TÜRK-ALMAN ÜNİVERSİTESİ
TÜRKISCH-DEUTSCHE UNIVERSITÄT

DEPARTMENT OF ENERGY SCIENCE AND TECHNOLOGY
COURSE SYLLABUS

Course Details					
Code			Academic Year		Semester
EBT201			2		3
Title			T	A	L	ECTS
Renewable Energy Technologies			3	1	0	6

Language	German				
Level	Undergraduate	X	Graduate		Postgraduate	
Department / Program	Energy Science and Technology				
Forms of Teaching and Learning	Face-to-face				
Course Type	Compulsory	X	Elective		
Objectives	The aim is to enhance students' knowledge and skills in renewable energy and emerging technologies, enabling them to gain insights into energy management.				
Content	This course covers topics such as meteorology and geographical impacts, wind turbines: their systematics, basic calculations, the structure and behavior of components, electricity-generating wind turbines: application areas, system examples, functional structures, control methods, storage, economic evaluation, legal aspects, Peltier elements, accumulators, fundamentals of photovoltaic systems, fuel cells, and the adaptation and application of DC voltage sources.				
Prerequisites	None				
Coordinator	Asist Prof.Dr. Meltem Karaismailoğlu Elibol				
Lecturer(s)	Asist Prof.Dr. Meltem Karaismailoğlu Elibol				
Assistant(s)	Res. Asst. Elvan Burcu Koşma				
Work Placement	None				

Recommended or Required Reading	
Books / Lecture Notes	Crastan, V. (2012): Elektrische Energieversorgung 1, Springer Verlag. Crastan, V.(2011): Elektrische Energieversorgung 2, Springer Verlag
Other Sources	

Additional Course Material	
Documents	
Assignments	
Exams	

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Course Composition		
Mathematics und Basic Sciences	30	%
Engineering	40	%
Engineering Design	10	%
Social Sciences	-	%
Educational Sciences	-	%
Natural Sciences	20	%
Health Sciences	-	%
Expert Knowledge	-	%

Assessment		
Activity	**Count**	**Percentage (%)**
Midterm Exam	-	-
Quiz	-	-
Assignments	-	-
Attendance	-	-
Recitations	-	-
Projects	1	40
Final Exam	1	60
Total		**100**

ECTS Points and Work Load			
Activity	**Count**	**Duration**	**Work Load (Hours)**
Lectures	14	3	42
Self-Study	11	4	44
Assignments	2	25	50
Presentation / Seminar Preparation	1	1	1
Midterm Exam			
Recitations	14	1	14
Laboratory			
Projects	1	15	15
Final Exam	1	2	2
Total Work Load			**168**
ECTS Points (Total Work Load / Hour)			**6**

Learning Outcomes	
1	Students know selected subfields of energy technology. They can apply basic knowledge to practical questions of technical energy conversion.
2	Students will be able to describe, compare and evaluate technical systems and components for generating energy from solar, wind, biomass, hydrogen, geothermal energy and water.

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3	Defining the physical relationships and technical characteristics of energy production from solar, wind, biomass, hydrogen, geothermal and hydroelectric energy; storage of electricity and its connection with electricity grids distribution.
4	Students understand the principles of the energetic use of renewable energies, know the technical structure and efficiency of different energy systems and can evaluate the technical and economic potential of renewable energy use.
5	They can analyze and make recommendations on technical, energetic, economic and environmental systems for a defined location.
6	Students understand renewable energy technologies so that they can understand the technology and framework conditions and apply them to new questions and evaluate various future options for improving the efficiency of energy supply. They will be able to identify advantages and disadvantages over conventional energy systems.

Weekly Content

1	Introduction to energy systems and sources
2	Energy, sustainability and environment
3	Quantitative evaluation of energy and energy arithmetic
4	Solar Energy Technologies
5	Solar Energy Technologies
6	Geothermal Energy Technologies
7	Biomass Technologies
8	Midterm
9	Hydrogen
10	Fuel Cells
11	Fuel Cells
12	Next Generation Batteries
13	Wind Energy Technologies
14	Hydrothermal Energy Technologies
15	Renewable Energy Integration
16	Final Exam

Contribution of Learning Outcomes to Program Objectives (1-5)

	P1	P2	P3	P4	P5	P6	P7	P8	P9
1	3	1	4	4	4	2	5	5	5
2	3	3	4	5	4	1	5	5	5
3	3	2	4	5	4	1	4	4	5
4	4	1	4	4	4	1	4	3	5
5	4	2	4	4	4	1	2	4	5
6	4	2	4	4	4	1	3	4	5
Contribution Level		1: Low 2: Low-intermediate 3: Intermediate 4: High 5: Very High							

Program Learning Outcomes: With the successful completion of this program, students will be able to

1 : Awareness of the necessity of lifelong learning; accessibility, monitoring and self-adaptation in science and technology.

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2 : Capability to identify, define, formulate and solve energy systems problems; the ability to select and apply appropriate analysis methods for this purpose.

3 : Ability to utilize scientific and engineering knowledge.

4 : Ability to design and conduct experiments and to analyze and interpret data.

5 : Ability to work in groups and perform interdisciplinary research.

6 : The capability to design a system, component, or process to meet applicable constraints (economic, environmental, social, political, ethical, health and safety, manufacturability, and sustainability).

7 : The opportunity to gain theoretical and practical knowledge in the field of energy, as well as the ability to contribute to it by keeping up with the developments.

8 : The ability to have the necessary tools in academic and professional settings, as well as effective communication and responsibility.

9 : Opportunity to gain German language skills to the extent of reading, interpreting, and presenting academic texts.

Compiled by:	Res. Asst. Yusuf Karakaş
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