



Course guide

340084 - TAD3 - Design Workshop III

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Unit in charge: Vilanova i la Geltrú School of Engineering
Teaching unit: 702 - CEM - Department of Materials Science and Engineering.
712 - EM - Department of Mechanical Engineering.
737 - RMEE - Department of Strength of Materials and Structural Engineering.
717 - DEGD - Department of Engineering Graphics and Design.
732 - OE - Department of Management.

Degree: BACHELOR'S DEGREE IN INDUSTRIAL DESIGN AND PRODUCT DEVELOPMENT ENGINEERING (Syllabus 2009). (Compulsory subject).

Academic year: 2026 **ECTS Credits:** 6.0 **Languages:** Catalan, Spanish

LECTURER

Coordinating lecturer:

Others:

DEGREE COMPETENCES TO WHICH THE SUBJECT CONTRIBUTES

Transversal:

1. EFFICIENT ORAL AND WRITTEN COMMUNICATION - Level 2. Using strategies for preparing and giving oral presentations. Writing texts and documents whose content is coherent, well structured and free of spelling and grammatical errors.
2. THIRD LANGUAGE. Learning a third language, preferably English, to a degree of oral and written fluency that fits in with the future needs of the graduates of each course.
3. TEAMWORK - Level 2. Contributing to the consolidation of a team by planning targets and working efficiently to favor communication, task assignment and cohesion.
4. EFFECTIVE USE OF INFORMATION RESOURCES - Level 2. Designing and executing a good strategy for advanced searches using specialized information resources, once the various parts of an academic document have been identified and bibliographical references provided. Choosing suitable information based on its relevance and quality.

TEACHING METHODOLOGY

Being Design Workshop 3 (TAD3), the last of the different Design Workshops that are part of the Degree in Design Engineering and Product Development, following a Methodology called Total Product Design will be attributed to TAd3, this Design Workshop, which the Methodology calls: INTEGRAL DESIGN Workshop.

- In the different Design Workshop Sessions 3 (TAD3), the contents will be presented and the basic theoretical concepts and, above all, the practical Project content of the different Subjects linked to the different Departments that form and integrate the TAD3 subject will be introduced, with applications, convenient practices and examples to facilitate your understanding. Define the different parts that make up the Total Design.

The student must be able to develop at an individual level the different activities linked to all the Subjects that make up the Project or proposed needs, later integrating them into the work group, called Workshop Group or Working Group (GT).

- The Practices or Design Workshop Project 3 are made up of:

- 1) Sessions where the activities of the GTs and the corresponding works will be defined based on a single proposed Project.
- 2) Define the two phases to be developed of the proposed Project based on the evaluations scheduled by the center.
- 3) Complement with global or specific comments so that the GT students can develop the proposed project.
- 4) Guided and personalized monitoring to achieve a more efficient result for the students and the GT group specifically.
- 5) Define the Product Design Specifications (EDP): the EDS and the EDC.
- 6) The traceability of a Product in all its industrial and social areas: Industrialization, Manufacturing, marketing, logistics, user interaction, costs... as most relevant among others.

- In Design Workshop 3 the following will be considered:

- 1) Handling of existing products: disassembly and assembly of specific products or components.
- 2) Guided monitoring to achieve an optimal result for the GT in the two phases to be developed of the proposed Project.
- 3) Possibility of making the corresponding model. (Prototypes in possible media and possible solutions).
- 4) Guided and personalized monitoring to achieve a more efficient result for the students and the GT group specifically.

- The final result of the GT Project is the compendium of all the Specific Subjects analyzed in the different activities and agreed upon in the GT based on the synthesis of all the individual Activities of each student on the different Subjects covered in the Project.

-This result in the GT Project contemplates and implies a very important part in the development of the student's Personal Activities, as well as those at the GT group level. On the other hand, said result must also reflect, and no less important, the Management of the Project to be developed by the WG with its own planning and monitoring activities for the proper development of the Project to be defined.

- Continued attendance at the Design Workshops is of vital importance and significance to achieve good monitoring, development and final result of the Project, both in the individual and group level activity.

- Autonomous learning is aimed at carrying out the presentation of projects, as well as the search for complementary information, and the manipulation of existing products or components.

LEARNING OBJECTIVES OF THE SUBJECT

- Acquire more specific training on the Product and its components, as well as become familiar with the different parts that make it up. Comprehensive Product Analysis: structures and modules that define it.
- Define in this Design Workshop 3 the broader concept of Total Design and its development process.
- Enhance the skill, ingenuity and ability to analyze and manipulate industrial products of all kinds.
- Integrate into Product Engineering: the definition and traceability of a product in all its technical and social areas.
- To develop a technical capacity that allows to solve effectively the proposed projects and the ideas that they themselves generate contributing value to the solution.
- Design and Project the whole process of product development from the conceptual theoretical knowledge of the different subjects that make up the Design Workshop 3.
- Acquire a global and comprehensive vision of the product. Product and its components. Structure of a product.
- Apply important concepts such as: EcoDesign, Product Life Cycle (PLM) ... among others, within the global concept of circular economy.
- Define your own content in the definition and management of a Design or Product Engineering Project.
- Develop a critical and self-critical attitude towards one's own work and that of classmates.

