ETSIT
Escuela Técnica Superior de
Ingenieros de **Telecomunicación**

Information and communications technology in automotive industry (ICTA)			
Code number:	46675	Number of ECTS:	6 ECTS
Semester:	Autumn	Language:	English

Lecturer(s) and contact:

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Learning goals:

At the end of this sections, the student should be able to:

- Use software tools for the analysis and design of commercial devices and ICT (Information and Communication Technologies) applications in vehicles.
- Analyze and decode traces of basic protocols in vehicles.
- Enumerate and describe the most important parameters of the physical layer of the basic protocols in vehicles.
- Enumerate and describe ICT applications and basic services in vehicles.
- Enumerate and describe basic elements of communications in intra-vehicular, inter-vehicular and vehicle to infrastructure communication networks.
- Design and program applications and devices for intra-vehicular communications.
- Use the documentation from OEM to develop and analyze ICT devices and applications in vehicles.

Contents:

1. Introduction to Vehicle Telematics.
2. Intra-Vehicular communications. CAN Bus.
3. Inttroduction to CANoe.
4. Programming in CAPL.
5. CANoe advanced options for emulating whole systems
6. Intra-vehicular communications. Other standards.
7. Design of ECUs.
8. ECU diagnosis.
9. Dataloggers.

Lab:

1. Physical layer of the CAN bus.
2. CAN analysis: IGN signals, TeleAid Info-Call and Volume Control.
3. CAN analysis: Airbag signals.
4. CAN analysis: Real car trace.
5. Sending CAN messages using CANoe.
6. CAPL Program.
7. Captur Electronic Architecture: Controlling Infotainment from CANoe
8. MOST Optical Bus Analyzer.
9. ECU simulation using CANister. Breathalyzer design and development.
10. Datalogger. Diagnostics.

Prerequisites:

This is an intermediate course, intended for learners with a background in computer and electrical engineering. To succeed in this course, you should have the following knowledge prerequisites:

- Intermediate programming experience, preferable in C.

- Familiarity with protocols, communications networks and telematic services.
- Basic use of laboratory equipment, mainly Oscilloscopes.