Course guide
340076 - TAD2-D4O17 - Design Workshop II

Last modified: 18/07/2024

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

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

Academic year: 2024 **ECTS Credits:** 6.0 **Languages:** Catalan, Spanish

LECTURER

Coordinating lecturer: Manuel López Membrilla

Others: Departament 702-CEM: Joan Vicent Castell Balaguer, Eulalia Nogues Boada.
Departament 712-EM: Marc Escolà Fernández, Paula Ramos i Erick Chavez.
Departament 717-EGiD: Manel L. Membrilla i Alba Torras.
Departament 732-OE: Josep Maria Colomer Mur.
Departament 737-RMEE: Antoni Andreu Torras.

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 INFORMATI0N 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 2 (TAD2), the second of the different Design Workshops that are part of the Degree in Design Engineering and Product Development, following the Methodology called Total Product Design and attributing to TAD2 in this Workshop. Design called: DETAIL DESIGN Workshop.
- In the different Design Workshop Sessions 2 (TAD2), 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 TAD2 subject will be introduced, with Practical applications and convenient examples to facilitate your understanding.
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).

- Design Workshop Practices 2 are based on the main concept of the so-called Reverse Engineering on Products existing in the market. formed by:
1) Sessions to define the existing Products and the possibilities of work or Projects to be developed by each GT.
2) Complement with global or specific comments so that students can develop the proposed projects.
3) Guided follow-up to achieve a result.
4) Handling of existing products: disassembly and assembly of products. Students will define a Technical Report of the Analyzed Product and propose improvements or solutions to the analyzed and developed products.
- Sessions in the Design Workshop 2 (TAD2) will include:
1) Defined and scheduled monitoring to achieve objectives and results.
2) Handling of existing products: disassembly and assembly of products.
3) A Technical Report. Definition and justification of the different modules and components that make up the existing product analyzed.
4) Interaction between Product and User.
5) Proposal for redesign or improvement of the analyzed product.
6) Global memory. Preparation of the corresponding Documentation.
7) Possibility of making the corresponding model. (prototypes in possible media and solutions).

- 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 treated 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 GT with its own planning and monitoring activities for the proper development of the Project to be defined.

- Continued attendance at Design Workshops 2 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.

LEARNING OBJECTIVES OF THE SUBJECT

- To acquire a general and integral basic training on the products, as well as to become familiar and to know the different parts that form them. Internal and external analysis of a product. Justification and definition of the different modules and component of the same.
- Enhance the skill, ingenuity and ability to analyze and manipulate an industrial product.
- To develop a minimum technical capacity that allows to solve effectively the proposed projects and the ideas that they themselves generate.
- Interpret the process of product development from the basic theoretical and conceptual knowledge of the different subjects that make up the Design Workshop 2.
- Acquire an overview of the product. Product and its components. Structure of a product. Principle of operation and use of the different parts of a product.
- Enhance the skill, ingenuity and ability to analyze, manipulate and contextualize an industrial product. As well as its own content in the definition and management of a Design or Product Engineering Project.
- Expand concepts of Ergonomics and Product.
- Product Overview. Product and its life cycle.
- To develop a critical and self-critical attitude towards their own activities and the activities and work of classmates in the work group or Workshop Group (WG).

STUDY LOAD

Type	Hours	Percentage
Hours large group	30,0	15.15
Self study	138,0	69.70
Hours small group	30,0	15.15

Total learning time: 198 h

CONTENTS

1. EXISTING PRODUCTS AND IMPROVEMENTS. PRODUCT REDESIGN.

Description:
-The students will select different existing products and select a product to develop the different activities linked to the selected product.
-The existing product must be transported, so that it can be analyzed and processed outside the Design Workshops if necessary.
-It must be of a relatively low complexity to be able to develop the different parts and phases of the Design Workshop 2.

Full-or-part-time: 3h
Theory classes: 3h

2. DEVELOPMENT BASED ON THE STUDY AND ANALYSIS OF THE EXISTING.

Description:
- Based on the chosen Product, they will identify the different physical parts that make up a Product:
The Global Product, its Modules and Components.
- Describe and define the main function of the chosen Product as well as the functions of the different Modules and Components that make it up.

