CIVIL, CHEMICAL, ENVIRONMENTAL AND MATERIALS ENGINEERING

Section "Positions and scholarships" revised on 07/08/2013 and on 06/09/2013

Coordinator
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Website
http://www.dicam.unibo.it/Ricerca/Dottorati/index.html

Duration
3 years

Academic year
2013/2014

Programme start date
01/01/2014

Programme held in Italian and English

Main Department
Department of Civil, Chemical, Environmental and Materials Engineering

Associated Unibo Structures
Building and Construction Interdepartmental Center for Industrial Research (CIRI Edilizia e Costruzioni)
Advanced Applications in Mechanical Engineering and Materials Technology Interdepartmental Center for Industrial Research (CIRI Meccanica Avanzata e Materiali)
Energy and Environment Interdepartmental Center for Industrial Research (CIRI Energia e Ambiente)

Partner Institutions
Consorzio Centro Ceramico – Bologna

Research topics

**Curriculum 1. Infrastructure, Resource and Land Engineering;**
- fluid mechanics and hydraulic modelling;
- hydrology, climate processes and water resources management;
- river and torrent hydraulics and landscape defence;
- maritime hydraulics and coastal engineering;
- water treatment and quality management in the water cycle;
- water distribution and drainage systems;
- analysis of transportation demand;
- transportation networks;
- transportation system analysis;
- materials for road infrastructures;
- safety in road infrastructures;
- management and maintenance of road infrastructures;
- geodetic techniques and applications;
- survey techniques for environmental and landscape applications;
- survey techniques for cultural heritage applications;
- applied geology and geomorphology;
- Georesources and geoengeoingineering modeling;
- Excavation Engineering and Safety;
- LCA, Raw material and recycling engineering;
- Petroleum, geothermal and underground water engineering;
- Rocks and porous media characterization;
- Engineering technologies for developing Countries.

**Curriculum 2. Structural and Geotechnical Engineering**
- mechanics of solids and structures;
- mechanics of materials, with special attention to new conception materials;
- fracture mechanics;
- computational mechanics;
- theories and techniques for conception and design of safe structures;
- theories and techniques for design and rehabilitation of structures in seismic areas;
- theories and technique for the intervention on cultural heritage buildings;
- physical and mechanical characterization of soils and rocks;
- constitutive and numerical modeling of geomaterial behaviours;
- behaviour modeling of geotechnical works;
- Engineering technologies for developing Countries.

**Curriculum 3: Chemical and process engineering**
- Transport phenomena and Thermodynamics in advanced materials;
- New technologies for environmental protection, energy production and renewable resources management;
- New technologies for biomedical and pharmaceutical applications;
- Innovation in chemical and biochemical processes;
- Membrane separation processes and membrane reactors;
- Biofuel reactors for environmental protection and for the production of chemicals and biofuels;
- Fluid-dynamic characterization and CFD modeling of process equipments;
- Process Intensification in the chemical industry and in energy production;
- Risk assessment of chemical production processes and of hazardous materials transportation;
- Safety and sustainability in the process industry;
- Engineering technologies for developing Countries.

**Curriculum 4: Materials Engineering and Industrial Biotechnology.**
- Ceramic materials;
- Polymers and composite materials;
- Sustainable materials and durability;
- Materials and technologies for cultural heritage;
- Advanced materials for structural applications;
- Materials for biomedical applications;
- Biopolymers from renewable resources and biodegradable polymers;
- Biocatalysis and biorefinery;
- Food biotechnology;
Requirements and admission procedures

Rights to admission

An Italian university degree (laurea specialistica/ magistrale - 3+2 years) or pre-reform degree (vecchio ordinamento - 4 years) or an equivalent degree obtained abroad. Also applicants whose degree will be awarded no later than December 31, 2013 can participate to the selection procedures.

Eligible applicants

For applicants residing abroad, the oral examination can be done remotely through video-conference based on the IP protocol (such as through Skype with webcam). In this case, at the time of application for admission, applicants should indicate the choice of this mode for the oral examination and indicate a valid address/contact. The request must be authorized by the Admission Board upon verification of the conditions needed to ensure the proper conduct of the test (via a trustee, who will verify the applicant’s identity and will be staying on the applicant’s site during the examination).

