

Product Design for Human-Robot Interaction

PRODUCT DESIGN

OVERVIEW

This Master's course trains designers to work at the point **where technology and human behavior meet**.

Students learn to design non humanoid robots systems by combining **cognitive ergonomics**, **product system thinking** and emerging technologies such as **AI**, **sensors** and **smart actuation**.

Through **visits to leading research labs**, hands on **prototyping** and **collaboration with engineers**, they gain practical skills in AI, robotics, CAD modelling, testing and functional prototyping. Design Semiotics and communication courses help students **understand cultural meaning** and **build strong visual storytelling** for complex systems.

Students then design robotic products that are usable, intelligent and human centered, ready for roles in advanced product design and innovation.

COURSE TYPE

Master's Degree

AFAM / 60 CFA equivalent
to 60 ECTS credits

**Recognized by the Italian Ministry
of University and Research.**

**The course is currently undergoing
revalidation by the Italian Ministry
of University and Research under
the title: *Product Design for Human-AI
Interaction***

WHY MILAN?

As a global capital of design, luxury and innovation, the City of Milan offers privileged access to **leading brands**, **design studios**, **exhibitions**, **trade fairs** and **industry events**. The city becomes an extended classroom where students can observe and interact with excellence in craftsmanship, hospitality and contemporary living.



KEY OUTCOMES

- Students will be able to design innovative non humanoid robotic products by combining cognitive ergonomics, interaction principles and product system thinking, creating solutions that respond clearly to human needs, behaviors and expectations.
- Students will be able to apply and integrate key technologies, including AI, sensors, actuators, perception systems, movement and manipulation, using CAD CAM modelling, prototyping tools, IoT and plug and play electronics to develop functional HRI prototypes.
- Students will connect theoretical research with practice, using semiotics, trend analysis and user studies to develop informed product concepts, supported by structured methods, functional diagrams, technical drawings, high quality renderings and clear storytelling.
- Students will be able to present complex robotic product ideas through compelling visual communication, master AI assisted and traditional design tools, and collaborate effectively with engineers, researchers and multidisciplinary teams throughout the development process.

INDUSTRY COLLABORATIONS

Thanks to Istituto Marangoni's **strong ties with leading luxury companies** and its diverse international student community, Istituto Marangoni Milano offers a unique methodology that allows students to work on projects under the supervision of the most prestigious fashion and beauty brands, gaining valuable global perspectives.

Some industry collaborations include:

E-NOVIA

ISTITUTO ITALIANO DI TECNOLOGIA

MOLTENI&C

ALESSI

FACULTY

The Faculty at Istituto Marangoni is recognised internationally for its academic excellence and strong Industry connections. Lecturers and teachers are established professionals who bring real world expertise into the classroom, offering students direct insight into contemporary practices, emerging trends, and the dynamics of the global fashion, design, and luxury industries.



SUBJECT	DESCRIPTION	ECTS
COGNITIVE ERGONOMICS	The course introduces how people think, interpret signals and interact with objects, interfaces and robots. Students learn to design products that match users' mental models, reduce cognitive load and prevent errors. Through case studies and hands on exercises, they develop a mindset focused on clarity, usability and intuitive interaction. By the end, they understand how to create smooth and human centered interactions for both physical and digital systems.	3
DESIGN OF THE PRODUCT SYSTEM	Teaches students to design non humanoid robotic products from research to preliminary prototypes. Students work across engineering and design, visiting leading laboratories and studying real robotic technologies such as perception, artificial intelligence, movement and manipulation. They learn how to analyze contexts, define opportunities and integrate robotics into meaningful use cases. The course trains students to collaborate with engineers, understand constraints and transform technological insights into clear design solutions supported by functional diagrams, models and early prototypes.	8
COMPUTER AIDED DESIGN (CAD)	Students gain strong technical skills in Fusion 360 and KeyShot. They learn solid and parametric modelling, assemblies, sheet metal, technical layouts and photorealistic rendering. These tools allow them to visualize robotic concepts with accuracy, test proportions and mechanisms and produce high quality images and animations for communication and validation.	5
RENDERING	Technical courses teach advanced 3D modelling. Students learn solid, parametric and form modelling, together with photorealistic rendering, animations and communication through digital assets. These skills support the visualisation and validation of complex product ideas.	5
INTEGRATED PRODUCT DESIGN	These classes teach structured processes for turning insights into design solutions. Students learn how to research users, decode trends and understand social dynamics. They analyse brands and briefs, build moodboards and generate early concepts before moving into detailed development.	8
DESIGN SEMIOTICS	Students explore how cultural meaning, aesthetic languages and communication codes influence product perception. They study how contemporary design languages evolve and how the human body interacts with objects and systems, learning to create products that are clear, expressive and culturally aware.	3
PROTOTYPING	This course focuses on making real and functional prototypes for human robot interaction. Students work with 3D printing, simple electronics, sensors, actuators, coding, IoT and AI plug and play tools. They build and test robots, run user tests and iterate based on feedback. The goal is to understand how physical, digital and behavioral elements shape interaction and usability.	6
PRODUCT COMMUNICATION	The course develops strong visual storytelling skills. Students build compelling presentations, create coherent visual identities and use AI assisted tools and traditional software to communicate complex concepts clearly.	6
INTERNSHIP	Internship.	10
DISSERTATION	Final written thesis.	6