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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: 2019

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.

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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

Total learning time: 150h	Hours large group:	15h	10.00%
	Hours medium group:	0h	0.00%
	Hours small group:	45h	30.00%
	Guided activities:	6h	4.00%
	Self study:	84h	56.00%

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Content

TOPIC 1: PRODUCT AND METHODOLOGY DESIGN.

Learning time: 4h

Theory classes: 1h
Laboratory classes: 1h
Self study : 2h

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.

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

Learning time: 12h

Theory classes: 3h
Laboratory classes: 9h

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

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

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

Learning time: 9h

Theory classes: 3h
Self study : 6h

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.

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

Learning time: 4h

Theory classes: 1h
Self study : 3h

Description:
4,1. Evaluating alternatives and making decisions.
4.2. Evaluation activity designer.

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

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TOPIC 5: OPTIMIZATION INDUSTRIAL DESIGN PROCESS	Learning time: 14h Theory classes: 9h Self study : 5h

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

Qualification system

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):

Oral and written tests:
- AV (Control 1) ..... 10 %
- AV (Control 2) 10%

Laboratory:
- Deliveries scheduled AV21 , AV22 , AV23 , AV31 ,
AV33 , AV34 , AV35 , AV36 , AV37 , AV41 , AV51 ..... 40 %

Other deliveries:
- AV60 -PBL (report and public presentation) ..... 10 %.
- Transversal skill: Teamwork (Level 2) 10%

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, ...)

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Bibliography

Basic:

Ulrich, Karl T.; Eppinger, Steven D. Diseño y desarrollo de productos. 5ª ed. México: McGraw-Hill, 2013. ISBN 9786071509444.

Boeijen, Annemiek van [et al.]. Delft design guide: ddesign methods, Delft University of Technology, Faculty of Industrial Design Engineering. 2nd rev. ed. Amsterdam: BIS Publishers, 2014. ISBN 9789063693275.

García Melón, Mónica [et al.]. Metodología del diseño industrial. Valencia: Universidad Politécnica de Valencia, 2001. ISBN 849705024X.

Complementary:

Sanz Adán, Félix; Lafargue Izquierdo, José. 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.

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