PHD PROGRAMME TABLE 38TH CYCLE

Section "Available Positions and Scholarships" integrated on 13/05/2022

Section "Available Positions and Scholarships" modified on 26/05/2022

Section "Available Positions and Scholarships" modified on 27/05/2022

PROGRAMME'S NAME	**AUTOMOTIVE ENGINEERING FOR INTELLIGENT MOBILITY**
ASSOCIATED PARTNERS *Pursuant to art. 3 para 2 lett. a) of the MD n. 226/2021*	Università degli Studi di Modena e Reggio Emilia Università degli Studi di Parma
DURATION	3 years
PROGRAMME START DATE	01/11/2022 (DD/MM/YYYY)
LANGUAGES	English
MANDATORY STAY ABROAD	3 months
COORDINATOR	Prof. Nicolò Cavina (nicolo.cavina@unibo.it)
CURRICULA	1. Vehicle Design, Manufacturing and Systems Integration 2. Energy Systems, Powertrains, Vehicle Performance 3. Vehicle Informatics and Connectivity
RESEARCH TOPICS	Detailed list at the bottom of the present document
PhD POSITIONS	12
ADMISSION PROCEDURE	Qualifications and research proposal evaluation Oral examination

Available Positions and Scholarships

Pos. n.	Financial Support	Description	Curriculum	Positions linked to research topics
1	PhD Scholarship	Funded by the University of Bologna general budget and co-funded by the Department of Industrial Engineering	2	Development of advanced multibody models for the analysis and optimization of road and off-road vehicle dynamics
2	PhD Scholarship	Funded by the University of Bologna general budget and co-funded by the Department of Industrial Engineering	1	Development of structural design and assessment tools for innovative components and joints to be applied in the automotive field
3	PhD Scholarship	Funded by the University of Bologna general budget and co-funded by the Department of Industrial Engineering	1	Models, methods and smart tools for manufacturing and assembly within "Automotive Industry 4.0"
4	PhD Scholarship	~~Funded by the University of Bologna general budget and co-funded by the Department of Electrical, Electronic, and Information Engineering "Guglielmo Marconi"~~ Totally funded by the University of Bologna general budget	3	Electronic components and systems for intelligent and connected vehicles
5	PhD Scholarship	Funded by Università di Parma	3	Embedded Systems for autonomous driving
6	PhD Scholarship	Funded by Università di Parma	2	Energy management in electric/hybrid vehicles

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7	PhD Scholarship	Funded by Università di Modena e Reggio-Emilia	1	Innovative sustainable design approaches and efficient production systems for the automotive sector
8	PhD Scholarship	Funded by Università di Modena e Reggio-Emilia	2	Innovative Solutions for Sustainable Power Units
9	PhD Scholarship	Funded by Università di Modena e Reggio-Emilia	3	Vehicle motion planning and control in presence of human road users
10	Research Grant	Provided by the Department of Electrical, Electronic, and Information Engineering "Guglielmo Marconi" with funds made available by H2020 BONSAPPS (GA 101015848) ref. prof. Luca Benini. The research gran twill have a duration of 12 months, renewable up to 36 months and gross percipient amount of €19367	3	Development of AI-based smart HMIs for advanced driver security
11	Research Grant	Funded by Università di Modena e Reggio-Emilia and provided by the Department of Electrical, Electronic, and Information Engineering "Guglielmo Marconi". The research gran twill have a duration of 12 months, renewable up to 36 months and gross percipient amount of €19367	2	Innovative Hybrid/electric powertrain architectures for vehicle applications
12	PhD Scholarship	Funded by the University of Bologna general budget and co-funded by the Department of Industrial Engineering	2	Analysis and advanced modeling of phenomena and technologies related to the implementation of new propulsion systems and fuels to reduce the CO_2 emissions

Admission Exams

	DATE AND TIME	RESULTS
Qualifications and research proposal evaluation	Applicants' participation is not required	Available from **15/06/2022****
Oral examination	**Date**: starting from **04/07/2022** – 9.00 a.m. CEST* **Place**: Remotely, using Microsoft Teams	Available from **08/07/2022****

* In case that the oral examination cannot be completed in one day due to the large number of applicants, the oral examination detailed schedule shall be made available on the webpage Studenti Online together with the results of the qualifications and research proposal evaluation. **During the oral examination, applicants may express their interest in one or more positions linked to specific research topics.**

** The **results of the admission exams** will be available on the webpage Studenti Online (select "summary of the requests in progress" > "see detail" and open the .pdf file at the bottom of the page). **No personal written communication will be sent to applicants concerning the examinations results**.

Required and Supporting Documents to be attached to the application

All the documents listed below **shall be drawn up in English or in Italian**. In case of documents originally issued in any other language (e.g. identity document, qualifications), an official English translation is required.

