Course guide
330535 - PROT - Prototypes

Last modified: 08/05/2023

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: 2023 **ECTS Credits:** 3.0 **Languages:** Catalan

LECTURER

Coordinating lecturer: Monclús Anglada, Adrià

Others: Monclús Anglada, Adrià

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 INFORMATI0N 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.
08 GEN. GENDER PERSPECTIVE: An awareness and understanding of sexual and gender inequalities in society in relation to the field of the degree, and the incorporation of different needs and preferences due to sex and gender when designing solutions and solving problems.

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

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 creation process of a prototype.
- Create a real and operative prototype and make all the docmentation.

STUDY LOAD

Type	Hours	Percentage
Hours large group	15,0	20.00
Self study	45,0	60.00
Hours small group	15,0	20.00

Total learning time: 75 h

CONTENTS

Title of content 1: PLANIFICATION

Description:
Creation of objectives, determining necessary resources and budget, organizing work team and setting deadlines.

Specific objectives:
Structuring, planning and creating objectives.

Related activities:
Activity 1 - document delivery

Full-or-part-time: 6h
Theory classes: 1h
Laboratory classes: 2h
Self study : 3h

Title of content 2: DESIGN

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 the requirements and technical specifications given and designing according to the needs of the public and project resources.

Related activities:
Activity 2 - deliver document, 3D design and exhibition and defense

Full-or-part-time: 20h
Theory classes: 2h
Laboratory classes: 3h
Self study : 15h

Title of content 3: MANUFACTURING AND CONSTRUCTION

Description:
Manufacturing and construction

Specific objectives:
Learn rapid manufacturing techniques ideal for prototypes and carry out the actual manufacturing of the prototype

Related activities:
Activity 3 - Workshop work

Full-or-part-time: 26h
Laboratory classes: 5h
Self study : 21h

Content title 1: TEST, EVALUATION AND ITERATION

Description:
Validation tests to verify correct operation and cycles of use. Identification of problems of use and detection of errors and collection of information on weak points and improvement both in operation and in the production process

Specific objectives:
Validation and detection of problems and improvements. Iteration in design and fine-tuning for production.

Related activities:
Activity 4 - Delivery of document and presentation and final defense.
Activity 5 - Functional test and competition.

Full-or-part-time: 31h
Theory classes: 2h
Laboratory classes: 4h
Self study : 25h

ACTIVITIES

Activity 1

Description:
Planning

Specific objectives:
Structuring, planning and creating objectives.

Delivery:
Activity 1 - document delivery (10%)

Related competencies :
CG6. Ability to handle specifications, regulations and mandatory standards, as well as the specific legislation applicable to this area.
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.
06 URI N3. EFFECTIVE USE OF INFORMATI0N 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.
07 AAT N3. 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.
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.
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.

Full-or-part-time: 3h
Theory classes: 1h
Self study: 2h

Activity 2

Description:
Preliminary design + analysis

Specific objectives:
Understanding the requirements and technical specifications given and designing according to the needs of the public and project resources.

Delivery:
Document delivery (5%)
3D design (15%)
Exposure and defense (10%)

Related competencies :
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.
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.
CG6. Ability to handle specifications, regulations and mandatory standards, as well as the specific legislation applicable to this area.
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Full-or-part-time: 9h
Theory classes: 3h
Practical classes: 6h

Activity 3

Description:
Manufacturing and construction.

Specific objectives:
Know rapid manufacturing techniques ideal for prototypes and carry out the actual manufacturing of the prototype.

Delivery:
Workshop work (15%).

Related competencies :
CG5. Knowledge to perform measurements, calculations, valuations, appraisals, appraisals, studies, reports, work plans and the like.
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.
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.
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Full-or-part-time: 26h
Laboratory classes: 5h
Self study: 21h

Activity 4

Description:
Validate operation, detect improvement points and conclusions.

Specific objectives:
Validate operation, detect improvement points and conclusions.

Delivery:
Delivery of document (10%).
Presentation and final defense (20%).

Related competencies :
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.
CG7. A capacity for analysing and assessing the social and environmental impact of technical solutions.
CG2. Capacity for management of the activities that are the subject of the engineering projects described in the previous section.
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.
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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.

Full-or-part-time: 7h 50m
Laboratory classes: 2h
Self study: 5h 50m

Activity 5

Description:
Functional test and competition.

Delivery:
Functional test and competition (15%).

Related competencies :
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.
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.
CE18. Knowledge and ability to design prototypes and tests performed on them.
04 COE N3. 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.

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

GRADING SYSTEM

RESOURCES

Other resources:
In the digital campus "ATENEA"