Tarih: 11 Eylül 2025 13:23

Department of Electricity and Energy / Department of Electricity and Energy /

Course Code	Course Name	Teorical	Practice	Laboratory	Credits	ECTS
ENR201	HYDROELECTRIC AND THERMAL POWER PLANTS	4.00	0.00	0.00	4.00	4.00

Course Detail

Course Language	:	Turkish
Qualification Degree	:	PreBachelor
Course Type	:	Compulsory
Preconditions	:	Not
Objectives of the Course	:	To explain the history, types, and related power-efficiency calculations of hydroelectric power plants, as well as the special turbine types. To explain energy production from fossil fuels, the structure of thermal power plants, the characteristics of steam turbines, the thermodynamic analyses of thermal power plants, and their environmental impacts.
Course Contents	:	Definitions, history, classification, water wheels, water turbines, penstock, theory, Euler equations, hydraulic power and efficiency, structure of the Pelton turbine, velocity triangles, power and efficiency relations, Francis turbines, classification, turbine structure, components, power and efficiency expressions, draft tube, draft tube efficiency, Kaplan and propeller turbines, their structures, differences between them, power and efficiency expressions, characteristic curves, cavitation in water turbines, causes, and prevention methods, hydroelectric power plants, special turbines, tubular turbine, Banki turbine. Energy conversion, power cycles, power generation from fossil fuels, thermal power plants. Installation characteristics of steam turbines. Washing, turning, lifting of the turbine rotor, electrical leakages and arrangements. Measuring instruments for the specific heat consumption of turbines, their placement, and the calculation of specific heat consumption. Regulation and its characteristics. Commissioning and decommissioning of turbines and turbine failures. Turbine tests. Considerations to be taken into account when ordering a turbine. Cogeneration systems. Thermodynamic and economic analysis of thermal power plants. Environmental impacts of thermal power plants.
Recommended or Required Reading	:	Computer, projector, lecture notes.
Planned Learning Activities and Teaching Methods	:	Lecture, Q&A
Course Instructors	:	Öğr. Gör. Ensar Koşatepe
Presentation Of Course	:	Formal
Update Date	:	9/7/2025 1:46:03 PM
Dosya İndirilme Tarihi	:	9/11/2025

Course Outcomes

Upon the completion of this course a student :

1 Knows the history of hydroelectric power plants, performs power-efficiency analysis, and learns the types of turbines.

2 Performs efficiency analysis of hydroelectric power plants.

3 Explains energy conversion and energy production from fuels.

4 Knows the operating principle of steam turbines and can perform maintenance and repair.

5 Knows the thermodynamic, economic, and environmental impacts of power plants.

Preconditions

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Weekly Contents

	Teorical	Practice	Laboratory	Preparation Info	Teaching Methods	Course Learning Outcomes
1.Week	*Hydraulic Energy and Hydroelectric Power Plants			*textbook, internet videos	*Explanation, Q&A	Ö.Ç.1 Ö.Ç.1
2.Week	*Structure of Hydroelectric Power Plants and Turbines			*textbook, internet videos	*Explanation, Q&A	Ö.Ç.1 Ö.Ç.1
3.Week	*Structure of Hydroelectric Power Plants and Turbines			*textbook, internet videos	*explanation, Q&A	Ö.Ç.1 Ö.Ç.1
4.Week	*Structure of Hydroelectric Power Plants and Turbines			*textbook, internet videos	*Explanation, Q&A	Ö.Ç.1 Ö.Ç.2 Ö.Ç.1 Ö.Ç.2
5.Week	*Structure of Hydroelectric Power Plants and Turbines			*textbook, internet videos	*Explanation, Q&A	Ö.Ç.1 Ö.Ç.2 Ö.Ç.1 Ö.Ç.2
6.Week	*Classification of Hydroelectric Power Plants and Energy Calculation			*textbook, internet videos	*Explanation, Q&A	Ö.Ç.2 Ö.Ç.3 Ö.Ç.2 Ö.Ç.3
7.Week	*Classification of Hydroelectric Power Plants and Energy Calculation			*textbook, internet videos	*Explanation, Q&A	Ö.Ç.2 Ö.Ç.3 Ö.Ç.2 Ö.Ç.3
8.Week	*Midterm Exam					Ö.Ç.1 Ö.Ç.2 Ö.Ç.3
9.Week	*Energy Conversion and Energy Production from Fossil Fuels			*textbook, internet videos	*Explanation, Q&A	Ö.Ç.3 Ö.Ç.3
10.Week	*Energy Conversion and Energy Production from Fossil Fuels			*textbook, internet videos	*Explanation, Q&A	Ö.Ç.3 Ö.Ç.3
11.Week	*Thermal Power Plants, Steam Turbines and Their Structure			*textbook, internet videos	*Explanation, Q&A	Ö.Ç.4 Ö.Ç.4
12.Week	*Thermal Power Plants, Steam Turbines and Their Structure			*textbook, internet videos	*Explanation, Q&A	Ö.Ç.4 Ö.Ç.4
13.Week	*Thermodynamic and Economic Analysis of Thermal Power Plants			*textbook, internet videos	*Explanation, Q&A	Ö.Ç.4 Ö.Ç.4
14.Week	*Environmental Impacts of Thermal Power Plants			*textbook, internet videos	*Explanation, Q&A	Ö.Ç.5 Ö.Ç.5
15.Week	*Environmental Impacts of Thermal Power Plants			*textbook, internet videos		Ö.Ç.5
16.Week	*fınal exam					Ö.Ç.1 Ö.Ç.2 Ö.Ç.3 Ö.Ç.4 Ö.Ç.5

Assesment Methods %

1 Ara Sınav : 40.000

3 Final : 60.000

ECTS Workload

Activities	Count	Time(Hour)	Sum of Workload
Vize	1	1.00	1.00
Final	1	1.00	1.00
Derse Katılım	14	2.00	28.00
Ara Sınav Hazırlık	1	2.00	2.00
Final Sınavı Hazırlık	1	4.00	4.00
Ders Öncesi Bireysel Çalışma	14	1.00	14.00
Ders Sonrası Bireysel Çalışma	14	1.00	14.00
Teorik Ders Anlatım	14	4.00	56.00
		Total :	120.00
		Sum of Workload / 30 (Hour) :	4
		ECTS :	4.00

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
L.O. 1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	5	0	0
L.O. 2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	5	0	0
L.O. 3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	5	0	0
L.O. 4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	4	0	0
L.O. 5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	5	0	0
Avarage	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	4.80	0	0

Engel Durumu/Uyarlama Talebi : Engel durumuna ilişkin herhangi bir uyarlama talebinde bulunmak isteyen öğrenciler, dersin öğretim elemanı ya da Nevsehir Engelli Öğrenci Birimi ile en kısa sürede iletişime geçmelidir.