



# Course guide

## 320139 - MD - Design Methodology

Last modified: 08/05/2025

**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 DESIGN AND PRODUCT DEVELOPMENT ENGINEERING (Syllabus 2010). (Compulsory subject).

**Academic year:** 2025    **ECTS Credits:** 6.0    **Languages:** Catalan, Spanish

### LECTURER

**Coordinating lecturer:** JOSE LUIS LAPAZ CASTILLO

**Others:** JOSE LUIS LAPAZ CASTILLO

### PRIOR SKILLS

- General knowledge: geometry, CAD and industrial standards.
- Vision spatial abstraction and synthesis.
- Planning: order and systematization.
- Skill manual: freehand drawing.
- Inventiveness and creativity.
- Critical analysis of construction.

### DEGREE COMPETENCES TO WHICH THE SUBJECT CONTRIBUTES

#### Specific:

CED41-DIDP. Mastery of tools related to the design process. (Specific technology module: Industrial Design)  
CED48-DIDP. Ability to understand and apply the creative process and its organization. (Specific technology module: Industrial Design)  
CED57-DIDP. Practical ability to redesign products. (Specific technology module: Industrial Design)  
CED58-DIDP. Practical knowledge of industrial design methodology. (Specific technology module: Industrial Design)  
CED43-DIDP. Knowledge of design methodology. (Specific technology module: Industrial Design)

#### General:

CG01-DIDP. Ability to conceive, develop, understand and execute the product design process, within a necessary balance between technical and socio-cultural context, responding to the needs of the company, the market, society and users.

### TEACHING METHODOLOGY

The methods applied are:

- Individual independent work study for the preparation and conduct of exercises.
- Project-Based Cooperative Learning (Cooperative Project Based Learning), aimed at the realization of computer problems and assessable projects.

In the sessions of explanatory content will introduce the theoretical foundations of the subject, concepts, methods, and illustrating it with suitable examples to facilitate understanding results.

The practical sessions in the classroom consist of statements and guided process to get a result.

The students should study independently to assimilate concepts and solve the cases and the exercises.

The transverse course work will focus on the end-face group work no matter scheduled and collected most of concepts covered during the course. Its resolution will practice outside the classroom and in groups of a maximum of 4 people.

Own use of the ATHENA platform tools to enhance collaborative learning will be. Support tools and work, office suites (word processing, spreadsheet, multimedia presentations, ...), social networks, wikis and blogs are used.



## LEARNING OBJECTIVES OF THE SUBJECT

OAG1: acquire a global vision of different methodologies applied during the disintegration of industrial design process.

OAG2: training for solve problems on the integratet design (preliminary, conceptual) and applicability.

OAG3: Introduces some usual methodological thechniques at industrial design.

OAG4: work with practical cases of industrial design and redesign.

## STUDY LOAD

Type	Hours	Percentage
Hours small group	45,0	30.00
Self study	90,0	60.00
Hours large group	15,0	10.00

**Total learning time:** 150 h

## CONTENTS

### TOPIC 1: PRODUCT AND METHODOLOGY DESIGN.

#### Description:

- 1.1. General aspects to the design.
- 1.2. Fundamentals of design.
- 1.3. The current methodology.
- 1.4. The type of industrial products.
- 1.5. The life cycle of the product.
- 1.6. The stages in Industrial Design.

#### Related activities:

AV10: PRESENTATION OF COURSE AND SUBJECT.

#### Related competencies :

CED43-DIDP. Knowledge of design methodology. (Specific technology module: Industrial Design)

#### Full-or-part-time: 4h

Theory classes: 1h

Laboratory classes: 1h

Self study : 2h



## TOPIC 2: THE PRELIMINARY PHASE. INFORMATION AND ANALYSIS. NEEDS IDENTIFICATION.

### Description:

- 2.1. Planning.
- 2.2. The design of the e-portfolio.
- 2.3. The search for information and documentation required.
- 2.4. User feedback.

### Specific objectives:

- CED43: Knowledge of Design Methodology
- CED48: Ability to understand and apply the creative process and organization
- CED54: Ability to analyze, design and project in design workshops
- CED57: Practical ability to redesign products

### Related activities:

- AV21: COMPARATIVE STUDY, AND SELECTION OF PORTFOLIO
- AV22: PRACTICAL APPLICATION OF DIFFERENT TECHNIQUES OF INDUSTRIAL INFORMATION SEARCH
- AV23: USER REVIEWS
- AV60: PBL INTEGRATED METHODOLOGY & GRAPHICS ENGINEERING

### Related competencies :

- CED43-DIDP. Knowledge of design methodology. (Specific technology module: Industrial Design)

### Full-or-part-time: 12h

- Theory classes: 3h
- Laboratory classes: 9h

## TOPIC 3: CONCEPTUAL DESIGN. GENERATING IDEAS, SOLUTIONS AND DESIGN ALTERNATIVES.

### Description:

- 3.1. Previous conceptual ideas.
- 3.2. The product definition: description, functions and requirements.
- 3.3. Research and market analysis. The needs associated with the product.
- 3.4. Product specifications: the characteristics and requirements of the product.
- 3.5. Design alternatives.

