



ELECTRONIC ENGINEERING FOR INTELLIGENT VEHICLES

COURSE REFERENT:

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ADMISSION:

Restricted access – selection procedure



The degree programme

The ubiquity of Electronic and Information Technology in today's and tomorrow's vehicles is a mandatory requirement for achieving safer, greener, and more enjoyable drive.

This calls for up-to-date professionals devoted to the development, design, and integration of Electronic and Information Technology subsystems into new generation vehicles.

The aim of the Inter-University Master's Degree in Electronic Engineering for Intelligent Vehicles (EEIV) of the Motor Vehicle University of Emilia Romagna (MUNER) is to train engineers capable of operating in this challenging and exciting field, with specific focus on the understanding of the main Electronic and Communication Systems as well as Autonomous Driving applications.

The Electronic Engineering for Intelligent Vehicles course, entirely taught in English and designed in strong cooperation with MUNER companies operating in the automotive sector, is organized in two curricula, each one of which open to 25 students: Electronic and Communication Systems (ECS) and Autonomous Driving Engineering (ADE).

The syllabus has been designed in strong cooperation with MUNER Companies operating in the automotive sector to allow seamless insertion of the EEIV graduate in high-profile roles in the research, development, and manufacturing environments focused on vehicles and automotive technologies.



After graduation

The Graduate in Electronic Engineering for Intelligent Vehicles will have a multidisciplinary training allowing to understand, propose and adapt what is developed in the flourishing field of Information and Communication Technologies, playing a key role in the innovation of the automotive sector, the future evolution of which will increasingly depend on these technologies.

Based also on the chosen curriculum the Graduate will:

Electronic and Communication System (ECS): understand the operating principles and design constraints of the fundamental electronic and communication devices and subsystems as well as how they can be controlled and securely connected with each other and the surrounding environment in automotive and motorbike applications.

Autonomous Driving Engineering (ADE): be able to deal with concepts, methods and architectures used to enable advanced driver assistance systems up to fully autonomous driving. They will be able to participate in concept development, design requirements, and operating strategies to provide for vehicle functionality and end-user safety, and intelligent transportation systems based on perception devices, intelligent algorithms and methods, and planning and control strategies.



WHERE WE ARE

Parco Area delle Scienze, 181/A



cdlm-eeiv.unipr.it





STUDY PLAN



FIRST YEAR

Common for ECS and ADE (Taught in Bologna)

Mandatory

- ADVANCED AUTOMOTIVE SENSORS 6
- HARDWARE-SOFTWARE DESIGN OF EMBEDDED SYSTEMS I.C. 12
- AUTOMATIC CONTROL 6

Guided choice elective courses

- POWER ELECTRONICS FOR AUTOMOTIVE 6
- TEST, DIAGNOSIS AND RELIABILITY 6
- STATISTICAL SIGNAL PROCESSING 6

ECS curricula (Taught in Bologna)

Mandatory

- SIGNALS AND SYSTEMS FOR VEHICULAR COMMUNICATIONS 6
- WIRED AND WIRELESS INTERCONNECTIONS 9

Guided choice elective courses

- DYNAMICS AND COMPLIANT DESIGN OF ROAD VEHICLES 6
- DEEP LEARNING FOR ENGINEERING APPLICATIONS 6

Guided choice elective courses

- GROUND VEHICLE DYNAMICS 3
- LAB OF REAL-TIME OPERATING SYSTEMS 3
- CONNECTED VEHICLES 3

ADE curricula (Taught in Bologna)

Mandatory

- IMAGE PROCESSING AND COMPUTER VISION 6
- VEHICULAR RADIO PROPAGATION 9
- DEEP LEARNING FOR ENGINEERING APPLICATIONS 6

CFU

24

6

12

6

12

6

6

6

15

6

9

6

6

6

3

3

3

3

21

6

9

6



COMPUTER ARTIFICIAL INTELLIGENCE ELECTRONICS AND LIGHTING 3D PERCEPTION

SECOND YEAR	CFU
ECS curricula (Taught in Modena)	
Mandatory	12
• APPLIED TOPICS IN AUTOMOTIVE ELECTRONICS	12
Guided choice elective courses	12
• ARTIFICIAL INTELLIGENCE FOR AUTOMOTIVE	6
• AUTOMOTIVE CONNECTIVITY	6
• AUTOMOTIVE CYBER SECURITY	6
• INDUSTRIAL CO-TEACHING	6
• MODELING AND CONTROL OF ELECTROMECHANICAL SYSTEMS	6
• PLATFORMS AND ALGORITHMS FOR AUTONOMOUS DRIVING	6
ADE curricula (Taught in Parma)	
Mandatory	15
• ELECTRONICS AND LIGHTING TECHNOLOGIES FOR AUTOMOTIVE	12
• COMPUTER ENGINEERING LABORATORY	3
Guided choice elective courses	12
• 3D PERCEPTION, LEARNING-BASED DATA FUSION	6
• AUTONOMOUS DRIVING AND ADAS TECHNOLOGIES	6
• PATH AND TRAJECTORY PLANNING	6
• VEHICULAR COMMUNICATIONS	6
• VIRTUAL SYSTEMS AND HUMAN MACHINE INTERFACE	6
• VISUAL PERCEPTION FOR SELF-DRIVING CARS	6
Common for ECS and ADE	
• FREE CHOICE COURSES	12
• FINAL EXAMINATION WITH OPTIONAL INTERNSHIP	24