ESCUELA TÉCNICA SUPERIOR DE INGENIERÍA

DEA-OPT-431 Automotive Electronics

SEMESTER: Spring

CREDITS: 3 ECTS (2 hrs. per week: 2 Theory or 2 Lab)

LANGUAGE: English

DEGREES: IEM, ITL, SAPIENS program

Course overview

This course is an introduction to electronic systems found in the automobile industry including navigation, sensoring, interfacing, safety and communication systems. The course focuses on trends in automotive electronics as well as issues (such as production techniques, cost, reliability and system integration) that are driving the industry. Besides, typical applications will be analyzed and experimented in the lab to illustrate solutions to real problems in-situ at Bosch Car-Sensor Factory (Madrid).

Prerequisites

Fundamentals of digital, analog electronics and programming. Fundamentals of control engineering.

Course contents

Theory:

1. Introduction to Automotive Engineering.
2. Fundamentals of Automotive Electronics.
3. Automotive Communications Systems.
4. Sensors and Interfacing.
5. Automotive Control and Power Systems.
6. Automotive Safety: Active and Passive Systems.
7. Driver Assistance Systems.
8. Production Techniques.
9. Automotive Diagnostics Techniques.

Laboratory:

Two experimental lab practice are scheduled (4 hours/session)

P1. Automotive Diagnosis Lab (Bosch factory)
P2. Sensor Fabrication Lines (Bosch factory)

Textbook

- Robert Bosch Gmbh 2013, Bosch Automotive Electrics and Automotive Electronics: Systems and Components, Networking and Hybrid Drive. Publication Date: July 31, 2013 ISBN-13: 978-3658017835. 6th Ed.
- Williams B. Ribbens, 2012. Understanding Automotive Electronics. Seventh Edition, Elsevier

Grading

The following conditions must be accomplished to pass the course:

- Final exam accounts for 40% of the final grade.
- Team work presentation accounts for 30% (includes a research paper with a relevant topic in automotive electronics)
- Lab reports at Bosch are mandatory and graded. They account for 30% of the grade.