STUDY LOAD

Type	Hours	Percentage
Hours large group	30,0	20.00
Hours small group	30,0	20.00
Self study	90,0	60.00

Total learning time: 150 h

CONTENTS

1. DESIGN AND DEVELOPMENT OF COMPLEX PRODUCTS. INTEGRAL DESIGN

Description:

- Study and Analysis of a Methodology that allows addressing the entirety of a wide-scope project.
- Integrate the entire Total Design Process: EDP, Conceptual Design and Detail Design.
- Have Circular and Sustainable Design as a reference in the design process.

Full-or-part-time: 1h 40m

Theory classes: 1h 40m

2. ANALYSIS AND STUDY OF THE FUNCTIONS OF THE PRODUCT/PROJECT. INNOVATION I ERGONOMICS.

Description:

- Identify the main parts and functions of the product linked to the chosen project.
- Address the main Forms and Functions of the Modules and Components associated with the proposal made.
- Define the first conceptual designs of the problem or proposal raised.
- Define the study of Ergonomics: Product User Interaction. Usability.

Full-or-part-time: 1h 40m

Theory classes: 1h 40m

3. ANALYSIS OF THE STRUCTURE AND COMPOSITION OF THE PRODUCT. MATERIALS.

Description:

- From the different Conceptual Design:
 - . Proposal for study and selection of the different Materials linked to the Components and Modules.
- From the Final Conceptual Design:
 - . Define in the final proposal the materials assigned to the entire Product.

Full-or-part-time: 1h 40m

Theory classes: 1h 40m

4. ANALYSIS OF THE STRUCTURE AND COMPOSITION OF THE PRODUCT. ENDURANCE.

Description:

- From the Conceptual Design:
 - . Proposal for study and analysis of Resistance of the different Components and Modules
- From the Final Conceptual Design:
 - . Define in the final proposal the resistance of the assigned materials.
 - . Possibilities to modify the shape due to the definition of resistance in the Modules and Components.

Full-or-part-time: 1h 40m

Theory classes: 1h 40m

5. ANALYSIS OF THE PRODUCT COMPONENTS. MECHANISMS AND DEVICES.

Description:

- From the Conceptual Design:
 - . Proposal for study and analysis of devices or mechanisms to be integrated into the Product to obtain the different functions and actions required in the Modules and Components of the Product.
- From the Final Conceptual Design:
 - . Define in the final proposal the devices or mechanisms assigned to the final product.

Full-or-part-time: 1h 40m

Theory classes: 1h 40m

6. PRODUCTION AND MANUFACTURING TECHNIQUES II. ASSESSMENT.

Description:

- From the final proposal of the defined Conceptual Design:
 - . Define and analyze the different possibilities in manufacturing and production of the different parts of the Final Product: Modules and Components.
- From the Final Conceptual Design:
 - . Define the final proposal for the greatest possible sustainability; in the manufacturing, production and ergonomics study of the final product.
 - . Study and Evaluation of improvement; in the quality of the product, in assembly and distribution.

Full-or-part-time: 1h 40m

Theory classes: 1h 40m

DESIGN WORKSHOP PRACTICES

Description:

- The different sections discussed in the Design Workshop will be developed.
- Different initial volumetric models will be defined that identify possible proposals and palted solutions.
- Build and de-construct volumetric shapes of the different Modules and components, if applicable.
- About the chosen project: Define a prototype within the month adjusted to reality with the final proposal of the WG. Basis for the presentation and communication of the project.

Every Activity developed in the Design Workshops includes:

- INDIVIDUAL PROPOSAL:

It must be kept in mind that the Individual Activity (AI) developed by each student is equal to a Written Document (a Report); which will contain text, images, graphics...among others, it will never be equal to just Images. All the Individual Activities developed by each student in the Design Workshop, in the different Projects developed, will be the student's most important asset, also for their final evaluation.

- GROUP PROPOSAL from the WG.

The result of the WG working group is the collaborative work between the members of the WG with the Personal Contributions of each student on each Specific Subject (corresponding to each Department) to define a common or Group Project as the final proposal of the WG. not the division or inhibition of these Matarias by the students in the GT.

It is necessary to enrich the Project and define it with the best of the contribution of each GT student. The final result of the WG Project is the compendium agreed upon by the WG of the Synthesis of the best individual Activities of the members of the WG.

Full-or-part-time: 50h

Practical classes: 50h

AUTONOMOUS LEARNING

Description:

-The students, according to the established study plan, have a few hours per week outside of those established in person with the subject teachers in the Design Workshop.

