CC2 Wind Energy

LEARNING OBJECTIVES

The Wind Energy track is designed to provide comprehensive training to mechanical engineers, equipping them with the interdisciplinary skills necessary for employment in the dynamic wind energy industry. This field heavily relies on mechanics, aeronautics, automation, and electronic engineering expertise. Students pursuing this major will undertake two specialized courses focusing on dynamics and control as applied to wind turbines. Additionally, they will be able to further enhance their skills by selecting courses aligned with their interests in related subjects.

PRE-REQUISITES

The Wind Energy track has no specific prerequisites compared to other master's degree courses in mechanical engineering. However, students should have a solid foundation in the mathematical-physical field. This will enhance their learning experience in the track courses, where they will acquire specialized skills.

LEARNING OUTCOMES

The graduate of the Wind Energy track receives comprehensive training in a wide range of topics. These include dynamics and control of mechanical systems, aerodynamics, materials engineering, structural design of mechanical components, and system management.

CC2 Wind Energy

JOB OPPORTUNITIES

The European Union has set an ambitious target of achieving 42.5% energy production from renewable sources by 2030, necessitating a significant increase in installed wind capacity. The European Commission introduced the European Wind Power Action Plan in September 2023 to meet this objective. Among its objectives is training a specialized workforce of 100,000 individuals for employment in the renewable energy sector.

As students of the Wind Energy track, individuals will have the opportunity to develop expertise that qualifies them for various roles within the wind energy supply chain. This may include involvement in component design and construction, system installation, management, and maintenance. The skills acquired through this major are highly applicable and transferable across the mechanical engineering field, making graduates valuable assets to any company involved in the operation of technologically advanced mechanical systems.

PARTNER UNIVERSITIES

We have established collaborative partnerships with several esteemed European universities that are actively engaged in research and teaching in the wind energy field. These partnerships include renowned institutions such as Danmarks Tekniske Universitet (DTU, Denmark), Carl von Ossietzky Universität Oldenburg (Germany), Technische Universität München (TUM, Germany), Universität Stuttgart (Germany), and Technische Universiteit Delft (TU Delft, The Netherlands). As a result, students have the valuable opportunity to conduct their thesis work in their final year of study at these reputable institutions, further enriching their academic experience and research capabilities.

CC2 Wind Energy

1 YEAR COURSES
60 ECTS

45 ECTS

	ECTS
Energy Systems	10
Dynamics of Mechanical Systems	5
Advanced Machine Design	10
Advanced Manufacturing Processes B	5
Advanced Project Management	10
Materials for Energy	5

15 ECTS

	ECTS
Electric Conversion from Green Sources of Energy	5
Design of Fluid Machines for Clean Power Generation A	10

CC2 Wind Energy

2 YEAR COURSES

40 ECTS + 20 ECTS Master's Thesis

10 ECTS

	ECTS
Wind Turbine and Wind Farm Modelling and Control A	10

5 ECTS

	ECTS
LAB - Wind Energy	5
LAB - Structural Health and Usage Monitoring in Action	5

5 ECTS

	ECTS
Open Couse	5

CC2 Wind Energy

20 ECTS

	ECTS
Computational Fluid Dynamics - Advanced Methods and Applications*	5
Computational Fluid Dynamics - Experimental Assessment	5
Computational Fluid Dynamics - Fundamentals	5
Flow Measurement Systems for Engineering	5
Machine Learning for Mechanical Systems	5
Resource Analysis and Atmospheric Boundary Layer	5
Rotordynamics and Diagnostics B	5
Wind Engineering	5
Intellectual Property and Patents in Innovation	5
Surface Modeling for Engineering Applications	5
De-manufacturing	5
Quality Data Analysis B	5
Lightweight Design of Mechanical Structures - Composite Structures	5
Failure Analysis, Sicurezza Industriale e Ingegneria Forense	5

*Selectable only if also selected Computational Fluid Dynamics - Fundamentals.

CC2 Wind Energy

	ECTS
Lightweight Design of Mechanical Structures - Fundamentals	5
Non-Destructive Testing and Evaluation for Materials and Components	5
Reliable and Resilient Design of Mechanical Systems	5
Intellectual Property and Patents in Innovation	5
Repairing and Re-manufacturing Processes	5
Materials for Sustainable Transportation Systems	5
Failure Analysis, Sicurezza Industriale e Ingegneria Forense	5
Electrical Drives for Industry and Transport Applications	5
Communication Technologies for Industrial and Vehicle Engineering	5