FA5 Mechatronics for Manufacturing (PC)

LEARNING OBJECTIVES

The Mechatronics for Manufacturing track aims to sculpt adept mechanical engineers with the expertise to craft, cherry-pick, and fine-tune intricate mechatronics systems (machines, robots, automated lines, etc.) within the realm of manufacturing and production engineering. Infused with the latest academic achievements and cutting-edge innovations, this training program anticipates the emergence of professionals who can not only elevate mechatronic systems during design but also revolutionize their utilization through avant-garde methodologies, introducing breakthroughs and embracing emerging technologies. The training program boasts a robust connection with key industry players who actively engage in training activities, providing invaluable on-the-job experiences to the participants.

PRE-REQUISITES

While there are no specific prerequisites for the Mechatronics for Manufacturing track, a predisposition towards a multidisciplinary approach and motivation to tackle sector challenges are essential.

PARTNER UNIVERSITIES

Upon request, the opportunity to undertake a master's degree thesis abroad is presented, leveraging established collaborations between Politecnico di Milano and other prestigious universities. Alternatively, students can opt to collaborate with key industry players in the field, adding a practical and global dimension to their academic experience.

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LEARNING OUTCOMES

The Mechatronics for Manufacturing training program is designed to cultivate essential competencies across various dimensions where intricate mechatronic systems play a pivotal role in manufacturing. For instance, delving into methodologies to analyse dynamic interactions between machines and processes, mastering the development of advanced monitoring and control strategies, and adeptly creating digital twins and cyber-physical systems exemplify the last strides in the field. Furthermore, the program highlights the strategic utilization of state-of-the-art materials, immersive Extended Reality applications, and advanced simulation techniques. It goes beyond by emphasizing methodologies for evaluating and championing sustainability, demonstrating the program's commitment to the creation of broad and structured technical expertise.

JOB OPPORTUNITIES

This fusion of expertise from academia and industry opens up exciting opportunities to forge a dynamic professional career within companies specializing in the design or utilization of machinery and robots in manufacturing. Envisaged roles span from the research and development department to project management, encompassing emerging professions such as manufacturing sustainability experts and manufacturing data specialists. This comprehensive training program not only cultivates paths to consultancy roles but also paves the way for careers in applied research, providing a compelling and versatile appeal for aspiring professionals.

FA5 Mechatronics for Manufacturing (PC)

1 YEAR COURSES
60 ECTS

40 ECTS

	ECTS
Advanced Dynamics of Mechanical Systems	10
Digital and Advanced Manufacturing	10
Machine Design	5
Measurements and Industrial Internet of Things	10
Smart Materials	5

20 ECTS

	ECTS
Advanced Feedback Control Design	10
Mechatronics for Sustainable Manufacturing	10

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2 YEAR COURSES

40 ECTS + 20 ECTS Master's Thesis

10 ECTS

	ECTS
Robotics for Manufacturing	10

10 ECTS

	ECTS
Cyber-Physical Manufacturing Systems	5
Finite Element Simulation for Mechanical Design	5

5 ECTS

	ECTS
LAB - Machinery Mechatronic Design	5

FA5 Mechatronics for Manufacturing (PC)

15 ECTS

	ECTS
Collaborative Robotics	5
Digital Machining B	5
Energy Systems	5
Machine Learning for Mechanical Systems	5
Polymer Technologies for Circular Economy	5
Reliable and Resilient Design of Mechanical Systems	5
Topology Optimisation	5
Vision Based Measuring Systems for Engineering	5
XR Applications for Engineering	5