DEPARTMENT OF ENERGY SCIENCE AND TECHNOLOGY
COURSE SYLLABUS

Course Details								
Code				**Academic Year**			**Semester**	
EBT301				3			Fall	
Title				**T**	**A**	**L**	**ECTS**	
Solar energy systems				2	1	1	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**		**Elective**	**X**		
Objectives						
Content	Solar energy potential, physical principles of photovoltaics, photovoltaic energy conversion with solar cells, components, properties, structure and operating behavior of photovoltaic systems, design and calculation of photovoltaic systems, microinverters for solar modules, applications of electrical energy generation from photovoltaics, new developments					
Prerequisites						
Coordinator						
Lecturer(s)						
Assistant(s)						
Work Placement	No					

Recommended or Required Reading	
Books / Lecture Notes	Course sheets
Other Sources	Markvart, T., Castaner, L., 2003, Practical Handbook of Photovoltaics: Fundamentals and Applications, Elsevier, Oxford, Uk. Meissner, D. 2013, Solarzellen: Physikalische Grundlagen und Anwendungen in der Photovoltaic, Springer-Verlag,

Additional Course Material	
Documents	
Assignments	
Exams	

Course Composition		
Mathematics und Basic Sciences	-	%
Engineering	30	%

DEPARTMENT OF ENERGY SCIENCE AND TECHNOLOGY
COURSE SYLLABUS

Engineering Design	5	%
Social Sciences	-	%
Educational Sciences	-	%
Natural Sciences	5	%
Health Sciences	-	%
Expert Knowledge	70	%

Assessment

Activity	Count	Percentage (%)
Midterm Exam	1	30
Quiz		
Assignments		
Attendance		
Recitations	3	30
Projects		
Final Exam	1	40
	Total	**100**

ECTS Points and Work Load

Activity	Count	Duration	Work Load (Hours)
Lectures	13	2	26
Self-Study	14	8	112
Assignments			
Presentation / Seminar Preparation			
Midterm Exam	1	2	2
Recitations	14	1	14
Laboratory	14	1	14
Projects			
Final Exam	1	2	2
		Total Work Load	**170**
		ECTS Points (Total Work Load / Hours)	**6**

Learning Outcomes

1	Will be able to explain solar radiation and irradiance measuring devices.
2	Can explain solar energy and solar energy systems.
3	Can explain solar cells and solar panels (PV).
4	Can make PV panel connections.
5	Can explain thermal solar energy systems and working principles.

DEPARTMENT OF ENERGY SCIENCE AND TECHNOLOGY
COURSE SYLLABUS

6	Can explain battery and battery groups.
7	Can explain charge regulators.
8	Can explain the inverters and their types.
9	Can explain network connections.
10	Can explain counters.

Weekly Content	
1	Structure of the sun, solar radiation, irradiance measuring devices
2	Solar energy, solar energy systems
3	Solar energy systems
4	Solar energy systems
5	PV panels and connections
6	Thermal solar systems and fittings
7	Batteries, battery groups
8	Midterm
9	Charge regulators
10	Inverters
11	Classification of inverters
12	Network connections
13	Network inputs and outputs
14	Counters
15	Final exam

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

	P1	**P2**	**P3**	**P4**	**P5**	**P6**	**P7**
1	5	5	5	5	3	4	2
2	5	5	5	5	4	3	2
3	5	5	5	5	3	4	2
4	5	5	5	5	4	5	3
5	5	5	5	5	5	5	3
6	5	5	5	5	3	5	5
7	5	5	5	5	3	5	5
8	5	5	5	5	4	5	4
9	5	5	5	5	5	5	5
10	5	5	5	5	5	5	5
Contribution Level	1: Low 2: Low-intermediate 3: Intermediate 4: High 5: Very High						

P1 Working with modern scientific sources.

DEPARTMENT OF ENERGY SCIENCE AND TECHNOLOGY
COURSE SYLLABUS

P2 Having modern scientific knowledge and scientific analysis abilities and being able to apply them to scientific problems.
P3 Having theoretical and practical skills in the area of Energy Science and Technology.
P4 Having foreign language skills to follow the worldwide advancements in the field of Energy Science and Technology and to be able to discuss them with foreign colleagues.
P5 Having computational skills for research data analysis purposes.
P6 Having appropriate skills for academic and industrial jobs, being ready to take responsibility in working life.
P7 Having knowledge about work occupational work and safety.

Compiled by:	Res Asst. Elvan Burcu Kosma
Date of Compilation:	15.05.2023