DEPARTMENT OF ENERGY SCIENCE AND TECHNOLOGY
COURSE SYLLABUS

Course Details				
Code	**Academic Year**			**Semester**
EBT308	3			6
Title	**T**	**A**	**L**	**ECTS**
Applied Research Laboratory in Energy Science	1	0	5	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	With the help of the experiments at the undergraduate level, it is aimed to give the students a laboratory habit and to carry out the lessons in the field of energy practically.					
Content	The content of this course includes synthesis and characterization studies of materials used in the field of energy, along with performance analysis, experimental design, modeling, and economic analysis applications.					
Prerequisites	None					
Coordinator	Asist Prof. Dr. Meltem Karaismailoğlu Elibol					
Lecturer(s)	Asist Prof. Dr. Meltem Karaismailoğlu Elibol					
Assistant(s)	Research Assist. Berat Berkan Ünal Research Assist. Elvan Burcu Koşma Research Assist. Yusuf Karakaş					
Work Placement	None					

Recommended or Required Reading	
Books / Lecture Notes	Experiment sheets and presentations are shared with students as class notes.
Other Sources	

Additional Course Material	
Documents	
Assignments	
Exams	

Course Composition		
Mathematics und Basic Sciences	30	%
Engineering	40	%
Engineering Design	10	%
Social Sciences	-	%

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Educational Sciences	-	%
Natural Sciences	20	%
Health Sciences	-	%
Expert Knowledge	-	%

Assessment

Activity	Count	Percentage (%)
Midterm Exam	-	-
Quiz	-	-
Assignments	-	-
Attendance	-	-
Recitations	14	40
Projects	-	-
Final Exam	1	60
	Total	**100**

ECTS Points and Work Load

Activity	Count	Duration	Work Load (Hours)
Lectures	14	1	14
Self-Study	14	7	98
Assignments	0	0	0
Presentation / Seminar Preparation	0	0	0
Midterm Exam	0	0	0
Recitations	0	0	0
Laboratory	14	5	70
Projects	0	0	0
Final Exam	1	3	3
		Total Work Load	**185**
		ECTS Points (Total Work Load / Hour)	**6**

Learning Outcomes

1	Students will gain the ability to work alone in the laboratory.
2	Students will be able to familiarize themselves with experimental systems and set up their own when necessary.
3	Students will acquire the ability to read and analyze technical writing.
4	Students will gain the ability to solve laboratory problems and system errors.

Weekly Content

1	Laboratory Safety Training
2	Experiment 1 - Electrochemical Coating

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3	Experiment 1 - Electrochemical Coating
4	X-Ray Diffractometer device training
5	Scanning Electron Microscope (SEM) device training
6	Experiment 2-Experimental Design
7	Experimental results evaluation training
8	Midterm week
9	Experiment 3 - Synthesis of Proton-Conducting Ceramic Perovskite Material Using the Sol-Gel Method
10	Experiment 3 - Synthesis of Proton-Conducting Ceramic Perovskite Material Using the Sol-Gel Method
11	Experiment 4 - Investigation of the Effects of Etching and Calcination Applications on Halosite Mineral
12	Experiment 4 - Investigation of the Effects of Etching and Calcination Applications on Halosite Mineral
13	Experiment 5 - Modeling and Economic Analysis of a Solar Tower Power Plant
14	Experiment 5 - Modeling and Economic Analysis of a Solar Tower Power Plant
15	Final exam

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

	P1	P2	P3	P4	P5	P6	P7	P8	P9
1	5	5	5	5	4	5	5	5	3
2	3	5	5	5	4	5	5	5	3
3	5	5	5	5	3	5	5	5	5
4	5	5	5	5	4	5	5	5	3

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.
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. Elvan Burcu Koşma
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