



ALMA MATER STUDIORUM  
UNIVERSITÀ DI BOLOGNA

AREA  
FORMAZIONE E DOTTORATO

## PHD PROGRAMME TABLE 40TH CYCLE

Section "Available Positions and Scholarships" integrated on 27/05/2024

Section "Available Positions and Scholarships" integrated on 03/06/2024


Sections "Available Positions and Scholarships" and "Admission Exams" integrated on 11/06/2024

Section "Available Positions and Scholarships" integrated on 14/06/2024

PROGRAMME'S NAME	MECHANICS AND ADVANCED ENGINEERING SCIENCES (DIMSAI)
DURATION	3 years
PROGRAMME START DATE	01/11/2024 (DD/MM/YYYY)
LANGUAGES	Italian, English
COORDINATOR	Prof. Lorenzo Donati ( <a href="mailto:l.donati@unibo.it">l.donati@unibo.it</a> )
CURRICULA	<ol style="list-style-type: none"><li>1. Engineering and Industrial Design, Machine Construction, Metallurgy, and Manufacturing Technologies</li><li>2. Fluid Machinery, Energy Systems, Mechanics of Machines, and Industrial Mechanical Plants</li><li>3. Thermal Physics, HVAC Systems, Acoustics, Nuclear Technologies and Industrial Applications of Plasmas</li></ol>
PhD POSITIONS	17
ADMISSION PROCEDURE	Qualifications and research proposal evaluation Oral examination

### Available Positions and Scholarships

Pos. n.	Financial Support	Description	Curriculum	Positions linked to a specific research topic
1	<b>PhD scholarship</b>	Funded by the University of Bologna general budget and by the Department of Industrial Engineering	1	
2	<b>PhD scholarship</b>	Funded by the University of Bologna general budget and by the Department of Industrial Engineering with funds made available by the project PRIN 2022 3DSHYMCO Ref. Prof. Zucchelli CUP J53D23002470006	1	
3	<b>PhD scholarship</b>	Funded by the University of Bologna general budget and by the Department of Industrial Engineering with funds made available by the project PRIN 2022PNRR POWHER, CUP J53D23015750001, Ref. Prof. Lisa Branchini	2	

4	<b>PhD scholarship</b>	Funded by the University of Bologna general budget and by the Department of Industrial Engineering with funds made available by the project PRIN 2022PNRR POWHER, CUP J53D23015750001, Ref. Prof. Lisa Branchini, and with funds made available by the Agreement CNR-ITAE	2	
5	<b>PhD scholarship</b>	Funded by the University of Bologna general budget and by the Department of Industrial Engineering	2	
6	<b>PhD scholarship</b>	Funded by the University of Bologna general budget and by the Department of Industrial Engineering	2	
7	<b>PhD scholarship</b>	Funded by the University of Bologna general budget and by the Department of Industrial Engineering	3	
8	<b>PhD scholarship</b>	Funded by the University of Bologna general budget and by the Department of Industrial Engineering	3	
9	<b>PhD scholarship</b>	Funded by the University of Bologna general budget and by the Department of Industrial Engineering	3	
10	<b>PhD scholarship</b>	Funded by the EU - NextGenerationEU with funds made available by the National Recovery and Resilience Plan (NRRP) - CN MOBILITY, Code CN00000023, CUP J33C22001120001 (Prof. Nicolò Cavina) 	1	Innovative metals for high strength-to-weight components
11	<b>Research Grant</b>	Provided by the Interdepartmental Centre for Industrial Research in Advanced Mechanical Engineering Applications and Materials Technology - CIRI Advanced Mechanics and Materials with funds made available by the programme PR FESR – Action 1.1.2 – Call for strategic industrial research projects addressing priority areas of the Intelligent Specialisation Strategy (DGR 2097/2022) – Project “SiMOD – Sistemi Mobili Multi-robot per la Manipolazione di Oggetti Deformabili” – CUP J47G22000830003 – Ref.: Prof. Marco Carricato. The research grant will have a duration of 12 months, renewable up to 36 months, and gross percipient amount of €20,266.98 per year.	2	Strategies of optimal robotic comanipulation of complex objects
12	<b>PhD scholarship</b>	Funded by the University of Bologna general budget and by the Department of Industrial Engineering	2	Artificial intelligence algorithms for modelling, monitoring and control of complex structures and mechatronic systems
13	<b>PhD scholarship</b>	Funded by ENEA - Agenzia Nazionale per le Nuove Tecnologie, l'Energia e lo Sviluppo Sostenibile	3	Development of Beam Intercepting Devices (BID) in liquid metals
14	<b>Research Grant</b>	Provided by the Department of Industrial Engineering. The research grant will have a duration of 12 months, renewable up to 36 months, and gross percipient amount of €19,367.00 per year.	3	Manufacturing functional surfaces through the combination of atmospheric pressure non-equilibrium plasma deposition and laser texturing

