



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

**THEMATIC Research Field: DESIGN FOR CIRCULARITY AND ADAPTABILITY IN THE CONSTRUCTION SECTOR**

**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 limitations of the contemporary linear economic system necessitate a fundamental shift in resource utilization, promoting solutions aligned with the principles of the circular economy, which are essential for sustainability in architectural technology. However, given the current reality, which remains distant from this ideal model of production and consumption, there is an urgent need to emphasize structural change in this direction. The transition from a linear to a circular model presents a significant challenge that requires concrete actions, including a redesign of conventional technological systems, with the explicit aim of configuring a new framework capable of maximizing resource value. Consequently, the shift from the prevailing "take-produce-dispose" paradigm to one centred on circularity is driven by project-based innovation. This research aims to explore methods, tools, and approaches for steering architectural design towards circularity objectives, adopting a technological approach that enables integrated control over both spatial and constructional solutions, thereby ensuring the adaptability and transformability of buildings.

**Methods and techniques that will be developed and used to carry out the**

The research is based on a first phase of basic *curiosity*



<p>developed and used to carry out the research</p>	<p><i>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. Specifically, the research activity aims to develop guidelines and evaluation tools designed to guide and "measure" the adaptability and reversibility of architectural design.</p> <p><b>SDGs related to this research:</b></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 advancements in their scientific field. Moreover, they are raised to be resilient, not frightened by the uncertainty and failure risks of innovations, trained in communication, management, networking and other transferrable skills, that are fundamental for doing research in this complex world. They are taught to cooperate in a competitive environment and to exploit their creativity to reach their goal, going beyond the limits of one scientific discipline, interacting and learning from other researchers and colleagues. Eventually, they are pushed to find out (and to</p>



	<p>network with) the possible stakeholders of their work.</p> <p>We purport that the best value for the Candidate and for the Program itself is the reward given by the chance of a practical application of the knowledge advancements realized. With this experience, ABC-PhD Doctors are expected to acquire the capacity to shoulder the responsibilities of R&amp;D activities, to plan and to manage control tasks, to help the development and the critical optimization of policies and projects, to innovate: in particular about the PhD thesis topic, in general about the many sectors of Architecture, Built Environment and Construction Engineering and in all the most critical subjects related to the sustainable transformation and management of the Built Environment (environmental, economic, social and cultural sustainability).</p>
<b>Job opportunities</b>	<p>The ABC-PhD program offers advanced scientific knowledge, R&amp;D management skills, and global communication proficiency in English. Graduates are highly qualified for roles in top international universities, research centers, architectural and engineering firms, and public institutions. They excel as problem-setters and solvers, adept at modeling complex environments and applying critical thinking to deliver reliable solutions. The program aligns strategically with the ECTP and EU's research and innovation goals, focusing on industry 4.0 and digital transition impacts.</p>
<b>Composition of the research group</b>	<p>1 Full Professors 1 Associated Professors 1 Assistant Professors 1 PhD Students</p>
<b>Name of the research directors</b>	Elisabetta Ginelli, Laura Daglio

<b>Contacts</b>
<i>laura.daglio@polimi.it</i>

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



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:

- 1<sup>st</sup> year Euro 1.902,40
- 2<sup>nd</sup> year Euro 1.902,40
- 3<sup>rd</sup> year Euro 1.902,40

**Additional information about the organization and regulations of ABC-PhD programme can be found in the Regulations for the 41<sup>st</sup> 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.