

Master of Science

WIND ENERGY SYSTEMS (WES)

Online degree for engineers and scientists
eager to advance the development of wind energy

A Master of Science of

U N I K A S S E L
V E R S I T Ä T

U N I K I M S

 **Fraunhofer**
IEE



PROGRAM OVERVIEW

Type of program	Part-time online master
University of Kassel	Department of Civil and Environmental Engineering
Final degree	Master of Science (M. Sc.)
Language	English (upon the examiner's consent, module exams may be conducted in another language)
Standard period of study	7 semesters (part-time)
Total credits	120 credits
Program start	Every year in mid-October (winter semester)
Application & deadline	Application period for international students: December 1 - September 1 Application period with a German degree: June 1 - Sept 15
Tuition fees	14,000 Euros (independent of study duration) Can be paid in installments of 2,000 Euros each semester; non-refundable
Semester fees	Ca. 160 Euros each semester
Payment method	Bank transfer
Program management	University of Kassel & UNIKIMS – The Management School of the University of Kassel
Partner institution	Fraunhofer Institute for Energy Economics and Energy Systems Technology (Fraunhofer IEE)
Accreditation	German Accreditation Council (Stiftung Akkreditierungsrat)

WELCOME TO WES.ONLINE

WES.online is a fully online master's program designed for natural scientists and engineers, as well as specialists and managers, who want to deepen their understanding of wind turbines mechanical and electronic operation, design, or component development. Graduates earn a German degree, renowned globally for expertise in wind energy.

The program is tailored for flexibility, allowing you to study alongside a full-time job from anywhere in the world. Courses, taught entirely in English, are delivered in virtual classrooms with the option to attend live lectures or watch recordings later. Exams are conducted online, and you can customize your workload by choosing the number of courses per semester or taking a break if needed.

With small class sizes and direct access to expert instructors, students benefit from personalized support. In addition to our master's program, we offer several 30 credit diploma courses for those looking to specialize in specific aspects of wind energy systems.

WEEKLY CONSULTATION HOURS

For applicants, students and knowledge-seekers

Mondays, 1 to 2 pm

www.unikims.de/wes
No registration or appointment needed



PRACTICAL AND THEORETICAL EXPERTISE

The Online M.Sc. Wind Energy Systems is a comprehensive program structured into four components, each worth 30 credits. It begins with foundational modules that prepare students for specialized courses: Energy System Technology (EST), focusing on wind turbine technologies, grid integration, and energy meteorology, and Simulation and Structural Technology (SST), covering rotor blade design, material behavior, structural and aerodynamic analysis.

The program also includes Key Competencies modules, offering management, project planning, and legal knowledge essential for wind farm development. Students complete their studies with a master’s thesis, applying both technical and non-technical expertise.

What sets this program apart is its unique blend of engineering disciplines, designed to equip graduates for roles in wind turbine manufacturing, project development, and energy system planning. A key benefit is the collaboration with the Fraunhofer Institute for Energy Economics and Energy System Technology (IEE) – Europe’s leading applied research organization – providing cutting-edge insights alongside academic excellence from the University of Kassel, a leader in sustainability studies, as well as knowledge provided by experts working in the wind industry.