Only qualifications obtained **during the last 5 calendar years** shall be taken into consideration, except for the University Degree. The Admission Board will assess the relevance of the supporting documents to the PhD Programme.

REQUIRED DOCUMENTS	
Identity document	Valid identity document with photo (i.e. identity card, passport)
Curriculum Vitae	No specific CV format is required
Degrees	Documents attesting the awarding of the first and second cycle degrees, the exams taken and the marks obtained (see Art. 3 of the Call for Applications)
Research proposal	Multi-annual research proposal, with special emphasis on the **activities to be completed during the first-year course**. The proposal must meet the following requirements: - it must **mention on the cover page the main research topic** the applicant is interested to and the proposal is about; - **it cannot exceed 20,000 characters**, including spaces and formula possibly used. This figure does not include: the title of proposal, the outline, references and images (such as graphs, diagrams, tables, etc. - if present); - **it must include**: the state of the art; description of the proposal; expected results; references.
SUPPORTING DOCUMENTS	
Thesis abstract	Abstract of the **second cycle degree thesis.** Graduands applicants may submit the draft of the thesis. Abstracts cannot exceed 5,000 characters, including spaces and formula possibly used. The above figure does not include: the title of the thesis, the outline, references, and images such as graphs, diagrams, tables etc.
Publications	Lists of publications (i.e. monographs, articles on scientific journals), minor publications (conference papers, etc.), abstracts and posters presented during national and international conferences, etc.
Other documents	- Postgraduate vocational training programmes relevant to the PhD Programme main research topics - Teaching activities carried out at university level - Research activity of any kind - whether basic, applied, translational, etc. - carried out in any capacity, including when covered by research grants, and as a staff member of research projects - Documents attesting the knowledge of foreign languages - Study periods completed by applicants outside their countries of origin (e.g. Erasmus programme or other similar mobility programmes) - Other qualifications attesting the suitability of the applicants (scholarships, prizes, etc.)

Evaluation criteria*

Scores will be expressed in points out of 100, as follows.

1. Qualifications and research proposal evaluation

Minimum score for admission to the oral examination: 30 points, Maximum score: 50 points

Qualifications evaluation	Second cycle (Master's) degree final mark. Graduands shall be evaluated according to the Weighted Average Mark (WAM)	20 points max
	Publications and other qualifications attesting the applicant's training and skills	5 points max
Research proposal evaluation	Scientific value and ground-breaking nature of the proposal	15 points max
	Structure of the proposal	5 points max
	Proposal feasibility	5 points max

2. Oral examination

Minimum score for eligibility: 30 points, Maximum score 50 points

Foreign language proficiency	5 points max
Research proposal presentation	30 points max
General knowledge of issues encompassed by the PhD Programme	15 points max

Oral examination aims to assess the suitability of the applicant for scientific research as well as the general knowledge of issues encompassed by the PhD Programme (see the list of research topics at the bottom of the present document).

The oral examination is carried out in English.
* Possible further evaluation criteria will be available on the [University website](#), selecting the relevant PhD Programme > "More information", at the bottom of the page in the section "Notices".

Research Topics

Curriculum 1: Vehicle Design, Manufacturing and Systems Integration
The curriculum pursues the education of researchers and high-qualified engineers, operating in the areas of design and manufacturing of the automotive sector, and able to address issues related to design and research activities in disciplines such as:
- Industry 4.0 and Advanced Manufacturing Technologies
- Supply Chain Management
- Industrial Automation and Robotics
- Big Data and Cloud Computing for Manufacturing
- Materials, Lighting Technology and Design Methods for improving Efficiency and Safety of Vehicles
- Vehicle Lifecycle Assessment. Circular Economy: Vehicle refurbish, re-use of Vehicle Parts**.**

Curriculum 2: Energy Systems, Powertrains, Vehicle Performance
The curriculum pursues the education of researchers and high-qualified engineers, operating in the areas of vehicle dynamics and energy management, and able to address issues related to design and research activities in disciplines such as:
- Electrification and Power Electronics
- Electric, Hybrid and ICE-based Powertrains
- Advanced Combustion and Aftertreatment Systems
- Batteries and Energy Storage Systems
- Vehicle Energy Management and Energy Optimization
- Vehicle Dynamics and Control

Curriculum 3: Vehicle Informatics and Connectivity
The curriculum pursues the education of researchers and high-qualified engineers, operating in the areas of vehicle digitalization and connectivity, and able to address issues related to design and research activities in disciplines such as:
- Vehicle Human Machine Interface and Infotainment systems
- Gamification for Improving Driver Behavior
- Vehicular networks, Vehicular Sensors and Big Data for Mobility
- Automatic and Autonomous Drive
- Connectivity for V2I - Vehicle to Infrastructure, V2V - Vehicle to Vehicle and V2G - Vehicle to smart Grid interfacing
- Data Analytics and Advanced Prediction Models