



PhD in ARCHITETTURA, INGEGNERIA DELLE COSTRUZIONI E AMBIENTE COSTRUITO / ARCHITECTURE, BUILT ENVIRONMENT AND CONSTRUCTION ENGINEERING - 41st cycle

THEMATIC Research Field: ENVIRONMENTAL IMPACT MITIGATION, RESILIENCE AND LIFE CYCLE APPROACH

Monthly net income of PhDscholarship (max 36 months)

€ 1400.0

In case of a change of the welfare rates during the three-year period, the amount could be modified.

Context of the research activity

Motivation and objectives of the research in this field

The environmental issue and sustainable development (Sustainable Development Goals SDGs) require the identification of transformation processes of the built environment characterized by resilience, adaptation and mitigation of environmental impacts, adopting a life cycle thinking approach.

The research area is aimed at defining organizational models, environmental design strategies, process and product solutions that direct the built towards the reduction of environmental impacts, in line with the objectives of decarbonisation, circular economy, bio-economy, green economy, seeking ever greater efficacy in pursuing environmental performance requirements, in their inseparable relationship with social and economic ones.

This area can be defined by technologies, strategies, innovative process and design models and evaluation methods for the efficient use of resources (materials and water), at different scales (region, neighborhood, building, building product) and reduction of environmental impact, in particular:

Resilience, mitigation of climate change and decarbonisation Development of technologies and design/testing of technical solutions (e.g. *bio-based* and



	<p><i>nature-based solutions</i>) enabling speed up the reduction in GHG emission in line with the 2020 goals and for mitigation of the effects of climate change (European Green Deal).</p> <p><u><i>Life cycle approach, sustainability metrics and environmental footprints</i></u> Development of methods and tools for the design and evaluation of the environmental sustainability, with a holistic view along the whole life cycle of construction materials and along the whole value chain of the building process.</p>
<p>Methods and techniques that will be developed and used to carry out the research</p>	<p>The research is based on a first phase of basic <i>curiosity driven</i> exploration, which can then develop towards an applicative and experimental research. The research is carried out by developing knowledge aimed at establishing cultural awareness and technical competence aimed at governing the complexity of the transformation processes of the built environment, considering both the intangible level (information and data management) and the material level (materials and construction solutions). Research and innovation activities must respond and give active support to the development of an evolutive framework that is shaped by societal challenges, by policy and regulatory drivers and by technology and industry trends, that might either be considered as challenges or opportunities.</p> <p>SDGs related to this research:</p> <p>Goal 9 "industry, innovation and infrastructure" "Build resilient infrastructure, promote inclusive and sustainable industrialization, and foster innovation"</p> <p>Goal 11 "Sustainable cities and communities" "Make cities and human settlements inclusive, safe, resilient and sustainable"</p> <p>Goal 12 "Responsible Production and Consumption" "Ensure sustainable consumption and production patterns"</p>
<p>Educational objectives</p>	<p>ABC-PhD Candidates are expected to produce knowledge</p>



	advancements in their scientific field, trained in communication, management, networking and other transferrable skills, that are fundamental for doing research in this complex world. They are taught to cooperate, going beyond the limits of one scientific discipline.
Job opportunities	The environmental expertise in AEC sector will offer the best occupational opportunities for employments in architectural and engineering design enterprises, in public bodies (as technical support for policy makers), in research institutions, at national and international level.
Composition of the research group	1 Full Professors 1 Associated Professors 2 Assistant Professors 5 PhD Students
Name of the research directors	Andrea Campioli, Monica Lavagna

Contacts	
<i>Prof.ssa Monica Lavagna</i> <i>Email monica.lavagna@polimi.it</i>	

Additional support - Financial aid per PhD student per year (gross amount)	
Housing - Foreign Students	--
Housing - Out-of-town residents	--

Scholarship Increase for a period abroad	
Amount monthly	700.0 €
By number of months	6

Stage and period abroad	
Institution or company where the candidate will spend the period abroad (name and brief description)	
By number of months abroad	0

Additional information: educational activity, teaching assistantship, computer availability, desk availability, any other information
Additional support: Budget for the research activity (only for position supported by scholarship): total amount Euro 5.707,20 per student



In detail:

- 1st year Euro 1.902,40
- 2nd year Euro 1.902,40
- 3rd year Euro 1.902,40

Additional information about the organization and regulations of ABC-PhD programme can be found in the Regulations for the 41st Cycle of ABC-PhD: download is available at link:

<https://www.dottorato.polimi.it/en/phd-programmes>

Additional information about ABC department and ABC-PhD programme: available at link:

<https://www.dabc.polimi.it/>

Desk availability: The ABC department provides non-permanent desks to be temporarily booked in common PhD rooms.