CURRICULUM

EXAMPLE OF A COURSE OF STUDY

SEMESTER	MODULE
1.	Minimum of 30 credits6 credits each FUNDAMENTALS OF MATHEMATICS AND ENGINEERING FOR WIND ENERGY SYSTEMS • Application of Software Tools • Design of Mechanical and Electrical Components • Electrical Engineering • Fluid Mechanics • Mathematics • Solid Mechanics
2.	
3.	Select a minimum of 30 credits in your selected specialization, either EST or SST6 credits each SPECIALIZATION: ENERGY SYSTEM TECHNOLOGY (EST) • Construction and Design of Nacelle Systems • Control & Operational Management of Wind Turbines and Wind Farms • Energy Storage • Reliability, Availability, Maintenance Strategies • Technical and Economic Aspects of Grid Integration • Wind Energy Meteorology • possible overhang module from fundamentals SPECIALIZATION: SIMULATION AND STRUCTURAL TECHNOLOGY (SST) • Theoretical Fluid Mechanics • Computational Fluid Dynamics • Linear Computational Structural Mechanics • Nonlinear Computational Structural Mechanics Dynamics • On- and Offshore Foundations • Rotor Aerodynamics • Rotor Blades • Towers • Strength, Durability and Reliability • possible overhang module from fundamentals
4.	
5.	Select a minimum of 30 credits in your selected specialization, the other specialization and additional key competences6 credits each (Max. 18 credits)3 credits each (Min. 12 credits) MODULES FROM NON-SELECTED SPECIALIZATION (SST OR EST) see above ADDITIVE KEY COMPETENCES • Business Administration of Wind Turbines and Wind Farms • Contract Law • Energy Law • Occupational Safety On- and Offshore • Planning and Construction of Wind Farms • Project Management
6.	
7.	30 credits MASTER-THESIS (UNIVERSITY, FRAUNHOFER OR WIND INDUSTRY)

“The master’s program is quite technical, so it is perfect for engineers and people that pursue a technical career in the wind energy industry all around the world! But it also offers modules for additional competencies such as project management or energy and contract law, all of them with focus on wind energy.”

MARCO SHIMONISHI

Alumni of online master’s program in Wind Energy Systems

YOUR BENEFITS

BEFORE

Get personalized support during the application process with responses within 24 hours (excluding weekends) and one-on-one consultations with the course management team.

DURING

- + Study online anytime, anywhere, with flexible course loads
- + Learn in small, interactive classes and take exams online
- + Network with fellow students, lecturers, and wind industry experts from leading institutions like Fraunhofer IEE
- + Complete an internship at Fraunhofer IEE or other suitable Fraunhofer Institutes (voluntary)
- + Participate in a yearly online Wind and Solar Synergy Week, including virtual lab tours, wind park visits, and company insights (voluntary)
- + Access support for any study-related issues and guidance for your master’s thesis

AFTER

Graduate with a German master’s degree in Wind Energy Systems, opening doors to exciting career opportunities in the green energy sector and staying connected with your professional network as well as pursuing a doctorate program.

CAREER OPPORTUNITIES

Graduates of the Online M.Sc. Wind Energy Systems are equipped for diverse roles in the growing wind industry, including wind energy technologies, wind turbine development, wind farm planning, and project management for an engineering career in leading companies like Vestas, Siemens, Enercon and Nordex. The program also prepares students for research and doctoral studies, offering opportunities to work on industry-related projects with institutions like Fraunhofer. This combination of technical and non-technical expertise ensures excellent career prospects worldwide.

DIPLOMA COURSES

To address specific education needs, we offer eight diploma courses, each composed of distinct modules and lectures from the Master Wind Energy Systems.

SCIENTIFICALLY ORIENTED FUNDAMENTALS OF WIND ENERGY SYSTEMS

This diploma course covers key topics for understanding the basic technology and ecologically efficient wind energy systems. It provides basic mathematical knowledge, addresses electrical, fluid, and solid mechanics, as well as includes simulation. This course covers core master's modules and prepares you to continue the full program or specialize through other diploma courses.

ELECTRICAL ENGINEERING OF WIND ENERGY SYSTEMS

One of today's most important topics is the integration of renewables into the power grid. One aspect of interest is the immediate impact of the volatile generation on the grid which is impacted by the different designs of the electrical components and systems. This diploma course explores local grid integration challenges and solutions for smooth, reliable operation.

COMPUTATIONAL WIND ENERGY SYSTEMS

This diploma course covers computational methods for analyzing wind energy converters and surrounding flows. It equips you to effectively use structural and fluid mechanics software, improve numerical methods, and develop realistic computational models of wind energy systems. This knowledge supports optimizing wind turbines for greater efficiency, durability, performance under extreme conditions. Studying this course requires the successful completion of the certificate 'Scientifically Oriented Fundamentals of Wind Energy Systems'.

