340082 - MEDI-D6O17 - Design Methodology

**Coordinating unit:** 340 - EPSEVG - Vilanova i la Geltrú School of Engineering

**Teaching unit:** 717 - EGE - Department of Engineering Presentation

**Academic year:** 2018

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

BACHELOR'S DEGREE IN MECHANICAL ENGINEERING (Syllabus 2009). (Teaching unit Optional)

**ECTS credits:** 6

**Teaching languages:** Catalan, Spanish

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**Teaching staff**

**Coordinator:** Joan Josep Aliau Pons

**Others:** Joan Josep Aliau Pons
José María Ibañez García

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**Prior skills**

Know and identify:
The manufacturing process according to the geometry, material aspect of the workpiece. Identify impossible geometries depending on the manufacturing process. Teaming up with one common objective. Knowing represent sketch or technical drawing that you want to understand.

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**Requirements**

SOST - Sustainability ......................... - 340001
EXGR - Graphic Expression ..................... - 340024
DIRT - Design and Repres., Technical .... - 340075
TAD1 - Design Workshop I ...................... - 340072
TAD2 - Design Workshop II ..................... - 340076
PRFA - Manufacturing Processes .............. - 340095
DIGR - Graphic Design .......................... - 340080
DIBA - Basic Design ............................. - 304079

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**Degree competences to which the subject contributes**

**Specific:**

1. D.27 Advanced MODELAJE in 3D knowledge.
2. D29. Knowledge of editing and technical documents representation.
6. D37. Ability to recognize changes in society.
7. D38. Ability to identify the language of forms, its values and relation with cultural surroundings.
9. D40. Ability to know and interpret the necessity of the market and user.
10. D41. Control of tools related to design processes.
11. D42. Knowledge of design tools to apply them in design and redesign projects.
12. D49. Ability to analyze and to synthesize bidimensional and tridimensional forms.
14. D53. Ability to associate possibilities to design in each fabrication process.
15. D55. Ability to analyze components and products.
17. D58. Practical knowledge of industrial design methodology.
18. D60. Practical knowledge of design and component and complex product development.
21. G5. Mastery of rendering techniques, spatial design, standardization, computer-aided design, knowledge of fundamentals of industrial design.

**Transversal:**

22. SELF-DIRECTED LEARNING - Level 1. Completing set tasks within established deadlines. Working with recommended information sources according to the guidelines set by lecturers.
23. SELF-DIRECTED LEARNING - Level 2: Completing set tasks based on the guidelines set by lecturers. Devoting the time needed to complete each task, including personal contributions and expanding on the recommended information sources.
24. SELF-DIRECTED LEARNING - Level 3. Applying the knowledge gained in completing a task according to its relevance and importance. Deciding how to carry out a task, the amount of time to be devoted to it and the most suitable information sources.
25. SELF-DIRECTED LEARNING. Detecting gaps in one's knowledge and overcoming them through critical self-appraisal. Choosing the best path for broadening one's knowledge.
26. EFFICIENT ORAL AND WRITTEN COMMUNICATION - Level 1. Planning oral communication, answering questions properly and writing straightforward texts that are spelt correctly and are grammatically coherent.
27. 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.
28. EFFICIENT ORAL AND WRITTEN COMMUNICATION - Level 3. Communicating clearly and efficiently in oral and written presentations. Adapting to audiences and communication aims by using suitable strategies and means.
29. EFFICIENT ORAL AND WRITTEN COMMUNICATION. Communicating verbally and in writing about learning outcomes, thought-building and decision-making. Taking part in debates about issues related to the own field of specialization.
30. SUSTAINABILITY AND SOCIAL COMMITMENT - Level 2. Applying sustainability criteria and professional codes of conduct in the design and assessment of technological solutions.
31. SUSTAINABILITY AND SOCIAL COMMITMENT - Level 3. Taking social, economic and environmental factors into
account in the application of solutions. Undertaking projects that tie in with human development and sustainability.

