320139 - MD - Design Methodology

Coordinating unit: 205 - ESEIAAT - Terrassa School of Industrial, Aerospace and Audiovisual Engineering
Teaching unit: 717 - EGE - Department of Engineering Presentation
Academic year: 2018
Degree: BACHELOR’S DEGREE IN INDUSTRIAL DESIGN AND PRODUCT DEVELOPMENT ENGINEERING (Syllabus 2010). (Teaching unit Compulsory)
ECTS credits: 6

Teaching languages: Catalan, Spanish

Teaching staff

Coordinator: JOSE LUIS LAPAZ CASTILLO
Others: JOSE LUIS LAPAZ CASTILLO

Opening hours

Timetable: Usual channels for tutoring and meetings:
- E-mail: lapaz@ege.upc.edu
- Virtual Campus ATENEA
- Office phone: +34 937398925
- Office: Escola d'Enginyeria de Terrassa, build TR1, 1.07 (1st floor) - Campus UPC Terrassa

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:
1. DES: Knowledge of the design methodology
2. DES: Capability for analyze, design and project them in design workshops.
3. DES: Practical capability of product redesign
4. DES: Working knowledge of Industrial Design methodology.
5. DES: Capability to know and apply the organization of a creative process

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

<table>
<thead>
<tr>
<th>Total learning time: 150h</th>
<th>Hours large group: 15h</th>
<th>10.00%</th>
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</thead>
<tbody>
<tr>
<td>Hours medium group:</td>
<td>0h</td>
<td>0.00%</td>
</tr>
<tr>
<td>Hours small group:</td>
<td>45h</td>
<td>30.00%</td>
</tr>
<tr>
<td>Guided activities:</td>
<td>6h</td>
<td>4.00%</td>
</tr>
<tr>
<td>Self study:</td>
<td>84h</td>
<td>56.00%</td>
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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.

Learning 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.

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

Learning time: 12h
Theory classes: 3h
Laboratory classes: 9h

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

<table>
<thead>
<tr>
<th>Description:</th>
<th>Learning time: 9h</th>
</tr>
</thead>
<tbody>
<tr>
<td>3.1. Previous conceptual ideas.</td>
<td>Theory classes: 3h</td>
</tr>
<tr>
<td>3.2. The product definition: description, functions and requirements.</td>
<td>Self study: 6h</td>
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<tr>
<td>3.3. Research and market analysis. The needs associated with the product.</td>
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<tr>
<td>3.4. Product specifications: the characteristics and requirements of the product.</td>
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<td>3.5. Design alternatives.</td>
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**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

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

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

<table>
<thead>
<tr>
<th>Description:</th>
<th>Learning time: 4h</th>
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<tbody>
<tr>
<td>4.1. Evaluating alternatives and making decisions.</td>
<td>Theory classes: 1h</td>
</tr>
<tr>
<td>4.2. Evaluation activity designer.</td>
<td>Self study: 3h</td>
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**Related activities:**
- AV41: PRACTICAL EXERCISES OPTIONS ASSESSMENT AND DECISION MAKING
- AV60: PBL INTEGRATED METHODOLOGY & GRAPHICS ENGINEERING

**Specific objectives:**
- CED43: Knowledge of Design Methodology
- CED57: Practical ability to redesign products
A model of continuous assessment for the basic purpose of weighing both self-employment and teamwork of students will apply. Assessing acquisition of knowledge, skills and abilities will be done considering the following weighting (as percentages of the Final Course Note):

<table>
<thead>
<tr>
<th>Oral and written tests:</th>
<th>10%</th>
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<tbody>
<tr>
<td>- AV ( Control 1 )</td>
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<tr>
<td>- AV ( Control 2 )</td>
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<table>
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<tr>
<th>Laboratory:</th>
<th>40%</th>
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<tr>
<td>- Deliveries scheduled AV21 , AV22 , AV23 , AV31 , AV33 , AV34 , AV35 , AV36 , AV37 , AV41 , AV51</td>
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<table>
<thead>
<tr>
<th>Other deliveries:</th>
<th>10%</th>
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<tr>
<td>- AV60 -PBL ( report and public presentation )</td>
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<tr>
<td>- Transversal skill: Teamwork (Level 2)</td>
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For those students who meet the requirements and submit to the reevaluation examination, the grade of the reevaluation exam will replace the grades of all the on-site written evaluation acts (tests, midterm and final exams) and the grades obtained during the course for lab practices, works, projects and presentations will be kept. If the final grade after reevaluation is lower than 5.0, it will replace the initial one only if it is higher. If the final grade after reevaluation is greater or equal to 5.0, the final grade of the subject will be pass 5.0.

### Regulations for carrying out activities

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, ...)

### TOPIC 5: OPTIMIZATION INDUSTRIAL DESIGN PROCESS

<table>
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<th>Learning time: 14h</th>
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<tbody>
<tr>
<td>Theory classes: 9h</td>
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<tr>
<td>Self study : 5h</td>
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</tbody>
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### 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.

### Related activities:

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

### Specific objectives:

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

Basic:


Complementary:


Others resources:

Web Resources (design magazines and blogs):

· Core 77 Design Magazine & Resource. Available at www.core77.com
· Dezeen. Design magazine. Available at www.dezeen.com
· Behance. Online Portfolios. Available at www.behance.net
· Phil Design Studio. Available at www.phildesign.eu
· Coroflot. Design Jobs & Portfolios. Available at www.coroflot.com