Mandatory documents to be enclosed with the online application (failure to comply with such requirements will result in the exclusion from the competition)

1. CV
2. copy of Bachelor’s and Master’s degree, list of exams taken with grades and final mark (in Italian or English)
3. only for those who do not hold a Master’s degree when submitting the application: copy of the exams taken with grades obtained abroad. Also applicants whose degree will be awarded no later than December 31, 2013 can participate to the selection procedures.

For documents listed at points 2. and 3., please note that:
- for degrees obtained in Italian Universities: upload a SIGNED self-declaration;
- for degrees obtained in non-EU Countries: upload the degree certificate issued by the relevant University;
- for degrees obtained in EU countries (except Italy): you can either upload a SIGNED self-declaration or the degree certificate issued by the relevant University, translated in Italian or English;
- all documents must contain the following information: personal data, name of the University, degree name, final score, transcript (see art. 2 of the call).

4. Research project that the applicant would conduct during the PhD programme (maximum 8.000 characters); the research project must deal with one of the research topics included in the Programme’s Curricula. Such a project will not necessarily be the subject of the successful applicant’s doctoral studies.

5. N.2 letters of recommendation, certifying the applicant’s aptitude and interest for scientific research (to be sent through the procedure available at the URL http://studenti.unibo.it)

Other documents to be enclosed, if available

- Master thesis
- Scientific papers / proceedings of international conferences in English
- Any other relevant document (scholarships, awards, attendance to courses, participation to Erasmus or other exchange programs, working experiences, etc.)

Assessment criteria

Total score: 100/100

1. Evaluation of qualifications and research project
   - minimum score required for the admission to the oral examination: 30
   - maximum score: 50
   Score is assigned as follows:
   - evaluation of Curriculum vitae (degree mark, for applicants who have a university degree at the time of submission of the application, or evaluation of the university exams taken with grades, for graduands): max 30 points;
   - research project: max 20 points
   The results of the evaluation of qualifications and research project will be posted on the bullet board of the Department and on the site http://studenti.unibo.it, restricted access by University credentials (by selecting: sintesi delle richieste in corso → vedi dettaglio → risultati prova).

2. Oral examination
   - minimum score required in order to be listed in the final ranking: 30
   - maximum score: 50
   The oral examination will focus on the explanation and discussion of the applicant’s research project.
   The oral examination will assess the applicant’s aptitude for scientific research, as well as her/his knowledge about the topics included in the Curriculum he/she has chosen.
   The results of the oral examination will be posted on the bullet board of the Department and on the site http://studenti.unibo.it (by selecting: sintesi delle richieste in corso → vedi dettaglio → risultati prova2).
   The final ranking with details of winners will be published on the site http://studenti.unibo.it, restricted access by University credentials. Any information concerning the publication of the final ranking will be available on www.unibo.it/Dottorati/Bandi29.
   The Admission Board will not send any communication to the applicants about the outcome of the tests. It is the responsibility of the applicants to be informed on the outcome (see art. 6 of the call).

Language requirements

The documents enclosed with the application can be submitted either in Italian or English, according to the preference of the applicant. The oral examination will be held either in Italian or English, according to the applicant’s choice.
In case the oral examination is performed in Italian, the applicant’s knowledge of the Italian language will be assessed.
In case the oral examination is performed in English, the Admission Board may assess the applicant’s knowledge of the Italian language.
Positions and scholarships

<table>
<thead>
<tr>
<th>Total number of positions: 34, of which:</th>
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<tbody>
<tr>
<td>11 positions with scholarship granted by University of Bologna (one scholarship is made available with funds provided in part by the Department of Civil, Chemical, Environmental and Materials Engineering)</td>
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<tr>
<td>2 positions with scholarship “Fondo Giovani 2012” granted by MIUR, committed to:</td>
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<tr>
<td>o Scope of Investigation 6 “Advanced materials (in particular ceramics) for structural applications”</td>
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<tr>
<td>o Scope of Investigation 10 “Energy saving and microdistributed generation”</td>
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<tr>
<td>1 position with scholarship granted by Biosphere srl committed to the scope of investigation: Industrial Biotechnologies for chemical and energy valorization of biomasses and organic waste</td>
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<tr>
<td>1 position with scholarship granted by Hera S.p.A., committed to the scope of investigation: Life Cycle Assessment (LCA), Raw Material and Recycling Engineering</td>
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<td>19 positions without scholarship</td>
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