32. SUSTAINABILITY AND SOCIAL COMMITMENT. Being aware of and understanding the complexity of social and economic phenomena that characterize the welfare society. Having the ability to relate welfare to globalization and sustainability. Being able to make a balanced use of techniques, technology, the economy and sustainability.

33. TEAMWORK - Level 1. Working in a team and making positive contributions once the aims and group and individual responsibilities have been defined. Reaching joint decisions on the strategy to be followed.

34. TEAMWORK - Level 2. Contributing to the consolidation of a team by planning targets and working efficiently to favor communication, task assignment and cohesion.

35. TEAMWORK - Level 3. Managing and making work groups effective. Resolving possible conflicts, valuing working with others, assessing the effectiveness of a team and presenting the final results.

36. TEAMWORK. Being able to work as a team player, either as a member or as a leader. Contributing to projects pragmatically and responsibly, by reaching commitments in accordance to the resources that are available.

### Teaching methodology

- Introduction of each area of knowledge.
- Justification and examples of practical application.
- Class exercises consolidation of content.
- Teamwork

### Learning objectives of the subject

- Know and apply the design process.
- Apply tools related to the design process.
- Identify design tools for application in project design and redesign of products.
- Analyze the impact environmental designed products or design.
- Teaming up with one common objective.
- Being able to make decisions related to product design-redesign.

### Study load

<table>
<thead>
<tr>
<th>Total learning time: 150h</th>
<th>Hours large group:</th>
<th>45h</th>
<th>30.00%</th>
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</thead>
<tbody>
<tr>
<td></td>
<td>Hours medium group:</td>
<td>0h</td>
<td>0.00%</td>
</tr>
<tr>
<td></td>
<td>Hours small group:</td>
<td>15h</td>
<td>10.00%</td>
</tr>
<tr>
<td></td>
<td>Guided activities:</td>
<td>0h</td>
<td>0.00%</td>
</tr>
<tr>
<td></td>
<td>Self study:</td>
<td>90h</td>
<td>60.00%</td>
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</tbody>
</table>
### Content

<table>
<thead>
<tr>
<th>- <strong>Systems of Analysis and Design Synthesis.</strong></th>
<th><strong>Learning time:</strong> 14h</th>
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</thead>
<tbody>
<tr>
<td></td>
<td>Theory classes: 14h</td>
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</tbody>
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**Description:**
Identify the user's perception according to the type of design, the utility, the functionality and the use, and by applying functional tables, analyzing the precedents and referents to establish the design Briefing.

**Related activities:**
From a practical example develop the concepts and knowledge acquired.

**Specific objectives:**
Establish the roadmap that the designer and/or engineer have to do to create and solve the new product.

<table>
<thead>
<tr>
<th>- <strong>Tools Design Methodology.</strong></th>
<th><strong>Learning time:</strong> 30h</th>
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<tbody>
<tr>
<td></td>
<td>Theory classes: 30h</td>
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**Description:**
Enter the eines of:
- Ecodissey
- QFD
- FMEA
- Value Analysis
- SMED
- Poka Yoke
- DFMA

**Related activities:**
Practical exercises and resolution of a product example applied to all the tools explained.

**Specific objectives:**
Apply the tools to optimize the design of the product to be developed with the maximum guarantee.

<table>
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<tr>
<th>- <strong>Industrialization of Products.</strong></th>
<th><strong>Learning time:</strong> 15h</th>
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<tr>
<td></td>
<td>Laboratory classes: 15h</td>
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**Description:**
Apply the tools explained in a practical example to develop in a team.

**Related activities:**
Teamwork with advice during the practical classes.

**Specific objectives:**
Based on the concepts and knowledge acquired, develop a new product by applying the tools to improve its economic viability.
### Qualification system

Reports development and technical report .......... 65%
Defense and technical exhibition project .......... 25%
Rating skills and attitudes ................................. 10%

### Regulations for carrying out activities

Classroom attendance is required of students in at least 90% of the practical sessions and laboratory. There will be a continuous assessment model.

### Bibliography

**Basic:**
