

Course Code	Course Name	Teorical	Practice	Laboratory	Credits	ECTS
FZK-4030	Alternative Energy Sources	2.00	2.00	0.00	3.00	7.00
Course Detail						
<b>Course Language</b>	: Turkish					
<b>Qualification Degree</b>	: Bachelor					
<b>Course Type</b>	: Optional					
<b>Preconditions</b>	: Not					
<b>Objectives of the Course</b>	: The aim of this course is to teach how to use energy from renewable sources and to learn the properties and application areas of these resources. For this purpose, it is aimed to give the necessary information for every kind of energy analysis and to teach scientific foundations.					
<b>Course Contents</b>	: Renewable and Renewable Energy Plants, Thermal Power Plants, Nuclear Plants, Hydroelectric Power Plants, Solar Power Plants, Sun, Plateau Ventilation and Solar, Solar Constant and Solar Energy System, Wind Power Plant Wind Power Plant and Marine Line and its importance for Turkey, storable and renewable energy sources, Geothermal sources, Biomass and biogas production and storage, Biobenzin and its production, Biomotor and production, Energy security and energy saving.					
<b>Recommended or Required Reading</b>	: 1- Alternatif Enerji Kaynakları, Acaroğlu,M., 2013, Nobel Akademik Yayıncılık. 2- Yenilenebilir Enerji Kaynakları, Öztürk, H. H., 2021, Birsen Yayınevi.					
<b>Planned Learning Activities and Teaching Methods</b>	: Oral presentation, homework, written exam, discussion.					
<b>Recommended Optional Programme Components</b>	: Reading, researching and presenting documents related to the course subject.					
<b>Instructors</b>	: Prof. Dr. İsmail Tarhan					
<b>Instructor's Assistants</b>	: None					
<b>Presentation Of Course</b>	: Face to face					

## Course Outcomes

## Upon the completion of this course a student :

- 1 Classify the Power Plants.
- 2 Define non-renewable energy sources, description, functioning, properties, environmental effects
- 3 Compares the potential of energy resources in our country and in the world.
- 4 Introduces renewable energy resources.
- 5 Gives information about energy security and energy saving.
- 6 Have knowledge about the operation, equipment and energy production capacities of Hydroelectric, Solar, Wind, Geothermal, Biomass, Wave, Hydrogen Power Plants.

## Preconditions

Course Code	Course Name	Teorical	Practice	Laboratory	Credits	ECTS
-------------	-------------	----------	----------	------------	---------	------

Weekly Contents					
	Teorical	Practice	Laboratory	Preparation Info	Teaching Methods
1.Week	*The concept of energy and alternative energy, types and types of energy, exergy and anergy, basic equations and calculations.				*Lecture, question-answer, discussion
2.Week	*The concept of energy and alternative energy, types and types of energy, exergy and anergy, basic equations and calculations.				*Lecture, question-answer, discussion
3.Week	*The concept of energy and alternative energy, types and types of energy, exergy and anergy, basic equations and calculations. *Fossil Fired Power Plants II (Diesel and Nuclear Power Plants)				*Lecture, question-answer, discussion
4.Week	*Hydroelectric Power Plants I *Wind formation, wind types and wind energy calculations.				*Lecture, question-answer, discussion
5.Week	*Hydroelectric Power Plants II *Wind formation, wind types and wind energy calculations.				*Lecture, question-answer, discussion
6.Week	*Solar Power Plants I *Wind turbines, types, working mechanisms and calculations.				*Lecture, question-answer, discussion
7.Week	*Solar Power Plants II *Wind turbines, types, working mechanisms and calculations.				*Lecture, question-answer, discussion
8.Week	*Midterm * The sun and its energy production mechanism, basic equations.				
9.Week	*Wind Power Plants * The sun and its energy production mechanism, basic equations.				*Lecture, question-answer, discussion
10.Week	*Geothermal Power Plants *Wave, strait current and hydro energy and its calculations.				*Lecture, question-answer, discussion
11.Week	*Biomass Power Plants *Wave, strait current and hydro energy and its calculations.				*Lecture, question-answer, discussion
12.Week	*Wave Power Plants *Hydrogen energy, fuel cells and usage areas.				*Lecture, question-answer, discussion
13.Week	*Tidal power plants *Biomass energy and its usage areas.				*Lecture, question-answer, discussion
14.Week	*Hydrogen Power Plants *Efficiency and analysis of alternative energy sources.				*Lecture, question-answer, discussion

Assesment Methods %
2 Final : 60.000
3 Md Term Exam 2 : 20.000
4 Md Term Exam 1 : 20.000

ECTS Workload			
Activities	Count	Time(Hour)	Sum of Workload
Final	1	1.00	1.00
Individual study after lecture	14	1.00	14.00
Preparation for midterm	1	10.00	10.00
Preparation for final	1	6.00	6.00
Field study	14	2.00	28.00
Theoretical Lecturing	14	4.00	56.00
Mid Term Exam 1	1	1.00	1.00
Mid Term Exam 2	1	1.00	1.00
			Total : 117.00
			Sum of Workload / 30 ( Hour ) : 4
			ECTS : 7.00

## Program And OutcomeRelation

	P.O. 1	P.O. 2	P.O. 3	P.O. 4	P.O. 5	P.O. 6	P.O. 7	P.O. 8	P.O. 9	P.O. 10	P.O. 11	P.O. 12	P.O. 13	P.O. 14	P.O. 15	P.O. 16	P.O. 17	P.O. 18	P.O. 19	P.O. 20	P.O. 21	P.O. 22	P.O. 23	P.O. 24
L.O. 1	3	3	3	4	4	4	3	3	4	4	4	5	5	4	4	3	3	4	4	5	5	5	4	4
L.O. 2	3	4	3	4	4	5	3	4	4	4	5	5	3	3	4	3	4	4	5	5	5	4	4	4
L.O. 3	4	4	4	4	5	4	4	4	5	4	5	5	5	3	3	4	4	5	5	5	4	4	4	5
L.O. 4	4	4	4	5	5	4	4	4	4	4	4	4	4	3	4	4	3	4	4	4	4	4	4	5
L.O. 5	3	4	4	5	4	5	4	5	3	4	3	4	4	4	4	4	4	4	3	4	5	5	4	4
L.O. 6	4	4	4	5	4	5	4	5	4	4	4	4	5	4	5	4	4	5	4	5	5	5	4	5

## Ders/Program Çıktıları İlişkisi

P.O. 1	P.O. 2	P.O. 3	P.O. 4	P.O. 5	P.O. 6	P.O. 7	P.O. 8	P.O. 9	P.O. 10	P.O. 11	P.O. 12	P.O. 13	P.O. 14	P.O. 15	P.O. 16	P.O. 17	P.O. 18	P.O. 19	P.O. 20	P.O. 21	P.O. 22	P.O. 23	P.O. 24	P.O. 2
4	4	4	5	4	4	3	4	4	4	4	5	4	4	4	4	4	4	4	5	5	5	4	5	5