Full-or-part-time: 3h
Theory classes: 3h

3. INDUSTRIAL DESIGN METHODOLOGY. DESIGN PROCESS. REVERSE PRODUCT ENGINEERING.

Description:
498 / 5.000
-Reverse Engineering Study:
. They will disassemble the chosen Product using the existing tools and supplies in the Design Workshop.
. Analysis of Components and Modules, their relationship with the corresponding justification of the Form-Function.
. Analysis of the different devices that make it up: mechanical, electrical... among others.
. Analysis of Materials and Resistance.
- Keep in mind the study of Ergonomics with the chosen Product: Product-User Interaction. Usability.

Full-or-part-time: 3h
Theory classes: 3h

4. PRODUCTION AND MANUFACTURING TECHNIQUES. ASSESSMENT.

Description:
-Identify the main basic Techniques used for the Manufacturing and Production of the chosen Product:
Modules and Components of the developed Product.
-Identify and define the possibilities of the Materials.
-Identify and define the possibilities of devices and mechanisms.

Full-or-part-time: 3h
Theory classes: 3h

5. PRESENTATION TECHNIQUES.

Description:
-Define the basic graphic structure for the Presentation of the analyzed Product.
-Describe, also on a graphical basis, each of the Modules as their Components that define the Product,
keeping in mind the different Specific Subjects that make up the Design Workshop.
-Define a document or report, graphically based, that describes the entire Product chosen and analyzed.

Full-or-part-time: 3h
Theory classes: 3h

DESIGN WORKSHOP PRACTICES. ANLAISI I IMPROVEMENT OF EXISTING PRODUCTS.

Description:
- They will disassemble the chosen Product using the existing tools and supplies in the Design Workshop.
. Physical attributes of the object or Products selected and chosen.
. Analysis of Components and Modules, their relationship with the corresponding justification of the Form-Function.
. Analysis of the different devices that make it up: mechanical, electrical... among others.
. Analysis of Materials and Resistance.
-Creation of a model adjusted to the developed re-Design 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 due to its assessment.

- 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 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 WG members.

Full-or-part-time: 45h
Practical classes: 45h

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 subject of TAD2 are linked to the corresponding percentages on the proposed Projects and which corresponds to the final mark of the subject:

BUSINESS ORGANIZATION ..... -OE 20%
GRAPHIC AND DESIGN ENGINEERING..... -EG 20%
MECHANICAL ENGINEERING..... -EM 20%
ELASTICITY and RESISTANCE OF MATERIALS... -RM by 20%
MATERIALS SCIENCE and ENGINEERING..... -CM by 20%

The Departments that are part of the subject of TAD2 will assess the different Parts that define the Project developed by the Workshop Group and linked to the corresponding Individual Activities (AI) of each student, as well as those of the group, are defined by the sections and percentages next:

NOTE A. EVALUATION in the Definition and Content of the Project.
- GT Project Report..... 10%
- Presentation and Technical Exhibition of the Project... 20%
- Specific Subject Develop..... 40%
- Definition of the Final Model of the GT..... 30%

NOTE B. EVALUATION in Project Management and Monitoring .
In this section, the follow-up 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 Project Management and monitoring can penalize Note A (Project Definition and Content) by up to 20% less, considered based on your individual activity, as well as the group activity. This Grade B affects the final grade of the Project and consequently the overall grade of the subject. The main indicator of this assessment, among others, is the one established in the Rules and Guidelines for the implementation and monitoring of the different Activities and subjects.
The individual activity developed in each specific subject by each student of the WG is the main basis for their evaluation, this activity is projected on the project and other activities of the WG, thus obtaining the individual and final grade .
attendance by the student in the Laboratory or Design Workshops is a necessary condition to pass the subject.
The re-Evaluation according to the academic regulations for Bachelor's and Master's studies of the EPSEVG, in this project-based subject, does not correspond to it.
For the proper functioning and monitoring of the subject, it is necessary to keep in mind the various publications made by the subject manager, as well as by the teachers of the various Specific Subjects of TAD2 on the digital campus (Athenea).

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) on each Project must 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:
- Hudson, Jennifer. Proceso : 50 productos de diseño : del concepto a la fabricación. Barcelona: Blume, 2009. ISBN 9788498013832.
- 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.

Complementary:
- Kalpakjian, Serope; Schmid, Steven R. Manufacturing engineering and technology. 8th ed. Harlow: Pearson Education Limited, 2023. ISBN 9781292422244.