

# ENGINEERING AND INFORMATION TECHNOLOGY FOR STRUCTURAL AND ENVIRONMENTAL MONITORING AND RISK MANAGEMENT – EIT4SEMM

Section “Positions and scholarships” integrated on 20/05/2020

Section “Positions and scholarships” integrated on 21/05/2020

Section “Positions and scholarships” modified on 25/05/2020

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<b>Starting date of the PhD Programme</b>	01/11/2020
<b>Duration</b>	3 calendar years
<b>Language of the PhD Programme</b>	English
<b>Mandatory stay abroad</b>	Yes (6 months)

## Research topics

The following learning, teaching and research areas have been identified:

- Physical models (analytical and numerical), system identification
- Structural mechanics
- Fluid mechanics, hydrology and soil mechanics
- Geomatics and autoID
- Process safety and loss prevention
- Remote sensing and earth observation systems
- Climate change monitoring and control
- Positioning systems
- Sensors and actuators, interoperability and dependability
- Communication and sensor networks, Internet of Things, Web of Things
- Energy harvesting and power management
- ICT techniques for energy efficiency in buildings and cities
- Nondestructive tests, methods and technologies
- Signal and image processing, computer vision
- HW/SW design of embedded systems
- Machine learning applied to structural and environmental monitoring
- Advanced information processing methodologies, wearable computing, high performance computing
- Information management, big data, crowd sensing, data availability, data privacy and security
- Data modeling, data analysis/uncertainty, learning and cognitive analytics, prediction, decision support
- Domain specific platforms and services
- Modeling and simulation methodologies and tools for complex systems
- Safety, risk analysis and management
- Resilience and resilience engineering
- Logistics (in ordinary and extraordinary conditions)
- Optimization schemes/strategies
- Reliable systems design and project based learning
- Environmental multi-source pollution and control
- Sea pollution control and coastal management
- Emergency management and communication
- Circular economy and circular resource management.

## PhD positions and scholarships

Position n.	Financial support	Description	Positions linked to research subjects
1	PhD Scholarship	Totally funded by the University of Bologna general budget	
2	PhD Scholarship	Totally funded by the University of Bologna general budget	
3	PhD Scholarship	Totally funded by the University of Bologna general budget	
4	PhD Scholarship	Totally funded by the University of Bologna general budget	

5	PhD Scholarship	Funded by MIUR under the "Departments of Excellence" initiative	Structural and Geotechnical Engineering
6	PhD Scholarship	Funded by MIUR under the "Departments of Excellence" initiative	Chemical and Process Engineering
7	Research Grant	Provided by the Department of Civil, Chemical, Environmental, and Materials Engineering. Provided by "Ercole De Castro" Advanced Research Center on Electronic Systems – ARCES. The research grant will have a duration of 12 months, renewable up to 36 months, and a gross percipient amount of 19.367 €.	Embedded machine learning for long-term distributed monitoring and anomaly detection
8	Research Grant	Provided by the Department of Civil, Chemical, Environmental, and Materials Engineering. The research grant will have a duration of 12 months, renewable up to 36 months, and a gross percipient amount of 19.367 €.	Assessment and modelling of Natech events in the process industry
9	Research Grant	Provided by the Department of Civil, Chemical, Environmental, and Materials Engineering. Provided by "Ercole De Castro" Advanced Research Center on Electronic Systems – ARCES. The research grant will have a duration of 12 months, renewable up to 36 months, and a gross percipient amount of € 19.367.	IoT platforms for low-power structural health monitoring of mission-critical systems in the public transport domain

**Positions linked to specific research subjects:** during the oral examination, applicants may express their interest in one or more positions linked to specific research subjects. Considering the expressions of interest above, the Admission Board shall express its view on the suitability of the interested applicants, taking into account their specific skills, experience and aptitude.

#### Admission requirements

Please, see art. 2 of the Call for applications

#### Mandatory documents to be attached to the application

Please, see art. 3 of the Call for applications

**Further qualifications that may be attached to the application, if in possession of the applicant** (only qualifications attested by documents drawn up in Italian or English, shall be considered as valid and assessed by the Admission Board)

- 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:
  - o It must indicate in the cover page the research topics (up to 3) of the PhD Programme covered by the research project proposal and for which the applicant is applying;
  - o It cannot exceed 10.000 characters, including spaces and formula possibly used. This figure does not include: the title of project, the outline, references and images (such as graphs, diagrams, tables etc - where present).

