Master of Science in Mechanical Engineering

Mechatronics for Manufacturing

FA5

Contacts

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Track description

In a fast-changing world, manufacturers must become quicker, smarter, and greener.
The Mechatronics for Manufacturing track covers the broad field of mechatronics related to digital manufacturing processes and systems. The courses will provide meaningful examples from industrial applications and companies will be actively involved in the teaching process.

Skills

Students will learn how to:

- design, monitor and control smart mechatronic systems and solutions
- take manufacturing sustainability into account
- apply the Industry 5.0 paradigm
- develop advanced monitoring and predictive maintenance solutions
- perform manufacturing data analysis
- develop advanced and human-centred manufacturing solutions based on cyber-physical approaches & digital twins

FA5: Core Courses

Course Title	YEAR	SEM	ECTS	ECTS GROUP
Measurements and Industrial Internet of Things	1	1	10	10
Dynamics and Control for Mechatronics	1	1	10	10
Digital and Advanced Manufacturing	1	1	10	10
Machine Design for Mechatronic and Robotic Systems	1	2	5	5
Smart Materials	1	2	5	5
Advanced Feedback Control Design	1	2	10	10
Mechatronics for Sustainable Manufacturing	1	2	10	10

FA5: Track Specific Courses

Course Title	YEAR	SEM	ECTS	ECTS GROUP
Robotics for Manufacturing	2	1	10	10
Computational Fluid Dynamics for Manufacturing Processes	2	TBD	5	20
Energy Systems	2	TBD	5	
Vision Based Measuring Systems for Engineering	2	TBD	5	
Machine Learning and Model Identification for Mechanical Systems	2	TBD	5	
Finite Element Simulation for Mechanical Design	2	TBD	5	
Precision Machine Design	2	TBD	5	
XR Applications for Engineering	2	TBD	5	
Cyber-Physical Manufacturing Systems	2	TBD	5	
Open Course	2	1-2	5	5
Lab course (Machinery Mechatronic Design)	2	2	5	5

FA5: Master's Thesis

Development of prognostic solutions for cutting tools

Development of a robotic vision system for automatic product quality inspection

Development of a piezo-active modulating tool for suppressing regenerative vibrations

CFD modelling of cryogenic machining