### Specific objectives:

- CED43: Knowledge of Design Methodology
- CED54: Ability to analyze, design and project in design workshops

### Related activities:

- AV31: VISUALS & FUNCTIONALS INCONSISTENCES
- AV33: CREATIVE GROUP WORK-COLLABORATIVE
- AV34: BRAINSTORMING
- AV35: SCAMPER METHODOLOGY
- AV36: FUNCTIONAL DIAGRAMS
- AV37: MORPHOLOGICAL ANALYSIS
- AV60: PBL INTEGRATED METHODOLOGY & GRAPHICS ENGINEERING

### Related competencies :

- CED43-DIDP. Knowledge of design methodology. (Specific technology module: Industrial Design)

### Full-or-part-time: 9h

- Theory classes: 3h
- Self study : 6h



## TOPIC 4: THE ECONOMIC ASPECTS IN THE DESIGN PROCESS. METHODS OF ASSESSMENT AND EVALUATION OF DESIGN

### Description:

- 4.1. Evaluating alternatives and making decisions.
- 4.2. Evaluation activity designer.

### Specific objectives:

CED43: Knowledge of Design Methodology  
CED57: Practical ability to redesign products

### Related activities:

AV41: PRACTICAL EXERCISES OPTIONS ASSESSMENT AND DECISION MAKING  
AV60: PBL INTEGRATED METHODOLOGY & GRAPHICS ENGINEERING

### Related competencies :

CED57-DIDP. Practical ability to redesign products. (Specific technology module: Industrial Design)  
CED43-DIDP. Knowledge of design methodology. (Specific technology module: Industrial Design)

### Full-or-part-time: 4h

Theory classes: 1h  
Self study : 3h

## TOPIC 5: OPTIMIZATION INDUSTRIAL DESIGN PROCESS

### Description:

- 5.1. Design and development of integrated products. Continuous improvement.
- 5.2. Analysis and value engineering.
- 5.3. Linear programming applied to design optimization.
- 5.4. The design of concurrent engineering environments.

### Specific objectives:

CED43: Knowledge of Design Methodology  
CED54: Ability to analyze, design and project in design workshops

### Related activities:

AV51: INDUSTRIAL PROCESS OPTIMIZATION DESIGN EXERCICES  
AV60: PBL INTEGRATED METHODOLOGY & GRAPHICS ENGINEERING

### Related competencies :

CED43-DIDP. Knowledge of design methodology. (Specific technology module: Industrial Design)

### Full-or-part-time: 14h

Theory classes: 9h  
Self study : 5h



## GRADING SYSTEM

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A continuous evaluation model will be applied with the basic purpose of pondering both the autonomous work and the team work of the students.

The evaluation of the acquisition of knowledge, skills and abilities will be calculated considering the following weighting (in percentages on the Final Course Note):

Evidence to evaluate:

- a) Obligatory, individual and grouped Activities (AV) periodicals scheduled during the course: 40%
- b) Challenge-individual design contest (creative work): 20%
- c) PBL - Inter-asignaturas final group work (Design and Graphic Engineering Methodology):
  - Report and public presentation: 10%
  - Cross-disciplinary competence teamwork (Level 2): 10%
- d) Group work to expand the PBL: 20%

During the theoretical sessions, additional complementary activities may be proposed, which may be used to increase the AV submission note, section a) at a maximum of 10%.

Given the type of subject, NO written essay will be done (controls, partial and final exams)

## EXAMINATION RULES.

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The related classroom activities will be at the center computer classrooms and non-classroom related activities (individual and group), can be done at home or in school facilities provided for that purpose (study hall, computer rooms for general use , campus library, ...)

## BIBLIOGRAPHY

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### Basic:

- Ulrich, Karl T.; Eppinger, Steven D. Diseño y desarrollo de productos. 5<sup>a</sup> ed. México: McGraw-Hill, 2013. ISBN 9786071509444.
- Boeijen, Annemiek van [et al.]. Delft design guide: perspectives, models, approaches, methods. Revised ed. Amsterdam: BIS Publishers, 2020. ISBN 9789063695408.
- García Melón, Mónica [et al.]. Metodología del diseño industrial. Valencia: Universidad Politécnica de Valencia, 2001. ISBN 849705024X.

### Complementary:

- Sanz Adán, F.; Lafargue Izquierdo, J. Diseño industrial: desarrollo del producto. Madrid: Paraninfo, 2002. ISBN 9788497320764.
- García Melón, Mónica [et al.]. Fundamentos del diseño en la ingeniería. Valencia: UPV, 2009. ISBN 9788483633861.

## RESOURCES

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### Other resources:

Web Resources (design magazines and blogs):

- Core 77 Design Magazine & Resource. Available at [www.core77.com](http://www.core77.com)
- Dezeen. Design magazine. Available at [www.dezeen.com](http://www.dezeen.com)
- Behance. Online Portfolios. Available at [www.behance.net](http://www.behance.net)
- Phil Design Studio. Available at [www.phildesign.eu](http://www.phildesign.eu)
- Coroflot. Design Jobs & Portfolios. Available at [www.coroflot.com](http://www.coroflot.com)