARNING OBJECTIVES OF THE SUBJECT

The objectives of this subject are:

Facilitate and enhance the student's capacity for abstraction and their vision of space

Introduce the concepts, techniques and methodologies of the area of Graphic Expression in Industrial Engineering

Get acquainted and use the graphic technical language of the industrial environment

STUDY LOAD

Type	Hours	Percentage
Self study	90,0	60.00
Hours medium group	60,0	40.00

Total learning time: 150 h

CONTENTS

TOPIC 1: PLANE GEOMETRY

Description:

Geometric layouts with conditions of perpendicularity and parallels.

Geometric layouts with tangent conditions.

Concept of the axis of symmetry.

Creating restricted paths with CAD software.

Full-or-part-time: 12h 15m

Practical classes: 5h

Self study : 7h 15m



TOPIC 2: REPRESENTATION SYSTEMS

Description:

Cylindrical-orthogonal systems

- Dihedral
- Axonometric
- Isometric

Oblique and conical systems

Scale concept

Third sight determination exercises and isometric constructions

Related activities:

Full-or-part-time: 10h

Practical classes: 4h

Self study : 6h

TOPIC 3: INDUSTRIAL STANDARDISATION

Description:

Preliminaries. Industrial standards.

Freehand technical drawing.

Obtaining standard views.

Treatments: cuts, sections and breaks.

Dimensioning: industrial dimensioning guidelines.

Threads and other standard elements.

Graphic representation of industrial assemblies.

Full-or-part-time: 72h 30m

Practical classes: 29h

Self study : 43h 30m

ITEM 4. SPACE GEOMETRY

Description:

Determination of angles between straight lines and planes

Determination of angles between faces

Determination of minimum distances between lines that intersect but do not intersect

Prisms, pyramids, and pyramid trunks. Complete and truncated bodies.

Related activities:

Full-or-part-time: 55h 15m

Practical classes: 22h

Self study : 33h 15m

GRADING SYSTEM

A model of continuous assessment will be applied for the basic purpose of weighing both self-employment and teamwork of students. The assessment of the acquisition of knowledge, skills and abilities will be carried out from:

- 5% Weekly internship deliveries
- 30% Partial primer
- 30% Partial second
- 15% Report and oral presentation of a group work
- 10% Sketch I
- 10% Sketch II

Unsatisfactory results of the "First Part" exam may be corrected by the hand - outlined test called "Sketch II" (to be taken during class time).

Those students who, having presented themselves, have obtained a grade lower than 5. The maximum grade that can be obtained through the renewal will be 5, and it will not be possible to result in a grade lower than the one initially obtained.

As this subject is offered in two semesters, no re-assessment is offered.

EXAMINATION RULES.

This is a face-to-face subject. A set of deliverables emerges from the weekly sessions. In order to make the delivery, it is a requirement to have completed the corresponding face-to-face session.

The student is responsible for his / her own material for the sketch tests.

The student will adjust to the start and end times of the test.

BIBLIOGRAPHY

Basic:

- Corbella Barrios, David. Técnicas de representación geométrica: con fundamentos de concepción espacial. Madrid: l'autor, 1993. ISBN 846047495X.
- Torrella Font, A.M. [et al]. Exercicis d'expressió gràfica: geometria plana-llocs geomètrics, sistema axonomètric, sistema dièdric. Barcelona: Unicopi, 2007. ISBN 9788461151875.
- Rendón Gómez, A. Geometría paso a paso [on line]. Madrid: Tébar, 2000-2001 [Consultation: 03/05/2022]. Available on: <https://ebookcentral-proquest-com.recursos.biblioteca.upc.edu/lib/upcatalunya-ebooks/detail.action?docID=4824007>. ISBN 8495447088.
- Félez, Jesús. Dibujo industrial. Madrid: Síntesis, 1995. ISBN 8477383316.
- Ramos Barbero, B.; García Maté, E. Dibujo técnico [on line]. 3a ed. Madrid: AENOR, 2016 [Consultation: 15/06/2022]. Available on: <https://ebookcentral-proquest-com.recursos.biblioteca.upc.edu/lib/upcatalunya-ebooks/detail.action?pg-origsite=primo&docID=6774114>. ISBN 9788417891237.
- Rodríguez de Abajo, F. Javier; Álvarez Bengoa, Víctor. Curso de dibujo geométrico y de croquización: primer curso de escuelas de ingeniería. 12ª ed. San Sebastián: Donostiarra, cop. 1992. ISBN 847063173X.

Complementary:

- Asociación Española de Normalización y Certificación. Dibujo técnico. 3a ed. Madrid: AENOR, 2005. ISBN 8481434337.
- Equip Tècnic EDEBÉ. Col·lecció Teoria de Tècniques d'Expressió Gràfica. Madrid: Bruño-Edebé, 1981.
- Hernández Abad, F. Lugares geométricos: su aplicación a tangencias. Barcelona: Edicions UPC, 1993. ISBN 8476532814.

RESOURCES

Hyperlink:

- <http://ocw.upm.es/expresion-grafica-en-la-ingenieria/> <http://www.tododibujo.com/>
- <http://ocw.unican.es/ensenanzas-tecnicas/expresion-grafica-y-dao/>