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WHY STUDY WITH US?
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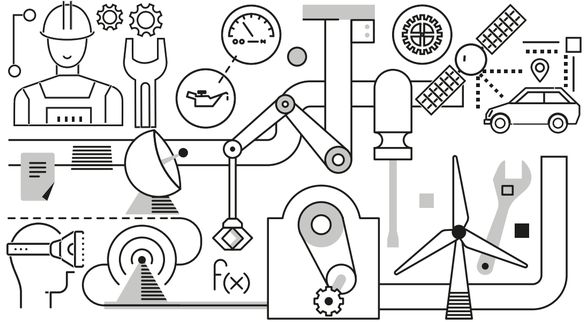
Edizione marzo 2021

ACADEMIC YEAR 2021/2022

TWO-YEAR SECOND-CYCLE DEGREE 2 years

ADVANCED AUTOMOTIVE ENGINEERING



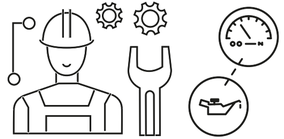
UNIVERSITÀ DI PARMA
ALMA MATER STUDIORUM UNIVERSITÀ DI BOLOGNA
UNIVERSITÀ DEGLI STUDI DI FERRARA - EX LABORE FRUCTUS -
UNIMORE

UNIVERSITÀ DI PARMA

ADVANCED AUTOMOTIVE ENGINEERING

WHY PARMA?

This Master's Degree course in Advanced Automotive Engineering, aims to offer all the skills needed to design and develop high performance cars and motorcycles. It's promoted by MUNER (Motorvehicle University of Emilia-Romagna), an association founded by the Emilia Romagna Region and through collaboration between the universities in the area, including the University of Parma, and some of the most prestigious Italian companies in the sector such as Lamborghini, Dallara, Ducati, Ferrari, Haas F1 team, HPE Coxa, Marelli, Maserati, Alpha Tauri and Pagani.
This Master's Degree course in AAE, offered exclusively in English, is made up of 6 different syllabuses with 25 places available for each one.
Advanced Powertrain – Modena (Modena), Advanced Powertrain Bologna(Bologna in the 2nd Semester); High Performance Car Design (Parma in the second year); Advanced Motorcycle Engineering (Bologna) ; Advanced Sportcar Manufacturing (Bologna).
One of the strengths of this course is the synergy created through academic activities accompanied by significant contributions from qualified technical staff from the industrial sector, internships with partner companies and visits to some of the most important companies within the sector.



WHAT ARE YOU GOING TO LEARN?

PRIMO ANNO

CFU

PRIMO SEMESTRE COMUNE - MODENA

- MANUFACTURING AND ASSEMBLY TECHNOLOGIES/SCIENCE AND TECHNOLOGY OF METALLIC AND COMPOSITE MATERIALS 12
- MECHANICAL VIBRATIONS 6
- VEHICLE CONCEPTUAL DESIGN 6

SECONDO SEMESTRE

***ADVANCED POWERTRAIN* - MODENA**

- INTERNAL COMBUSTION ENGINES 6
- ELECTRIC DRIVES 6
- AUTOMATIC CONTROLS 6
- ENGINE COMPONENTS DESIGN AND MANUFACTURING / AUTOMOTIVE COMPUTER AIDED 12
- MECHANICAL TRANSMISSIONS 6

***ADVANCED POWERTRAIN* - BOLOGNA**

- ELECTRIC DRIVES/ELECTRIC PROPULSION SYSTEMS 12
- ELECTRONICS SYSTEMS/AUTOMATIC CONTROLS 12
- POWERTRAIN DESIGN AND MANUFACTURING 6
- INTERNAL COMBUSTION ENGINES 6

***HIGH PERFORMANCE CAR DESIGN* - MODENA**

- CFD FUNDAMENTALS AND AERODYNAMICS 9
- FEM FUNDAMENTALS AND CHASSIS DESIGN 9
- VEHICLE DYNAMICS 12
- AUTOMOTIVE COMPUTER AIDED DESIGN 6
- AUTOMATIC CONTROLS 6

***RACING CAR DESIGN* - MODENA**

- CFD FUNDAMENTALS AND AERODYNAMICS 9
- FEM FUNDAMENTALS AND CHASSIS DESIGN 9
- VEHICLE DYNAMICS 12
- AUTOMOTIVE COMPUTER AIDED DESIGN CAD 6

***ADVANCED MOTORCYCLE ENGINEERING* - BOLOGNA**

- POWERTRAIN DESIGN AND MANUFACTURING 6
- ELECTRONICS SYSTEMS /AUTOMATIC CONTROLS 12
- ELECTRIC DRIVES/INTERNAL COMBUSTION ENGINES 12

***ADVANCED SPORTCAR MANUFACTURING* - BOLOGNA**

- POWERTRAIN DESIGN AND MANUFACTURING 6
- ELECTRONICS SYSTEMS /AUTOMATIC CONTROLS 12
- ELECTRIC DRIVES / INTERNAL COMBUSTION ENGINES 12

