AEK223 - ALTERNATİNG CURRENT CİRCUİT ANALYSİS - Meslek Yüksekokulu - Elektrik ve Enerji Bölümü

General Info

Objectives of the Course

The purpose of this course is to provide knowledge and skills regarding the basic concepts of alternating current and the analysis of alternating current circuits.

Course Contents

Alternative current structure and basic concepts, basic alternating current circuits, serial alternating current circuit and voltage law, parallel alternating current circuits and current law, series-parallel alternating current circuits, alternating current circuit theorems, alternating current circuit theorems, compensation and three-phase circuits.

Recommended or Required Reading

1. Lecture notes 2. Karakoç, T. Alternating Current Circuit Analysis, January 2018, Konya - Eğitim Publishing House Recommended Resources: Yağımlı, M. Akar, F. Alternating Current Circuits and Problem Solutions; June 2002, 1st Edition, Istanbul Beta Printing Publishing Distribution Inc.

Planned Learning Activities and Teaching Methods

Lecture, question-answer, problem solving, practice, simulation, demonstration, experiment, group work, slide, homework

Recommended Optional Programme Components

Using a scientific calculator, preparing before class, reviewing after class, completing homework on time, practicing with extra problem solving, and paying attention to absences.

Instructor's Assistants

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Presentation Of Course

Face To Face

Dersi Veren Öğretim Elemanları

Inst. Tahir Karakoç

Program Outcomes

1. Can explain the basic concepts and characteristics of alternating current.
2. Can use basic laws and theories in the solution of alternating current circuits.
3. Can make power and compensation calculations in alternating current circuits.
4. Can analyze three-phase circuits.
5. Can express the magnitudes in alternating current as phasor.

Weekly Contents

Order	PreparationInfo	Laboratory	TeachingMethods	Theoretical	Practise
1	Studying pages 1-27 of the course notes	Introduction of the oscilloscope device	Lecture, question-answer, practice, problem solving	Structure, properties and characteristic values of sinusoidal signals	Examining and measuring AC signals with an oscilloscope
2	Study the 28-68 page range of the course notes.	Introduction of AC measuring devices	Lecture, question-answer, problem solving, application	Phasors, basic circuit elements in the frequency domain and the concept of impedance	Measurements of circuit elements' response to AC
3	Study within the 69-80 page range of the course notes.	Current, voltage and impedance measurements in AC series and parallel circuits	Narration, question-answer, problem solving	Analysis of series and parallel circuits in phasor domain using Kirchhoff's Laws	Sample problem solutions
4	Study the 81-94 page range of the course notes.	Current-voltage measurements in mixed-connection circuits	Narration, question-answer, problem solving	Analysis of mixed connected AC circuits in phasor domain	Sample problem solutions
5	Study within the 95-103 page range of the course notes.	Examining the results on an oscilloscope	Narration, question-answer, problem solving	AC circuit analysis in phasor environment using the mesh current method	Sample problem solutions
6	Study the 104-112 page range of the course notes.	Testing sample solutions with measuring devices	Narration, question-answer, problem solving	AC circuit analysis in phasor environment using Node Voltage method	Sample problem solutions
7	Study the 113-127 page range of the course notes.	Testing sample solutions with measuring devices	Narration, question-answer, problem solving	AC circuit analysis in the phasor domain using the Superposition Theorem and Source Transformation Method	Sample question solutions
8				Midterm Exam	
9	Study the 128-134 page range of the course notes.	Testing sample solutions with measuring devices	Narration, question-answer, problem solving	AC circuit analysis in frequency domain using Thevenin's Theorem	Sample question solutions
10	Study the 135-139 page range of the course notes.	Testing sample solutions with measuring instruments	Narration, question-answer, problem solving	AC circuit analysis in frequency domain using Norton's Theorem	Sample question solutions
11	Study the 140-164 page range of the course notes.	Inspection of power and energy measuring devices	Narration, question-answer, problem solving	Power Analysis in Alternating Current	Sample problem solutions
12	Study the 165-191 page range of the course notes.	Testing sample question solutions with measuring devices	Narration, question-answer, problem solving	Maximum power transfer, power triangle and general problem solutions	Sample question solutions
13	Study the 192-206 page range of the course notes.	Introduction of power factor meter	Lecture, question-answer, problem solving, application	Power factor correction	Sample question solutions and measuring the power factor
14	Study the 210-247 page range of the course notes.	Introduction of measuring devices used in three-phase systems	Lecture, question-answer, problem solving, application	Balanced three-phase circuit analysis	Sample question solutions and three-phase measurements
15	Study the 248-260 page range of the course notes.	Introduction of measuring devices used in three-phase systems	Lecture, question-answer, problem solving, application	Power analysis in balanced three-phase circuits	Sample question solutions and three-phase measurements

