

FA6 Smart and Sustainable Industry (LC)

LEARNING OBJECTIVES

The Smart and Sustainable Industry track aims to train mechanical engineers with specific expertise in designing, producing, managing, and optimizing sustainable industrial systems by implementing Industry 4.0 technologies, such as the Industrial Internet of Things, Cyber-Physical Systems, Artificial Intelligence, and Cloud Computing. The educational goals primarily focus on understanding the principles of mechanical engineering applied to sustainable industrial contexts with a strong hands-on approach. Students will acquire skills related to the application of smart technologies throughout the entire lifecycle of industrial products. In particular, they will focus on practical skills for designing, developing, and testing innovative solutions. Furthermore, they will improve their knowledge about technologies related to sustainable products and materials, advanced sensors, 3D printing, artificial intelligence applied to production, and optimizing the performance of production systems using numerical and mathematical models.

PRE-REQUISITES

The main requirement for aspiring students in the Smart and Sustainable Industry track is a keen interest in the challenges of industrial sustainability and a strong inclination towards practical activities and experimentation. No specific prerequisites beyond those common to other Mechanical Engineering tracks are required. However, solid foundational skills, particularly in mathematics and physics, and a predisposition towards experimental activities are advisable.



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LEARNING OBJECTIVES

Graduates in Mechanical Engineering specializing in Smart and Sustainable Industry acquire in-depth skills in designing innovative machinery and production plants and managing sustainable production systems. Their training enables them to tackle complex problems in industrial contexts, integrating knowledge of emerging technologies to enhance the efficiency and sustainability of production processes. Course assessment methods primarily include projects, laboratory experiences, and industry collaboration.

PRE-REQUISITES

Graduates will be able to pursue careers in companies specialized in the design and production of machinery, industrial plants, and mechanical components, thanks to their acquired skills in intelligent technologies. Career opportunities will extend not only to the specific field of mechanical engineering but also to related sectors such as energy, occupational safety, and the production of goods and services.

PARTNER UNIVERSITIES

Specific agreements for student mobility are being defined with European, American, and Asian universities.



FA6 Smart and Sustainable Industry (LC)

1 YEAR COURSES 60 ECTS

60 ECTS

ECTS

<u>Energy Systems for Sustainable Engineering</u>	5
<u>Data Analysis for Mechanical Systems B</u>	5
<u>Control and Actuating Devices for Mechanical Systems</u>	10
<u>Dynamics of Mechanical Systems</u>	5
<u>Advanced Machine Design</u>	10
<u>Sustainable Manufacturing Processes</u>	10
<u>Design and Management of Production Systems</u>	10
<u>Materials for Sustainable Industry</u>	5

FA6 Smart and Sustainable Industry (LC)

2 YEAR COURSES
40 ECTS + 20 ECTS Master's Thesis

35 ECTS

ECTS

<u>Vision Based 3D Measurements</u>	5
<u>Collaborative Robotics</u>	5
<u>Robotics and Mechatronics</u>	5
<u>Lightweight Design of Mechanical Systems</u>	5
<u>Computer Aided Design and Mechanical Prototyping</u>	10
<u>Logistics Management</u>	5
<u>Laboratory of Materials and Damage Analysis</u>	10
<u>Technologies for Artificial Intelligence</u>	5
<u>Finite Element Method based Optimization of Manufacturing Processes</u>	5

5 ECTS

ECTS

<u>Open Course</u>	5
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