INTEGRATION OF WIND POWER IN THE ELECTRICITY SUPPLY

This diploma course explores the complex challenges of integrating decentralized, fluctuating wind power into the grid. It covers technical, administrative, and legal aspects to ensure successful integration with renewable and conventional energy sources. Studying this course requires the successful completion of the certificate 'Scientifically Oriented Fundamentals of Wind Energy Systems'.

DIPLOMAS OF ADVANCED STUDIES

Application and further
information about the program:

unikims.de/das



In addition to the master's program Online M.Sc. Wind Energy Systems, we offer The Wind Energy Systems Diploma of Advanced Studies. The diploma courses allow you to specialize in different aspects of wind energy. Each of them consist of five carefully selected modules that will teach you exactly the knowledge which you need to achieve your goal. All credits earned in the diploma programs can be fully transferred to the Master of Science Wind Energy Systems, allowing diploma graduates to seamlessly transition to the full master's program if they choose to continue their studies.

PROGRAM OVERVIEW

Type of program	Part-time online diploma course
Final degree	Diploma of Advanced Studies (DAS)
Language	English
Standard period of study	2 semesters
Total credits	30 credits
Program start	Every semester (October or April)
Tuition fees	6.000 Euros

DIPLOMA COURSES

FLUID MECHANICS OF WIND ENERGY SYSTEMS

In this diploma course you will learn about mathematics and fluid mechanics as well as computational methods used for the fluid mechanical analysis of wind energy converters for stationary and transient applications. The knowledge about the aerodynamics of rotor blades will be facilitated.

STRUCTURAL MECHANICS OF WIND ENERGY SYSTEMS

This diploma course covers fundamental mechanics and numerical methods for analyzing wind turbine structures. It teaches you to interpret stress in various materials, assess structural safety, and select effective model-method combinations. You will also learn to address model limitations by developing custom programs for specialized tasks.

WIND ENERGY CONVERTER SYSTEMS

This diploma course covers engineering, planning, and management of wind turbines and farms. Design and analysis methods for modern on- and offshore foundations, towers, rotor blades and nacelle systems will be taught, along with modules on wind project planning, management, and administration.

AUTONOMOUS WIND ENERGY PRODUCTION AND SUPPLY

This diploma course addresses the growing demand for wind energy in the Global South and other regions with decentralized green energy needs. You will develop an understanding of wind energy technology, the mechanical and electrical components of a wind turbine. In addition, maintenance strategies for wind turbines are taught, including the planning and economic aspects of building a single wind turbine or a whole wind farm.



ABOUT THE UNIVERSITY OF KASSEL

The academic profile of the University of Kassel is shaped by expertise in the fields of nature, technology, culture, and society, with unique potential for interdisciplinary cooperation and innovation.

Founded in 1971, the university is a young, modern institution with approximately 25,000 enrolled students. As a research-oriented university, it is committed to academic excellence and social responsibility. The university's interdisciplinary approach enables it to tackle complex challenges and develop innovative solutions. With a strong focus on internationalization, the University of Kassel offers a diverse range of academic programs that cater to the needs of students from around the world. To address the complex challenges of sustainable development, the University of Kassel has been incorporating sustainable transformation into its programs in recent years.

To complement the university's academic side with more practical aspects, the master's program in Wind Energy Systems is managed by UNIKIMS, the Management School of the University of Kassel, in cooperation with Fraunhofer IEE as a partner institution.

**WE WOULD BE DELIGHTED
TO ADVISE YOU.**

CONTACT US

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More detailed information
about the program is available
online at:

unikims.de/wes



UNIKIMS is the Management School of the University of Kassel specializing in part-time master's programs, certificates, seminars, and corporate training, blending scientific knowledge with practical application. Since 2005, it has become a key partner in continuing education, serving over 1,200 professionals annually from 300+ companies. Designed for full-time employees, UNIKIMS offers flexible learning through concentrated classroom phases, online seminars, and service-oriented organization. In the context of the study program Online M.Sc. Wind Energy Systems, UNIKIMS is responsible for administering the online teaching environment.

UNIKIMS is also committed to sustainability, collaborating with NGOs such as Moving Windmills and SOS Children's Villages to develop green energy-focused educational programs for developing countries, covering wind, solar, water, biogas, and ecological agriculture.