Workload

Activities	Number	PLEASE SELECT TWO DISTINCT LANGUAGES
Vize	1	1,00
Final	1	1,00
Ara Sınav Hazırlık	7	2,00
Final Sınavı Hazırlık	9	2,00
Teorik Ders Anlatım	14	2,00
Uygulama / Pratik	14	1,00
Ders Öncesi Bireysel Çalışma	14	1,00

Assesments

Activities	Weight (%)
Ara Sınav	40,00
Final	60,00

Elektrik ve Enerji Bölümü / ALTERNATİF ENERJİ KAYNAKLARI TEKNOLOJİSİ X Learning Outcome Relation

	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	3	2	3	2	1	1	1		3	3	5	4
L.O. 2	5	1	3	2	5	2	2	1	1		3	3	5	4
L.O. 3	5	2	3	2	4	2	2	1	1		4	5	5	4
L.O. 4	5	2	3	2	4	2	2	1	1		5	5	5	4
L.O. 5	5	1	3	2	4	2	1	1	1		4	4	5	4

Table :

P.O. 1 : Mesleği ile ilgili temel, güncel ve uygulamalı bilgilere sahip olur.

P.O. 2 : İş sağlığı ve güvenliği, çevre bilinci ve kalite süreçleri hakkında bilgi sahibi olur.

P.O. 3 : Mesleği için güncel gelişmeleri ve uygulamaları takip eder, etkin şekilde kullanır.

P.O. 4 : Mesleği ile ilgili bilişim teknolojilerini (yazılım, program, animasyon vb.) etkin kullanır.

P.O. 5 : Mesleki problemleri ve konuları bağımsız olarak analitik ve eleştirel bir yaklaşımla değerlendirme ve çözüm önerisini sunabilme becerisine sahiptir.

P.O. 6 : Bilgi ve beceriler düzeyinde düşüncelerini yazılı ve sözlü iletişim yolu ile etkin biçimde sunabilir, anlaşılır biçimde ifade eder.

P.O. 7 : Alanı ile ilgili uygulamalarda karşılaşılan ve öngörülemeyen karmaşık sorunları çözmek için ekip üyesi olarak sorumluluk alır.

P.O. 8 : Kariyer yönetimi ve yaşam boyu öğrenme konularında farkındalığa sahiptir.

P.O. 9 : Alanı ile ilgili verilerin toplanması, uygulanması ve sonuçlarının duyurulması aşamalarında toplumsal, bilimsel, kültürel ve etik değerlere sahiptir.

P.O. 10 : Bir yabancı dili kullanarak alanındaki bilgileri takip eder ve meslektaşları ile iletişim kurar.

P.O. 11 : Alternatif enerji sistemleri için otomasyon ve kontrol sistemleri tasarlar ve uygular.

P.O. 12 : Enerji tasarruf yöntemleri ve enerji verimliliği ile ilgili hesaplama ve uygulama becerisi kazanır.

P.O. 13 : Elektrik devreleri, güç sistemleri ve elektronik sistemler hakkında bilgi sahibi olur.

P.O. 14 : Alternatif enerji sistemlerinin kurulumunu ve bakımını yapabilme becerisi kazanır.

L.O. 1 : Alternatif akımın temel kavramlarını ve özelliklerini açıklayabilir.

L.O. 2 : Alternatif akım devrelerinin çözümünde temel kanunları ve teoremleri kullanablir.

L.O. 3 : Alternatif akım devrelerinde güç ve kompanzasyon hesaplarını yapabilir.

L.O. 4 : Üç fazlı devrelerin analizini yapabilir.

L.O. 5 : Alternatif akımdaki büyüklükleri fazör olarak ifade edebilir.