Course guide
240223 - 240AU063 - Automotive Safety Systems

Last modified: 13/06/2023

Unit in charge: Barcelona School of Industrial Engineering
Teaching unit: 712 - EM - Department of Mechanical Engineering.

Degree: MASTER'S DEGREE IN INDUSTRIAL ENGINEERING (Syllabus 2014). (Optional subject).
MASTER'S DEGREE IN AUTOMOTIVE ENGINEERING (Syllabus 2019). (Compulsory subject).

Academic year: 2023 **ECTS Credits:** 4.5 **Languages:** Spanish

LECTURER

Coordinating lecturer: Moreno Eguilaz, Juan Manuel

Others: Palmieri, David

PRIOR SKILLS

Knowledge of vehicle dynamics and bodywork

REQUIREMENTS

Basic knowlegde in automotive engineering

DEGREE COMPETENCES TO WHICH THE SUBJECT CONTRIBUTES

Specific:
CEAU 1. (ENG) Realitzar models d'enginyeria, aplicar mètodes innovadors en la resolució de problemes i aplicacions informàtiques adequades, per al disseny, simulació, optimització i control de processos i sistemes.
CEAU 3. (ENG) Explicar l'arquitectura d'un vehicle d'automoció, el seu comportament, les seves parts i els sistemes que l'integren.

TEACHING METHODOLOGY

Master classes
Guided autonomous learning
Cooperative learning

LEARNING OBJECTIVES OF THE SUBJECT

General objectives:
Provide generic knowledge about car safety.
Specific objectives:
- Understand the basics of road accident reconstruction.
- Analyze passive security systems.
- Understand the main active security systems and development trends in the coming years.
- Know the main trends in the safety of automated vehicles

STUDY LOAD

Type	Hours	Percentage
Hours medium group	27,0	24.00
Hours small group	13,5	12.00
Self study	72,0	64.00

Total learning time: 112.5 h

CONTENTS

Introduction

Description:
General characteristics of security systems applied to the car

Specific objectives:
- Know the differentiation between active and passive security systems.
- Know the specifics in the fields of active and passive security

Related activities:
Interactive classes and practical examples.

Full-or-part-time: 8h
Theory classes: 3h
Self study : 5h

Reconstruction of accidents

Description:
Main techniques used in road accident reconstruction

Specific objectives:
Know the concepts used in road accident reconstruction: the principle of energy conservation applied to a traffic accident.

Related activities:
Interactive classes, problem solving and practical examples.

Related competencies :
CEAU 1. (ENG) Realitzar models d'enginyeria, aplicar mètodes innovadors en la resolució de problemes i aplicacions informàtiques adequades, per al disseny, simulació, optimització i control de processos i sistemes.

Full-or-part-time: 16h
Theory classes: 6h
Self study : 10h

Passive safety

Description:
Passive security systems.
Shock essay.
Pedestrian protection.

Specific objectives:
Know the main passive security systems.
Interpret the results obtained in the main shock tests.
Know the basics of pedestrian protection.

Related activities:
Interactive classes, problem solving and practical examples.

Related competencies :
CEAU 1. (ENG) Realitzar models d'enginyeria, aplicar mètodes innovadors en la resolució de problemes i aplicacions informàtiques adequades, per al disseny, simulació, optimització i control de processos i sistemes.
CEAU 3. (ENG) Explicar l'arquitectura d'un vehicle d'automoció, el seu comportament, les seves parts i els sistemes que l'integren.

Full-or-part-time: 33h
Theory classes: 12h
Self study : 21h

Automated vehicle safety

Description:
Automated vehicle taxonomy and use cases
Automated Vehicle Safety: Challenges and Benefits

Specific objectives:
Know the main areas of application of automation technologies
Know the concept of verification and validation and the challenges of these processes with the introduction of automated vehicles.

Related activities:
Interactive classes, problem solving and practical examples.

Related competencies :
CEAU 3. (ENG) Explicar l'arquitectura d'un vehicle d'automoció, el seu comportament, les seves parts i els sistemes que l'integren.

Full-or-part-time: 26h 30m
Theory classes: 7h 30m
Self study : 19h

GRADING SYSTEM

The evaluation system is based on three evaluation acts: partial test, final examination and presentation and defense of a work. Both the partial and final exams evaluate theoretical and practical lessons. The work evaluates the theoretical and practical contents as well as the ability to solve real problems and competences such as teamwork, written presentation and oral presentation.
The final grade calculation algorithm is: Nfinal = 0,2NEP + Max [0,8 NEF; 0.6NEF + 0.2NPP] with: NEP: work note; NEF: Final Exam Note; NPP: Partial test grade
The mark of the reevaluation exam will replace the grade of the final exam and the partial exam. The final grade is: Nfinal = 0,2NEP + 0,8NER with NER: reassessment exam note.

RESOURCES

Other resources:
Slides in PDF format (Atenea)