

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					
Language		German			
Level					
Undergraduate		X	Graduate	Postgraduate	
Department / Program					
Department / Program		Energy Science and Technology			
Forms of Teaching and Learning					
Forms of Teaching and Learning		Face to Face			
Course Type					
Compulsory		X	Elective		
Objectives					
Objectives		The aim of this course is to familiarize students with laboratory practices through undergraduate-level experiments and to conduct applied courses in the field of energy.			
Content					
Content		The content of this course includes synthesis and characterization studies of materials used in the energy field, as well as performance analyses. It also covers experimental design, modeling, and economic analysis applications.			
Prerequisites					
Prerequisites		None			
Coordinator					
Coordinator		Assist. Prof. Dr. Meltem Karaismailoğlu Elibol			
Lecturer(s)					
Lecturer(s)		Assist. Prof. Dr. Meltem Karaismailoğlu Elibol			
Assistant(s)					
Assistant(s)		Res.Asst. Anil Can Duman Res.Asst. Berat Berkan Ünal Res.Asst. Kevser Celep Res.Asst. Yusuf Karakaş			
Work Placement					
Work Placement		No			
Recommended or Required Reading					
Books / Lecture Notes					
Books / Lecture Notes		-			
Other Sources					
Other Sources		Experiment Sheets			
Additional Course Material					
Documents					
Documents					
Assignments					
Assignments					
Exams					
Exams					
Course Composition					
Mathematics und Basic Sciences		30		%	
Engineering		40		%	
Engineering Design		10		%	

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

**Assessment**

Activity	Count	Percentage (%)
Midterm Exam		
Quiz		
Assignments		
Laboratory	1	40%
Recitations		
Projects		
Final Exam	1	60%
<b>Total</b>		<b>100</b>

**ECTS Points and Work Load**

Activity	Count	Duration	Work Load (Hours)
Lectures	14	1	14
Self-Study	10	7	70
Assignments			
Presentation / Seminar Preparation			
Midterm Exam			
Recitations			
Laboratory	14	6	84
Projects			
Final Exam	1	1	1
<b>Total Work Load</b>			<b>169</b>
<b>ECTS Points (Total Work Load / Hours)</b>			<b>6</b>

**Learning Outcomes**

1	Students will gain the ability to work independently in the laboratory.
2	Students will gain the ability to recognize experimental systems and set them up when necessary.
3	Students will gain the ability to read and review technical writing.
4	Students will gain the ability to solve laboratory problems and system errors.

**Weekly Content**

1	Laboratory Safety Training
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2	Experiment 1 - Electrochemical Coating
3	Experiment 1 - Electrochemical Coating
4	Learning the X-Ray Diffractometer device
5	Learning the Scanning Electron Microscope (SEM) device
6	Experiment 2 - Experimental Design
7	Experiment 2 - Experimental Design
8	Midterm Exam
9	Learning the evaluation of experimental results
10	Experiment 3 - Synthesis of Proton-Conducting Ceramic Perovskite Material by Sol-Gel Method
11	Experiment 3 - Synthesis of Proton-Conducting Ceramic Perovskite Material by Sol-Gel Method
12	Experiment 4 - Investigating the Effects of Etching and Calcination on Halosite Mineral
13	Experiment 4 - Investigating the Effects of Etching and Calcination on Halosite Mineral
14	Experiment 5 - Modeling and Economic Analysis of Solar Tower Power Plant
15	Experiment 5 - Modeling and Economic Analysis of Solar Tower Power Plant
16	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

**P1 Working with modern scientific sources.**

**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:

Date of Compilation: