

RESEARCH THEME

XLI Cycle – a.y. 2025/2026

Title of the doctoral research Beyond Knitting: Textile Structures to Integrate Design, Technology, and Sustainability Across Sectors

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Abstract Knit design, traditionally associated with fashion, is emerging as a versatile technique applicable to various fields beyond apparel. Its intrinsic properties—flexibility, adaptability, and efficiency in waste reduction—make it valuable for industries requiring lightweight, high-performance, and sustainable solutions. This research explores how knitted textiles and knit design methodologies can be applied in new contexts, integrating computational design, material innovation, advanced manufacturing techniques, and sustainability principles. By investigating their potential in areas such as product design, architecture, soft robotics, medical applications, and wearable technology, the study aims to develop novel frameworks that harness the benefits of knitted structures. Additionally, it will analyze the mechanical behavior, structural performance, and customization potential of knitted materials to optimize their use in diverse sectors. Through interdisciplinary collaboration, the project seeks to bridge textile design with engineering, digital fabrication, and emerging technologies, fostering innovative material applications and expanding the role of knit design in shaping the future of a more sustainable, efficient, and technologically advanced design and production landscape.

Keywords Knit Design, Advanced Textiles, Interdisciplinary Innovation