TECHNISCHE HOCHSCHULE LÜBECK

Module: Renewable Energy

Level	Bachelor	**Short Name**	REN
Responsible Lecturers	Töbermann, J.-Christian, Prof. Dr.-Ing		
Department, Facility	Electrical Engineering and Computer Science		
Course of Studies	Elektrotechnik - Energiesysteme und Automation, Bachelor		
Compulsory/elective	Compulsory	**ECTS Credit Points**	5
Semester of Studies	6	**Semester Hours per Week**	4
Length (semesters)	1	**Workload (hours)**	150
Frequency	SuSe	**Presence Hours**	60
Teaching Language	English	**Self-Study Hours**	90

The following section is filled only if there is **exactly one** module-concluding exam.

Exam Type	Written Exam	**Exam Language**	English
Exam Length (minutes)	120	**Exam Grading System**	One-third Grades

Learning Outcomes	Students: • know fundamentals of the energy industry, the electrical energy system, the electrical grid, and the energy transition. • can explain and evaluate selected technologies of renewable energy generation. • can analyze and assess specific renewable energy generation installations, with focus on photovoltaics systems and wind turbines. • know definitions and concepts of smart grids and sector coupling • analyze and evaluate challenges and opportunities arising from the energy transition and sector coupling on structures and business processes in the energy industry and on the electrical grid. • apply methods and procedures for the integration of renewable generation plants into the electrical power grid and the electrical power system in a purposeful manner.
Participation Prerequisites	

The previous section is filled only if there is **exactly one** module-concluding exam.

Consideration of Gender and Diversity Issues	✔ Use of gender-neutral language (THL standard) ✔ Target group specific adjustment of didactic methods ✘ Making subject diversity visible (female researchers, cultures etc.)
Applicability	
Remarks	

Module Course: Renewable Energy (Lecture)

(of Module: Renewable Energy)

Course Type	Lecture	**Form of Learning**	Presence
Mandatory Attendance	no	**ECTS Credit Points**	4
Participation Limit		**Semester Hours per Week**	3
Group Size		**Workload (hours)**	120
Teaching Language	English	**Presence Hours**	45
Study Achievements ("Studienleistung", SL)		**Self-Study Hours**	75
SL Length (minutes)		**SL Grading System**	

The following section is filled only if there is a course-specific exam.

Exam Type		**Exam Language**	
Exam Length (minutes)		**Exam Grading System**	
Learning Outcomes			
Participation Prerequisites			

The previous section is filled only if there is a course-specific exam.

Contents	• Energy industry, electrical energy system and electrical grid • Climate Change and energy transition • Solar Radiation • Photovoltaic • Solar thermal and concentrated solar • Wind turbines • Hydro power • Prognosis of renewable energy • Grid and system integration of renewable energy • Fundamentals of sector coupling
Literature	V. Quaschning: „Renewable Energy and Climate Change“ (most recent edition) Further literature will be announced in the lecture.
Remarks	

Module Course: Renewable Energy (Practical Training)

(of Module: Renewable Energy)

Course Type	Practical Training	**Form of Learning**	Presence
Mandatory Attendance	yes	**ECTS Credit Points**	1
Participation Limit		**Semester Hours per Week**	1
Group Size	12	**Workload (hours)**	30
Teaching Language	English	**Presence Hours**	15
Study Achievements ("Studienleistung", SL)	Practical Training	**Self-Study Hours**	15
SL Length (minutes)		**SL Grading System**	Pass

The following section is filled only if there is a course-specific exam.

Exam Type		**Exam Language**	
Exam Length (minutes)		**Exam Grading System**	
Learning Outcomes			
Participation Prerequisites			

The previous section is filled only if there is a course-specific exam.

Contents	During the practical trainings, students apply what they have learned in the lecture to selected tasks and application scenarios, e.g. analyzing the behavior of photovoltaic systems and wind turbines, performing a grid integration study
Literature	See lecture.
Remarks	