SECONDO ANNO

CFU

***ADVANCED POWERTRAIN* - MODENA**

- DESIGN AND MODELLING OF HIGH PERFORMANCE COMBUSTION SYSTEMS 12
- ELECTRIC PROPULSION SYSTEMS/ELECTROCHEMICAL ENERGY STORAGE AND CONVERSION 12
- A SCELTA 12
- TESI 12
- TIROCINIO E/O LABORATORIO 12

***ADVANCED POWERTRAIN* - BOLOGNA**

- MODELING AND CONTROL OF INTERNAL COMBUSTION ENGINES AND HYBRID PROPULSION SYSTEMS/ADVANCED COMBUSTION SYSTEMS 12
- ELECTROMECHANICAL ENERGY STORAGE AND CONVERSION 6 - POWERTRAIN TESTING, CALIBRATION AND HOMOLOGATION 6
- A SCELTA 12
- TESI 12
- TIROCINIO E/O LABORATORIO 12

***HIGH PERFORMANCE CAR DESIGN* - MODENA**

- VEHICLE NVH TESTING 6
- AUTOMOTIVE ELECTRONIC SYSTEMS 6
- AUTOMOTIVE FLUID POWER SYSTEMS 6
- A SCELTA 12
- TESI 12
- TIROCINIO E/O LABORATORIO 12

***RACING CAR DESIGN* - PARMA**

- CHASSIS AND BODY DESIGN 6
- DESIGN OF RACING CAR COMPOSITE STRUCTURES 6
- DYNAMIC TESTING OF VEHICLES 6
- INDUSTRIAL AERODYNAMICS 6
- A SCELTA 12
- TESI 12
- TIROCINIO E/O LABORATORIO 12

***ADVANCED MOTORCYCLE ENGINEERING* - BOLOGNA**

- MODELING AND CONTROL OF INTERNAL COMBUSTION ENGINES AND HYBRID PROPULSION SYSTEMS 6
- CHASSIS AND BODY DESIGN AND MANUFACTURING / VEHICLE VIRTUAL DESIGN 12
- MOTORCYCLE VEHICLE DYNAMICS 6
- POWERTRAIN TESTING, CALIBRATION AND HOMOLOGATION 6
- A SCELTA 12
- TESI 12
- TIROCINIO E/O LABORATORIO 12

***ADVANCED SPORTCAR MANUFACTURING* - BOLOGNA**

- INDUSTRIAL PLANTS DESIGN 6
- INDUSTRIAL ROBOTICS 6
- OPERATIONS & SUPPLY CHAIN DESIGN AND MANAGEMENT/AUTOMOTIVE MANUFACTURING AND ASSEMBLY SYSTEMS 12
- ALGORITHMS AND SYSTEMS FOR BIG DATA PROCESSING 6
- A SCELTA 12
- TESI 12
- TIROCINIO E/O LABORATORIO 12

WHAT TO EXPECT AFTER THE COURSE

The Advanced Automotive Engineering graduate is a professional who has an understanding of the industrial aspects of the business and, through their global vision of the various systems within the vehicle, can design, develop and produce the main subsystems for road vehicles, both automobiles and motorcycles, with particular attention being paid to luxury and competition vehicles. Depending on the syllabus followed, the professional profile of the Advanced Automotive Engineer is specialized in:

- **Advanced Powertrain**: Focused on the design and engineering of propulsion systems, both innovative and traditional, particular attention being paid to optimization, control and resolving issues regarding the environment and energy.
- **High Performance car Design**: Starting from an in-depth understanding of the fundamentals, the focus is on the development of vehicle systems and the design of all the main "cold" systems and sub-systems for high performance road vehicles.
- **Racing Car Design**: Focused on setting up the vehicle systems and designing all the "cold" systems and subsystems for competition vehicles. It is characterized by the particular emphasis on aerodynamic aspects, the use of light materials (Carbon Fibre Reinforced Materials) and the skills needed to experiment and invent tomorrow's technologies.
- **Advanced Motorcycle Engineering**: Focused on the design and development of high-tech motorcycles, both for the competition and production markets, managing typical Electronic Engineering and Industrial Design issues in the motorcycle sector.
- **Advanced Sportcar Manufacturing**: Focused on planning, developing, controlling and managing processes and production systems in the automobile sector with particular emphasis on the use of cutting-edge digital technologies.

GENERAL INFORMATION

ORIENTATION

PROF. GIANNI NICOLETTO gianni.nicoletto@unipr.it

ADMISSION

Places available: 120
For more info: www.aae.unimore.it

DEPARTMENT

Engineering and Architecture - dia.unipr.it
Parco Area delle Scienze, 181/A - Campus Universitario
MUNER - (Motorvehicle University of Emilia-Romagna) - motorvehicleuniversity.com/en/

TYPE AND DURATION

2-year Master's Degree

DEGREE CLASS

LM-33 Master's Degree in Mechanical Engineering