PhD in PROGETTAZIONE ARCHITETTONICA, URBANA E DEGLI INTERNI / ARCHITECTURAL, URBAN AND INTERIOR DESIGN - 36th cycle

Research Field: URBAN REGENERATION THROUGH NATURE BASED SOLUTIONS. FOR AN ENVIRONMENTAL RESILIENCY TO THE CLIMATE CHANGE

<table>
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<th>Monthly net income of PhD scholarship (max 36 months)</th>
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<td>€ 1180.0</td>
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In case of a change of the welfare rates during the three-year period, the amount could be modified.

Context of the research activity

Interdisciplinary PhD Grant
The PhD research will be carried out in collaboration with research groups of the PhD programme in "Architecture, Built Environment and Construction Engineering". See http://www.dottorato.polimi.it/en/ for further information.

The proposed research aims to identify tools, methodologies and techniques, in architectural design, for the use of Nature Based Solutions, to be applied in degraded, marginal, abandoned urban areas. One of the main problems, in addressing the changes brought about by climate change, is the measure the effectiveness of the proposed solutions in terms of mitigation and adaptation. In the field of architectural and urban design, the role of evaluation of measurable factors (costs of construction and management, environmental impacts caused and avoided) is very important to guide the choices, but the framework of indicators and evaluation methodologies is still variable and uncertain.

The management of NBS strategies, in particular in the field of architectural and urban design, requires an interdisciplinary approach to verify the effectiveness of the implemented strategies. In particular, tools and methods are needed to verify and monitor the reduction over time of pollutants captured and environmental impact in the life
cycle (Assessment and carbon sequestration), the attenuation of the urban heat island and the conditions of environmental comfort, improvement of the air quality and health of the inhabitants, the water cycle (absorption and reduction of the peaks), the biodiversity, etc...

These aspects must be related to the characteristics of the context, being influenced by factors such as urban morphology and density, traffic and distinction between routes pedestrians and roads, the use of the different parts of the city. Attention to reducing polluting gaseous emissions must be placed not only in the use phase, but also in the transformation phases and in the recycling, demolition operations, disposal of buildings and infrastructures, becoming themselves an additional load element polluting.

The research methodology is set in three phases.

- bibliographic research and case studies;
- cataloging and analysis of case studies, according to multidisciplinary criteria;
- elaboration of methodological projects, on both Italian and European territorial samples, where to combine the urban design approach with tools and methods of qualitative analysis and quantity of the improvements obtainable in the field of reduction of harmful and polluting gaseous emissions and in the attenuation of heat waves. The third phase involves the theoretical construction of schemes and action models of the project, whose replicability can take place through the identification of minimum common criteria in the different contexts of intervention.

The expected result of this interdisciplinary PhD program is a new researcher profile, capable of incubating different aspects of architecture. In particular, as regards the problems related to climate change, we want to train a specific competence on the architecture project on a different scale, such as a complex process of urban
regeneration according to quality standards, quantity of sustainability suitable to characterize urban and infrastructural transformations, in relation to EU objectives for the dissemination of urban and architectural design practices for adaptations to climate change.

Job opportunities

Phd candidates trained with this profile have suitable skills to be employed by Italian and international academic institutions, public bodies and research centers, public development agencies in research, consultancy and design in relation to architectural and urban transformations.

Composition of the research group

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<th>Position</th>
<th>Number</th>
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<tr>
<td>Full Professors</td>
<td>11</td>
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<tr>
<td>Associated Professors</td>
<td>14</td>
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<tr>
<td>Assistant Professors</td>
<td>10</td>
</tr>
<tr>
<td>PhD Students</td>
<td>38</td>
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Name of the research directors

Ilaria Valente, Monica Lavagna

Contacts

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Further information is available at: http://www.auid.polimi.it

Additional support - Financial aid per PhD student per year (gross amount)

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<th>Housing - Foreign Students</th>
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<td>Housing - Out-of-town residents (more than 80Km out of Milano)</td>
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### Universities that are cooperating in the research:
- TU Delft, School of Architecture
- TU Berlin, Institute for Architecture
- ETSAM, Madrid
- Shanghai Jiao Tong University
- University of Ljubljana, Faculty of Architecture

### Educational activities (purchase of study books and material, funding for participation in courses, summer schools, workshops and conferences)
Financial aid per PhD student: max 3068.66 euros

### Workspace
In the AUID room are available workstations for shared use, connected with the printer. All the PhD students can use their own laptop with the wireless connection. Workstations and other equipment are available in the various laboratories linked with the doctoral program.