ALMA MATER STUDIORUM
UNIVERSITÀ DI BOLOGNA | AREA
FORMAZIONE E DOTTORATO

# PHD PROGRAMME TABLE 40TH CYCLE

Section "Available Positions and Scholarships" integrated on 10/06/2024

| PROGRAMME'S NAME | AUTOMOTIVE ENGINEERING FOR INTELLIGENT MOBILITY |
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| 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 | 01/11/2024 (DD/MM/YYYY) |
| LANGUAGES | English |
| 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 |
| PhD POSITIONS | 11 |
| 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 by the Department of Industrial Engineering | 2 | Development and implementation of predictive engine models for the control and simulation of high-performance hybrid powertrains powered by traditional, synthetic fuels and hydrogen |
| 2 | *PhD scholarship* | Funded by the University of Bologna general budget, by the Department of Industrial Engineering and by the Department of Electrical, Electronic, and Information Engineering "Guglielmo Marconi" | 2 | Advanced computational methods for the optimization of the energy management in new powertrain solutions |
| 3 | *PhD scholarship* | Funded by the University of Bologna general budget and by the Department of Industrial Engineering | 2 | Advanced digital twins for the analysis and optimization of road and off-highway vehicle dynamics |
| 4 | *PhD scholarship* | Funded by the University of Bologna general budget and by the Department of Industrial Engineering | 1 | Innovative solutions for the design and management of |

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| | | | | automotive production systems and for intelligent mobility |
| 5 | *PhD scholarship* | Totally funded by the University of Bologna general budget | 3 | Vehicular connectivity for cooperative maneuvres |
| 6 | *PhD scholarship* | Funded by Università di Parma | 1 | Design of lightweight structures against multiaxial non-proportional fatigue |
| 7 | *PhD scholarship* | Funded by Università degli Studi di Modena e Reggio Emilia | 3 | Bidirectional Human car interaction for safety. Analysis of vital signs and physiological parameters to monitor driver's state |
| 8 | *PhD scholarship* | Funded by Università degli Studi di Modena e Reggio Emilia | 1 | Engineering methodologies: design, materials, and manufacturing practices that impact sustainable mobility and automotive |
| 9 | *PhD scholarship* | Funded by the EU - NextGenerationEU with funds made available by the National Recovery and Resilience Plan (NRRP) CN MOBILITY, Code CN00000023, CUP J33C22001120001 | 2 | Optimization and forecast algorithms with application to layout and energy management of a Fuel Cell based powertrain |
| 10 | *PhD scholarship* | Funded by the EU - NextGenerationEU with funds made available by the National Recovery and Resilience Plan (NRRP) CN MOBILITY, Code CN00000023, CUP J33C22001120001 | 3 | AI algorithms for residual life estimation on battery fleets |
| 11 | *Research Grant* | Provided by the Department of Electrical, Electronic, and Information Engineering "G. Marconi" with funds made available by the project H2020-JTI-EuroHPC-2020-01 - The European PILOT "Pilot using Independent Local & Open Technologies" (ref. Prof. Davide Rossi) GA 101034126 CUP B22C22000230008. The research grant will have a duration of months, renewable up to 36 months, and gross percipient amount of €21,888.34 per year. | 3 | RISC-V Based High-Performance Computing for AI-based Human Machine Interaction in Automotive Applications |

The number of positions and scholarships may be incremented in case additional funding becomes available, notwithstanding the terms of the application process in the Call. Any amendment, update or integration of the Programme Table will be published on the University website, even after the Call for applications has expired. Any further PhD positions shall be integrated in the PhD Programme Table within ten days before the oral examination.

All PhD positions winners shall fulfill the learning and research obligations decided by the Academic Board and the obligations foreseen in the relevant regulations, funding schemes and eventual agreements, and in the Call for Applications.

## Admission Exams

| | DATE AND TIME | RESULTS |
|---|---|---|
| **Qualifications and research proposal evaluation** | Applicants' participation is not required | Available from **22/06/2024** |

| Oral examination | **Date**: starting from **12/07/2024 – 9.00 a.m. CEST**<br>**Place**: In presence, Department of Industrial Engineering, Viale del Risorgimento 2, Bologna. Remotely, using Microsoft Teams | Available from **15/07/2024** |

The results of the qualifications and research proposal evaluation shall 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) together with the oral examination detailed schedule. **No personal written communication will be sent to applicants concerning the examinations results**.

**During the oral examination, applicants may express their interest in one or more positions linked to specific research topics.**

## 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 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 | |
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| **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:<br>- it must **mention on the cover page the Curriculum and the main research topic** the applicant is interested to and the proposal is about;<br>- **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);<br>- **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<br>- Teaching activities carried out at university level<br>- 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<br>- Documents attesting the knowledge of foreign languages<br>- Study periods completed by applicants outside their countries of origin (e.g. Erasmus programme or other similar mobility programmes)<br>- 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

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| Foreign language proficiency | 5 points max |
| Research proposal presentation | 30 points max |
| General knowledge of the PhD programme's main research topics and of the research topics linked to the available PhD positions | 15 points max |

Oral examination aims to assess the suitability of the applicant for scientific research as well as the general knowledge of the PhD programme's main research topics and of the research topics linked to the available PhD positions.

**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".