Year

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

Course Code	Course Name	Teorical	Practice	Laboratory	Credits	ECTS
AEK226	POWER SYSTEMS ANALYSIS	3.00	0.00	0.00	3.00	3.00

Course Detail

Course Language	: Turkish
Qualification Degree	: PreBachelor
Course Type	: Optional
Preconditions	: Not
Objectives of the Course	: Electricity generation, transmission and distribution stages of power system components from the circuit theory knowledge learned from the analysis of mathematical models can perform on the main goals of this course.
Course Contents	: General overview and basic concepts of power systems, power and compensation in single-phase systems, three-phase systems and power analysis, symmetrical components method, application of symmetrical components to three-phase systems and elements such as generators and motors. Per unit systems and single-line impedance diagrams of power systems. Steady-state transmission line models and analysis.
Recommended or Required Reading	: Lecture Notes Analysis of Power Systems, U. Arifoğlu, February 2020, Papatya Science Publications Analysis and Design of Power Systems, J.Duncan Glover, Mulukutla S. Sarma, Thomas J. Overbye Translation: Bahri Ercan, Hasan Dağ, June 2017, Nobel Publishing House
Planned Learning Activities and Teaching Methods	: Lecture, Laboratory experiments, Demonstration and practice, Problem-solving, Hands-on application, Individual and group work, Creative thinking development
Recommended Optional Programme Components	: Students should not be absent, keep regular notes and do research.
Course Instructors	: Öğr. Gör. Tahir Karakoç
Instructor's Assistants	: Lecturer Tahir Karakoç
Presentation Of Course	: Face to face
Update Date	: 2/7/2026 11:23:05 PM
Dosya İndirilme Tarihi	: 2/7/2026

Course Outcomes

Upon the completion of this course a student :

1 Describe the structure and basic components of power systems.

2 Be able to perform three-phase foundation calculations.

3 Be able to design transmission line models of power systems.

4 Be able to analyze the power system using the Symmetrical Components Method and Unit System.

5 Define power flow and explain power flow methods.

Pre / Side Conditions

Course Code	Course Name	Condition	Teorical	Practice	Laboratory	Credits	ECTS

Weekly Contents

	Teorical	Practice	Laboratory	Preparation Info	Teaching Methods	Course Learning Outcomes
1.Week	*Structure of power systems and basic concepts			*Do preliminary work on pages 1-14 of the course notes.	*Explanation, Problem Solving, Question-Answer	Ö.Ç.1
2.Week	*Current, voltage and power relationships in three phase systems			*Study pages 15-19 of the course notes.	*Explanation, Problem Solving, Question-Answer	Ö.Ç.2
3.Week	*Current, voltage and power relationships in three phase systems			*Study pages 20-23 of the course notes.	*Explanation, Problem Solving, Question-Answer	Ö.Ç.2
4.Week	*Current, voltage and power relationships in three phase systems			*Study pages 24-27 of the course notes.	*Explanation, Problem Solving, Question-Answer	Ö.Ç.2
5.Week	*Symmetrical Components Method and its application to three phase systems			*Study pages 27-30 of the course notes.	*Explanation, Problem Solving, Question-Answer	Ö.Ç.4
6.Week	*Symmetrical Components Method and its application to three phase systems			*Study pages 30-32 of the course notes.	*Explanation, Problem Solving, Question-Answer	Ö.Ç.4
7.Week	*Sequential circuits of loads, generators and motors			*Study pages 33-37 of the course notes.	*Explanation, Problem Solving, Question-Answer	Ö.Ç.4
8.Week	*Midterm Exam					
9.Week	*Per-Unit System and its application to power systems			*Study pages 37-42 of the course notes.	*Explanation, Problem Solving, Question-Answer	Ö.Ç.4
10.Week	*Per-Unit System and its application to power systems			*Study pages 43-47 of the course notes.	*Explanation, Problem Solving, Question-Answer	Ö.Ç.4
11.Week	*Per-Unit System and its application to power systems			*Study pages 48-53 of the course notes.	*Explanation, Problem Solving, Question-Answer	Ö.Ç.4
12.Week	*Short distance power system transmission line model			*Study the 53-61 page range of the course notes.	*Explanation, Problem Solving, Question-Answer	Ö.Ç.1 Ö.Ç.2 Ö.Ç.3
13.Week	*Medium distance power system transmission line model			*Study the 62-67 page range of the course notes.	*Explanation, Problem Solving, Question-Answer	Ö.Ç.1 Ö.Ç.2 Ö.Ç.3
14.Week	*Transmission line model of long distance power system			*Study within the 68-73 page range of the course notes.	*Explanation, Problem Solving, Question-Answer	Ö.Ç.1 Ö.Ç.2 Ö.Ç.3
15.Week	*Power flow and basic concepts			*Study between pages 74-80 of the course notes.	*Explanation, Problem Solving, Question-Answer	Ö.Ç.5

Assesment Methods %

2 Final : 100.000

ECTS Workload

Activities	Count	Time(Hour)	Sum of Workload
Vize	1	1.00	1.00
Final	1	1.00	1.00
Teorik Ders Anlatım	14	3.00	42.00
Ara Sınav Hazırlık	3	3.00	9.00
Final Sınavı Hazırlık	3	4.00	12.00
Ders Öncesi Bireysel Çalışma	10	1.00	10.00
Ders Sonrası Bireysel Çalışma	10	1.00	10.00
Ödev	5	1.00	5.00
		Total :	90.00
		Sum of Workload / 30 (Hour) :	3
		ECTS :	3.00

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. 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
L.O. 1	5	1	2	1	3	1	1	1	0	0	2	2	5	1
L.O. 2	5	0	1	1	4	1	1	1	0	0	2	3	5	1
L.O. 3	4	0	2	2	5	1	1	2	0	0	3	3	5	1
L.O. 4	4	0	2	2	5	1	1	2	0	0	4	3	5	1
L.O. 5	4	0	2	2	5	1	1	2	0	0	4	4	5	1
Avarage	7.80	2.40	4.80	5.00	7.00	2.80	3.80	5.20	2.40	1.40	4.60	5.80	7.80	3.60

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
17	11	15	17	13	9	14	18	12	7	8	14	14	13

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.