DEPARTMENT OF ENERGY SCİENCE AND TECHNOLOGY
COURSE SYLLABUS

Course Details				
Code	**Academic Year**			**Semester**
EBT307	3			5
Title	**T**	**A**	**L**	**ECTS**
Fluid Mechanics	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**	**X**	**Elective**			
Objectives	The aim of this course is to teach raw materials and resources used for the production of heat, electricity, and chemical energy. The course will cover the processes of extracting raw materials and resources as minerals, processing them, and converting them into energy sources. Students will be introduced to all operational stages, from the initial stages of energy systems to recycling and waste management. Information will be provided on thermal, hydroelectric, nuclear, and geothermal systems. Thus, students will develop the ability to understand all transformation steps of a raw material.					
Content	This course covers the definition and classification of raw materials, mineral raw materials, raw materials for environmental protection, raw materials for the energy sector, and zeolites. It includes the identification of surface and underground energy sources, extraction of energy resources and mining processes, raw material utilization methods, energy production systems using raw materials, thermal power plants, geothermal and hydroelectric power plants, nuclear power plants, recycling and the use of waste in thermal power plants, biogas and bio-waste, and uranium ore mining.					
Prerequisites	None					
Coordinator	Assist. Prof. Dr. Gülsüm Gündoğdu					
Lecturer(s)	Assist. Prof. Dr. Gülsüm Gündoğdu Assist. Prof. Dr. Elif Yunt Assist. Prof. Dr. Aslı İşler Kaya Assist. Prof. Dr. Osman Sinan Süslü					
Assistant(s)						
Work Placement	No					

Recommended or Required Reading	
Books / Lecture Notes	LASCHKA, D.; STRIEBEL, T.; DAUB, J.: Platin im Regenabfluß einer Straße. - Umweltwissenschaften und Schadstoff-Forschung, 8(1996)3. RÖSLER, H. J.: Lehrbuch der Mineralogie. - VEB Deutscher Verlag für Grundstoffindustrie, Leipzig 197 HEINTZ, A.; REINHARDT, G.: Chemie und Umwelt. - Vieweg & Sohn, Braunschweig/ Wiesbaden Pohl, W. (2005). Mineralische und Energie-Rohstoffe: eine Einführung zur Entstehung und nachhaltigen Nutzung von Lagerstätten. Schweizerbart.

DEPARTMENT OF ENERGY SCİENCE AND TECHNOLOGY
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	Fundamentals of Materials for Energy and Environmental Sustainability Edited by David Ginley and David Cahen, Cambridge University Press.
Other Sources	GAJEWSKI, W.: Werkstoffe für Katalysatoren im Umweltschutz. - cfi/Ber. DKG, Wiesbaden 68(1991)3. Pohl, W. (2005). Mineralische und Energie-Rohstoffe: eine Einführung zur Entstehung und nachhaltigen Nutzung von Lagerstätten. Schweizerbart

Additional Course Material	
Documents	
Assignments	
Exams	

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

Assessment

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

ECTS Points and Work Load

Activity	Count	Duration	Work Load (Hours)
Lectures	14	2	28
Self-Study	13	8	104
Assignments	1	4	4
Presentation / Seminar Preparation			
Midterm Exam	1	2	2

DEPARTMENT OF ENERGY SCİENCE AND TECHNOLOGY
COURSE SYLLABUS

Recitations	14	1	14
Laboratory	14	1	14
Projects			
Final Exam	1	2	2
		Total Work Load	**168**
		ECTS Points (Total Work Load / Hours)	**6**

Learning Outcomes	
1	Students acquire detailed knowledge about the classification and extraction of raw materials.
2	They learn about the distribution and potential of raw materials in the world and in Turkey.
3	They gain detailed knowledge about the processing and mining of raw materials.
4	They acquire detailed knowledge about the operation and development of power plants.

Weekly Content	
1	Definition and classification of raw materials
2	Classification of raw materials 1
3	Classification of raw materials 2
4	Classification of raw materials 2
5	Classification of raw materials 3
6	Identification of surface and underground energy sources
7	Extraction of energy resources and mining
8	Midterm Exam
9	Methods of raw material utilization
10	Systems for energy production from raw materials
11	Thermal, geothermal, and hydroelectric power plants
12	Nuclear power plants and uranium ore mining
13	Recycling and the use of waste in thermal power plants
14	Biogas and biofuels
15	Biogas and biofuels
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	4	5	5	5		5
2	5	5	5	4	5	5	5		5
3	5	5	5	4	5	5	5		5
4	5	5	5	4	5	5	5		5

Contribution Level	1: Low 2: Low-intermediate 3: Intermediate 4: High 5: Very High

DEPARTMENT OF ENERGY SCİENCE AND TECHNOLOGY
COURSE SYLLABUS

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:	