During these hours of autonomous learning, students can use the Design Workshops to continue developing the Project with the corresponding models or mockups associated with it. To do this, they will use all means of utensils, materials and machinery.

- Non-face-to-face autonomous learning is also aimed at assimilating and developing the contents of the different Subjects of the subject, as well as the Presentation of the Project, search for information..., among others.

Full-or-part-time: 90h

Self study : 90h

GRADING SYSTEM

The evaluations of the different Departments with their Specific Subjects that make up the TAD3 subject are linked to the corresponding percentages on the Project proposals chosen by the WG, the percentages on the final grade of the subject are:

BUSINESS ORGANIZATION. -OE 10%
GRAPHIC AND DESIGN ENGINEERING..... -EG 10%
MECHANICAL ENGINEERING..... -ME 25%
ELASTICITY and RESISTANCE OF MATERIALS..... -RM 25%
SCIENCE and ENGINEERING OF MATERIALS..... -CM 30%

The Departments that are part of the TAD3 subject will assess the different Specific Parts and Subjects defined by the Project developed and chosen by the Workshop Group. Linked to the corresponding individual Activities (AI) of each student, as well as those of the group on the chosen Project, based on the two existing Evaluations:

- Partial Evaluation Test (PAP). INITIAL PHASE: Conceptual Design of the proposal Project of all Subjects (30% of the final project grade).
- FINAL Evaluation Test (PAF). FINAL PHASE: Comprehensive Project Design, final definition of the Project (70% of the final project grade).

The Valuation Notes of the two Evaluations (Note A and Note B) are defined by the following sections and percentages:

NOTE A. ASSESSMENT on the Definition and Content of the Project.

- GT Project Report..... 10%
- Presentation and Technical Exhibition of the Project.... 20%
- Specific Subject Developed..... 30%
- Definition of the Final Model of the GT..... 40%

NOTE B. ASSESSMENT in Project Management and Monitoring.

In this section, the monitoring and good planning and management by the Workshop Group (GT) and the students who form it will be assessed. Not having an entrepreneurial attitude in the Management and monitoring of the Project can penalize the Note A (Definition and Content of the Project) by up to 20% less, contemplated from your individual activity, as well as the group activity. This Grade B has an impact on the final grade of the project and consequently the overall grade of the subject. The main indicator of this assessment, among others, is that established in the Standards and Guidelines for carrying out and monitoring the different activities and subjects.

The Individual Activity (AI) developed in each Specific Subject by each GT student is the main basis for its evaluation, this activity is the one projected on the project and other GT activities, thus obtaining the individual and main grade. in the final course grade.

Continued attendance by the student in the Design Workshops is a necessary condition to pass the subject.

The re-Evaluation according to the academic regulations of the Degree and Master's studies of the EPSEVG, in this Project-based subject, is not appropriate to carry out.

For proper functioning and monitoring of the subject, it is necessary to keep in mind the different publications made by the person responsible for the subject, as well as by the teachers of the different Specific Subjects of TAD3 on the digital campus (Atenea).

EXAMINATION RULES.

It is mandatory to attend and actively participate in the Design Workshop and to have a respectful, critical and active attitude for the improvement of the results obtained, both on a personal and group level.

- In order to define the Activity and its content (Note A), and its Monitoring and Entrepreneurship (Note B) of each student (main indicator in the personal evaluation) as of the rest of the students of the Group of Workshop (WG), in the Project it is necessary to do:

- 1) The Weekly Follow-up Report (AS).
- 2) The Global Monitoring Act (AG).
- 3) The Documentation developed with its structure and content corresponding to the defined Project will be made following the guidelines established in the document published in Atenea.

The Projects or Works will be delivered following the guidelines and format established in the Digital Campus (Atenea).



BIBLIOGRAPHY

Basic:

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- Kalpakjian, Serope; Schmid, Steven R. Manufacturing engineering and technology. 8th ed. Harlow: Pearson Education Limited, 2023. ISBN 9781292422244.
- Ashby, M. F.; Johnson, Kara. Materials and design : the art and science of material selection in product design [on line]. 2nd ed. Amsterdam [etc.]: Elsevier Butterworth Heinemann, 2010 [Consultation: 20/02/2024]. Available on: <https://www.sciencedirect-com.recursos.biblioteca.upc.edu/book/9781856174978/materials-and-design>. ISBN 9781856174978.
- Budynas, Richard G.; Nisbett, J. Keith. Diseño en ingeniería mecánica de Shigley [on line]. 10a ed. Ciudad de México: McGraw-Hill, 2018 [Consultation: 14/02/2024]. Available on: <https://ebookcentral-proquest-com.recursos.biblioteca.upc.edu/lib/upcatalunya-ebooks/detail.action?pq-origsite=primo&docID=5485813>. ISBN 9781456262112.