POLITECNICO DI MILANO

PhD in DESIGN - 38th cycle

PARTENARIATO PNRR Research Field: ECO-DESIGN STRATEGIES: MATERIALS, PRODUCTS, SERVICES, AND SYSTEMS

Monthly net income of PhDscholarship (max 36 months)
€ 1250.0 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 research will be strictly connected to the development of the Italian PNRR with a specific focus on the activities of PE_11: Circular and Sustainable Made in Italy, coordinated by Politecnico di Milano. Made in Italy products, especially for what concerns high-end and premium productions in industries such as fashion and furniture and in turn for all advanced sectors connected to the so called "made in Italy" industries, are internationally acknowledged for the quality of their design. While Italian companies have been always able to invest in design, making it a critical lever for their products' global success, nevertheless a paradigmatic change is needed to also transform design approaches, methodologies and tools to incorporate sustainability since the early stages of products' conception and development. This transformation will dramatically reduce their environmental impacts: as highlighted by the recent Ecodesign working plan 2022-24, 80% of the environmental impact of a product is related to the design phase (Ecodesign working plan 2022-24). Moreover, it could include sustainability among made in Italy's distinctive qualities, touching on a growingly important aspect for global competition, especially within advanced markets and new generations of consumers. Therefore, design needs to intervene throughout the entire Product Service Systems (PSS) life cycle (cradle-to-cradle) with the aim of reducing the overall impact of products, services, systems and processes. By this means, acting with its role of catalysis between the different knowledge domains and expertise involved, it

	can bridge the potential of scientific and technological innovations with emerging behaviors. In light of this premise, the research aims at study, develop and experiment with a portfolio of PSS eco-design strategies that support all design phases: design of PSS architecture, materials, and components; cradle-to-cradle PSS lifecycle design and impacts evaluation; service and communication design for social innovation and behavioral change. Main objectives of the research: - Mapping and analysing a portfolio of eco-design strategies and related methodologies and tools that support all phases of PSS design, and lifecycle management. - Studying and modeling cradle-to-cradle design approaches based on new models of PSS impact assessment along their entire lifecycle up to their potential zero-impact dismission, recycle, reuse and/or remanufacturing. - Elaborating and experimenting design actions to promote social innovation and to support sustainable behavioral change.
Methods and techniques that will be developed and used to carry out the research	The research will be based on qualitative evaluation methods and a Systemic Design approach. Therefore it will also adopt Design Thinking models, methodologies and tools for PSS, such as participative and collaborative practices, co-design, user and community-centered design. It will also source from several methodologies applied in sustainable design such as products cycle assessment, and quantitative assessment (LCA, LCC and Life Cycle Social Assessment, and Design of Experiments -DOE), Zero waste design methodologies, design for disassembly techniques, etc. The research will mainly be organized into the following phases: - Framing and modeling design approaches, methodologies and tools - Design driven experimentations - Proof of concept validation - Dissemination and communication

Educational objectives	The PhD programme aims at educating researcher who will contribute original knowledge to the field of design by tackling the problems and identifying the potential of contemporary society. Their contribution may be brought to bear in: - creating designs, visions, and proposals (research through design); - developing tools and methods for putting these into practice (research for design); - developing critical analysis of design and its application domain (research on design). The Programme proposes different methodologies of research, promotes the attitude to collaborate, and offers opportunities in universities and research centers, design enterprises and public corporate bodies. Moreover, throughout the research program carried out the candidates will learn: - How to apply specific tools and methodologies for conducting research in the field of design for circularity and sustainability - How to plan and develop a multidisciplinary research program - How to contribute to large research group
Job opportunities	- The graduates will find opportunities both in private and public sectors as experts in the field of sustainable transformation. - More in detail possible areas of placement: - Large companies and SMEs within the made in Italy sectors - Public institutions and bodies focused on sustainable transformation - Professional studios and agencies active in the research, design and development of sustainable solutions and PSS - Research and educational institutions
Composition of the research group	3 Full Professors 3 Associated Professors 6 Assistant Professors

	6 PhD Students
Name of the research directors	Paola Bertola

Contacts
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Additional support - Financial aid per PhD student per year (gross amount)	
Housing - Foreign Students	--
Housing - Out-of-town residents (more than 80Km out of Milano)	--

Scholarship Increase for a period abroad	
Amount monthly	873.07 €
By number of months	6

Additional information: educational activity, teaching assistantship, computer availability, desk availability, any other information
Educational activities (purchase of study books and material, funding for participation in courses, summer schools, workshops and conferences): financial aid per PhD student max 5.095,96 euros per student (total for 3 years) Teaching assistanship: availability of funding in recognition of supporting teaching activities by the PhD student there are various forms of financial aid both for research and teaching activities. The PhD student is encouraged to take part in these activities, within the limits allowed by the regulations. Computer availability: 1st year, 2nd year and 3rd year: Each research group will supply PhD student with a computer, if necessary. Desk availability: 1st year, 2nd year and 3rd year: Each research group will supply phd student with a desk