The research projects that successful applicants shall carry out during their doctoral career may possibly differ from the project proposed at the application stage. This shall be defined together with the supervisor and approved by the Academic Board.
- Motivation letter. This must include the reasons prompting the applicant to attend the PhD Programme and those relevant experiences and research interests, that make the applicant suitable for the specific PhD Programme (2000 characters maximum, including spaces).
- Publications *in extenso* (monographs, articles published on scientific journals, volume's chapters).
- Minor publications *in extenso* (national and international conference papers, etc.).
- Abstracts and posters presented during national and international conferences, etc. (max 3).
- Professional Master courses completed in Italy (1st or 2nd level) relevant to the PhD Programme.
- Postgraduate vocational training programmes/specialisation programmes relevant to the PhD Programme.
- 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.
- Work activity.
- Vocational internships.
- Curricular and non-curricular training and guidance internships.
- Documents attesting the knowledge of foreign languages.
- Study periods completed by students 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).

Admission exams (art. 4 of the call for applications)		
<b>Examination type</b>	<b>Schedule</b> (please, note that applicants shall not receive any communication concerning the exams schedule)	<b>Examination results publication</b> (please, note that applicants shall not receive any communication concerning the publication of results)
<b>Qualifications and research project evaluation</b>	Non-presential.	The results of the qualifications and research project evaluation shall be available online starting from the <b>12/06/2020</b> at the page <a href="http://studenti.unibo.it">http://studenti.unibo.it</a> (please, select: "summary of the requests in progress" - "see detail" and open the pdf file "risultati valutazione titoli e progetto")
<b>Oral examination</b>	<b>Date</b>	<b>15/06/2020</b> In case that the oral examination cannot be completed in one day due to the large number of applicants, the oral exam schedule shall be made available at the webpage <a href="http://studenti.unibo.it">http://studenti.unibo.it</a> together with the results of the qualifications and research project evaluation
	<b>Time</b>	9:00 am (local time)
The results of the oral examination shall be available on the webpage <a href="http://studenti.unibo.it">http://studenti.unibo.it</a> starting from <b>30/06/2020</b> (please, select "summary of the requests in progress" - "see detail" and open the pdf file "risultati prova orale")		
Applicants shall take the exam remotely. For further details please refer to the relevant provision laid down in art. 4 of the Call for applications.		
Evaluation criteria		
Points will be allocated to applications out of a total of 100 on the basis of the following weighting:		
<b>1. Qualifications and research project</b>		
<ul style="list-style-type: none"> <li>- Minimum for admission to the oral exam: 30 points</li> <li>- Maximum: 50 points</li> </ul> <p>Only qualifications relating to the last 5 calendar years prior to the calendar year of publication of the Call for applications shall be taken into consideration, with the exception of the University Degree (Diploma di laurea). Please, note that qualifications must be consistent with the PhD Programme.</p> <p>Points relating to qualifications shall be allocated on the basis of the following criteria:</p> <ul style="list-style-type: none"> <li>- Graduation final mark. Undergraduates shall be evaluated on the basis of the Weighted Average Mark (WAM): max 20 points</li> <li>- Publications: max 3 points</li> <li>- Other qualifications: max 2 points</li> </ul> <p>Points relating to the research project shall be allocated on the basis of the following criteria:</p> <ul style="list-style-type: none"> <li>- Scientific value and ground-breaking nature of the proposal: max 12 points</li> <li>- Description and structure of the proposal: max 8 points</li> <li>- Proposal feasibility: max 5 points</li> </ul>		
<b>2. Oral examination</b>		
<ul style="list-style-type: none"> <li>- Minimum for inclusion in the final ranking list: 30 points</li> <li>- Maximum: 50 points</li> </ul> <p>Oral examination includes the presentation of the research project and is intended to assess the suitability of the applicant to pursue scientific research as well as the general knowledge of issues connected to the PhD course. During the oral examination, knowledge of English language shall be assessed. The oral examination is carried out in Italian or in English.</p> <p>Points relating to the oral examination shall be allocated on the basis of the following criteria:</p> <ul style="list-style-type: none"> <li>- Knowledge of the English language: max 5 points</li> <li>- Research project presentation: max 25 points</li> <li>- General knowledge of issues connected to the PhD course: max 20 points</li> </ul>		
Possible evaluation sub-criteria will be available on the <a href="#">Unibo website</a> , selecting the relevant PhD Programme → "PhD programme information" at the bottom of the page in the section "Notices".		

**Final ranking list and enrolment** (arts.6 and 7 of the call for applications)

After the publication of the results of the oral exam, the final ranking list will be available on the [Unibo website](#), selecting the relevant PhD Programme → “PhD programme information” at the bottom of the page in the section “Notices”.

Following the publication of the final ranking list, successful applicants must enrol on <http://studenti.unibo.it> by the deadline indicated on the [Unibo website](#), selecting the relevant PhD Programme → “PhD programme information”.