15	<b>PhD scholarship</b>	Funded by ENEA - Agenzia Nazionale per le Nuove Tecnologie, l'Energia e lo Sviluppo Sostenibile - Dipartimento Tecnologie Energetiche e Fonti Rinnovabili	3	Reliability analysis of passive safety systems in SMR reactors
16	<b>PhD scholarship</b>	Funded by ENEA - Agenzia Nazionale per le Nuove Tecnologie, l'Energia e lo Sviluppo Sostenibile - Dipartimento Tecnologie Energetiche e Fonti Rinnovabili, with funds made available by the EU - NextGenerationEU - National Recovery and Resilience Plan (NRRP) - Mission 2 - Component 2 - Investment 3.5, Research Operational Plan "Research and Development of Technologies for the Hydrogen Industry" 	2	Design and safety analysis of testing benches for the production of hydrogen from electrolysis and use in fuel cells
17	<b>PhD scholarship</b>	Funded by INAIL – Istituto Nazionale per l'Assicurazione contro gli Infortuni sul Lavoro	2	Development and experimental validation of solutions to increase the safety of mobile robotic systems that physically interact with human operators

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
<b>Qualifications and research proposal evaluation</b>	Applicants' participation is not required	Available from <b>02/07/2024</b>
<b>Oral examination</b>	<b>Date:</b> starting from <b>10/07/2024 – 9.00 a.m. CEST</b> <b>Place:</b> In presence, Sala del Consiglio, Scuola di Ingegneria, Sala Giunta, Department of Industrial Engineering, Viale Risorgimento 2, Bologna. Remotely, using Microsoft Teams	Available from <b>16/07/2024</b>

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 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	
<b>Identity document</b>	Valid identity document with photo (i.e. identity card, passport)
<b>Curriculum Vitae</b>	No specific CV format is required
<b>Degrees</b>	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)
<b>Research proposal</b>	Multi-annual research proposal, <b>with special emphasis on the activities to be completed during the first-year course</b> . The proposal must meet the following requirements: <ul style="list-style-type: none"> <li>- <b>it cannot exceed 20,000 characters</b>, 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);</li> <li>- <b>it must include</b>: the state of the art; description of the proposal; expected results; references.</li> </ul>
SUPPORTING DOCUMENTS	
<b>Thesis abstract</b>	Abstract of the <b>second cycle degree thesis</b> . 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.
<b>Publications</b>	Lists of publications (i.e. monographs, articles on scientific journals) and minor publications (conference papers, etc.)
<b>Other documents</b>	<ul style="list-style-type: none"> <li>- 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</li> <li>- Documents attesting the applicant's foreign languages proficiency</li> <li>- Periods of study abroad, completed by applicants outside their countries of origin (e.g. Erasmus programme or other similar mobility programmes)</li> <li>- Other qualifications attesting the suitability of the applicants (scholarships, prizes, vocational programmes, etc.)</li> </ul>

## 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

<b>Qualifications evaluation</b>	First (Bachelor's) and second cycle (Master's) degrees final marks. 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
<b>Research proposal evaluation</b>	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

English language proficiency	5 points max
Applicant's suitability for academic research and knowledge of the topics connected to the research proposal	20 points max
General knowledge of the PhD programme's main research topics and of the research topics linked to the available PhD positions	25 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 applicant is preliminarily asked to declare any intention to compete for one or more topic-specific positions, if present in the list 'Available Positions and Scholarships' updated to the date of the interview. The oral examination includes a discussion of the research topics for which the candidate is applying and any in-depth questions concerning the

candidate's knowledge and mastery of the main research areas of the PhD programme. **During the oral examination, the applicant's English language proficiency shall be assessed.**

The oral examination is carried out in Italian or in English.

\* Possible further evaluation criteria will be available on the [University website](#), selecting the relevant PhD Programme > "More information".