Course guide
330535 - PROT - Prototypes

Unit in charge: Manresa School of Engineering
Teaching unit: 750 - EMIT - Department of Mining, Industrial and ICT Engineering.

Degree: BACHELOR'S DEGREE IN AUTOMOTIVE ENGINEERING (Syllabus 2017). (Compulsory subject).

Academic year: 2022 ECTS Credits: 3.0 Languages: Catalan, Spanish, English

LECTURER

Coordinating lecturer: Felipe Blanch, Jose Juan De Niubó Eslava, Maria

Others: Niubó Eslava, Maria Felipe Blanch, Jose Juan De

DEGREE COMPETENCES TO WHICH THE SUBJECT CONTRIBUTES

Specific:
CE18. Knowledge and ability to design prototypes and tests performed on them.

Generical:
CG1. Ability to write and develop projects in the field of automotive engineering for the construction, renovation, repair, maintenance, recycling, manufacture, installation, assembly or operation of: structures, mechanical equipment, energy installations, electrical and electronic installations, plants and industrial plants and manufacturing and automation processes.
CG2. Capacity for management of the activities that are the subject of the engineering projects described in the previous section.
CG4. Ability to solve problems with initiative, decision-making, creativity, critical reasoning and to communicate and transmit knowledge, skills and skills in the field of automotive engineering.
CG5. Knowledge to perform measurements, calculations, valuations, appraisals, appraisals, studies, reports, work plans and the like.
CG6. Ability to handle specifications, regulations and mandatory standards, as well as the specific legislation applicable to this area.
CG7. A capacity for analysing and assessing the social and environmental impact of technical solutions.
CG10. The ability to work in a multilingual and multidisciplinary environment.

Transversal:
1. 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.
2. 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.
3. 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.
4. 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.
06 URI N3. EFFECTIVE USE OF INFORMATION RESOURCES - Level 3. Planning and using the information necessary for an academic assignment (a final thesis, for example) based on a critical appraisal of the information resources used.

Basic:
CB1. Students will be able to demonstrate their knowledge of a field of study that builds on secondary education and is usually found at a level that, while supported by advanced textbooks, also includes aspects that involve knowledge of the latest developments in the field of study.
CB2. Students will be able to apply their knowledge to their work or vocation in a professional manner and demonstrate that they possess the competencies that are typically demonstrated by elaborating and defending arguments and solving problems in the field of study.
TEACHING METHODOLOGY

MD1 Master class or conference (EXP)
MD2 Problem-solving and case study (RP)
MD3 Practical lab work or workshop (TP)
MD5 Project, activity or reduced work (PR)
MD7 Project or broad work (PA)

LEARNING OBJECTIVES OF THE SUBJECT

The subject is intended to provide basic knowledge in the design and creation of vehicle prototypes.

Among the different learning objectives are:
- Know the design process of a vehicle.
- Know and apply prototyping techniques in vehicles

STUDY LOAD

<table>
<thead>
<tr>
<th>Type</th>
<th>Hours</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Self study</td>
<td>45,0</td>
<td>60.00</td>
</tr>
<tr>
<td>Hours small group</td>
<td>15,0</td>
<td>20.00</td>
</tr>
<tr>
<td>Hours large group</td>
<td>15,0</td>
<td>20.00</td>
</tr>
</tbody>
</table>

**Total learning time:** 75 h

CONTENTS

**Title of content 1: Vehicle design concept**

**Description:**
Introduction to the design concept, design process and project of a vehicle. Definitions.

**Specific objectives:**
Understanding of the concept and design process of the vehicle. Understanding the concept of a vehicle project

**Related activities:**
Specific work on content (Activity 1)

**Full-or-part-time:** 5h
Theory classes: 1h
Laboratory classes: 1h
Self study: 3h
### Title of content 2: Conditioning factors and phases of a car project.

**Description:**
Endogenous and exogenous factors: Product requirements, concept search, creativity techniques, generic models for industrial design, shapes and proportions, implementation: materials, finishes, scale. Industrial processes (cost evaluation), evaluation of alternative designs, obtaining the best solution. Phases of a project.

**Specific objectives:**
Understanding, analysis, of the methodology for creating a new product

**Related activities:**
Specific work on content (Activity 2)

**Full-or-part-time:** 40h
- Theory classes: 8h
- Laboratory classes: 8h
- Self study: 24h

### Title of content 3: Project optimization techniques.

**Description:**
Databases. Evaluation of optimal intervals final parameters. Linear regression techniques.

**Specific objectives:**
Understanding, analysis and application of the optimization techniques of a project.

**Related activities:**
Specific work on content (Activity 3)
Final presentation (Activity 4)
Individual test (Activity 5)

**Full-or-part-time:** 30h
- Theory classes: 6h
- Laboratory classes: 6h
- Self study: 18h
ACTIVITIES

Title of activity 1: Vehicle design concept.

Description:
Perform a work on the premises that must be done to start designing a vehicle proposed by the teacher. You must make your public exhibition. (Evaluation of transversal competence "Solvent use of information resources level 3")

Specific objectives:
Development of techniques and reasoning strategies for the analysis
Written and oral communication
Teamwork
Third language
Solvent use of information resources
Social Commitment and Sustainability
Innovation

Material:
In the digital campus "ATENEA"

Delivery:
10 % of the evaluation

Full-or-part-time: 16h
Theory classes: 1h
Self study: 15h

Title of activity 2: Vehicle design process.

Description:
Perform a design work on a vehicle proposed by the teacher. Your public exhibition must be held

Specific objectives:
Development of techniques and reasoning strategies for the analysis
Written and oral communication
Teamwork
Third language
Solvent use of information resources
Social Commitment and Sustainability
Innovation

Material:
In the digital campus "ATENEA"

Delivery:
15 % of the evaluation

Full-or-part-time: 16h
Theory classes: 1h
Self study: 15h
Title of activity 3: Vehicle design optimization.

Description:
Perform a vehicle optimization job designed previously. Your public exposure must be made.

Specific objectives:
Development of techniques and reasoning strategies for the analysis
Written and oral communication
Teamwork
Third language
Solvent use of information resources
Social Commitment and Sustainability
Innovation

Material:
In the digital campus "ATENEA"

Delivery:
20 % of the evaluation

Full-or-part-time: 16h
Theory classes: 1h
Self study: 15h

Title of activity 4: Vehicle design Final presentation.

Description:
Final presentation about project. Your public exposure must be made.

Specific objectives:
Development of techniques and reasoning strategies for the analysis
Written and oral communication
Teamwork
Third language
Solvent use of information resources
Social Commitment and Sustainability
Innovation

Material:
In the digital campus "ATENEA"

Delivery:
30 % of the evaluation

Full-or-part-time: 16h
Theory classes: 1h
Self study: 15h
Title of activity 5: Individual test.

Description:
Individual test

Specific objectives:
Development of techniques and reasoning strategies for the analysis
Third language
Social Commitment and Sustainability
Innovation

Material:
In the digital campus "ATENEA"

Delivery:
25 % of the evaluation

Full-or-part-time: 16h
Theory classes: 1h
Self study: 15h

GRADING SYSTEM

Activity 1: 10% grade
Activity 2: 15% grade
Activity 3: 20% grade
Activity 4: 30% grade
Activity 5: 25% grade

BIBLIOGRAPHY

Basic:

RESOURCES

Other resources:
In the campus "ATENEA"