

General Info

Objectives of the Course

To provide the ability to analyze direct current circuits using basic theorems and circuit solution methods in electrical and electronics science.

Course Contents

Current-voltage concepts, dc circuit elements, ohm and kichhoff's laws, power and energy, circuit models, circuit analysis methods, circuit theorems, storage elements in direct current and transient analysis.

Recommended or Required Reading

Textbook: Assoc. Prof. Dr. Emre KIYAK - Lecturer İşıl YAZAR, Assoc. Prof. Dr. Asuman ÖZGER, Assoc. Prof. Dr. Semih ERGIN, Prof. Dr. Osman PARLAKTUNA, (2012).

Circuit Analysis, Eskişehir, Anadolu University Web-Offset Facilities / Materials: Projector and experiment sets/ Tahir KARAKOÇ. (2019). Direct Current Circuit Analysis.

Ankara: Seçkin Publishing House, Mustafa YAĞIMLI and Fevzi AKAR. (2004). Direct Current Circuits and Problem Solutions. İstanbul Beta Printing Publishing Distribution Inc.

Planned Learning Activities and Teaching Methods

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

Recommended Optional Programme Components

Doing the assigned homework on time, doing it again after class, preparing for the relevant topic before class, and not being absent.

Instructor's Assistants

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Presentation Of Course

Face to face

Dersi Veren Öğretim Elemanları

Inst. Tahir Karakoç

Program Outcomes

1. Explain basic circuit elements and their properties.
2. Be able to analyze circuits using the Basic Laws.
3. Can do to perform circuit analysis by using node tension method.
4. Be able to perform circuit analysis using circuit theorems.
5. Perform transient analysis of energy storage elements in direct current.

Weekly Contents

Order	Preparation	Info	Laboratory	Teaching Methods	Theoretical	Practise
1	Studying within the 3-10 page range of the textbook	Introduction of the multimeter device	Lecture, question-answer, problem solving, demonstration, experiment	Units, Conductor-Insulator, Electric Charge, Current-Voltage and Resistors	Current, voltage and resistance measurement	
2	Study the textbook to page 11-16	Introducing and testing the power meter and sources	Lecture, question-answer, problem solving, experiment, demonstration	Power-Energy, Direct Current Sources and Ohm's Law	Güç ve enerji ölçümü yapmak	
3	Studying within the 23-42 page range of the textbook	Testing two sample circuits, serially connected and parallel connected, with a measuring device	Lecture, question-answer, problem solving, application	Kirchhoff's Laws, Series-Parallel Circuits, Voltage and Current Divider Rules, Equivalent Resistance Calculation in Mixed Circuits	Making connections between two separate circuits, series and parallel	
4	Studying within the 51-65 page range of the textbook	Testing circuit connections in sample questions	Lecture, question-answer, problem solving	Node Voltage Method, Loop Current Method and sample question solutions	Implementation of circuit connections for sample questions	
5	Studying within the 73-80 page range of the textbook	Testing circuit connections in sample questions	Lecture, question-answer, problem solving	Source Transformation Method, Maximum Power Transfer Theorem, Superposition Theorem and related sample problem solutions	Making circuit connections for sample questions	

Order	Preparation	Info	Laboratory	Teaching Methods	Theoretical	Practise
6	Studying pages 81-83 of the textbook	Testing the results of the solved question circuits as an example	Narration, question-answer, problem solving	Thevenin Theorem and sample question solutions		Making circuit connections for questions related to the subject
7	Studying the 83-86 page range of the textbook	Testing relevant sample question solutions with devices	Lecture, question-answer, problem solving	Norton Theorem and sample question solutions		Making circuit connections for related sample questions
8	Midterm Exam					
9	Studying within the 95-100 page range of the textbook	Introduction of the capacitor	Lecture, question and answer, practice, demonstration, problem solving	The structure of the capacitor, its working principle, its properties, its capacity, the factors affecting its capacity and its behavior towards direct current.		Charging the capacitor and measuring its capacity
10	Studying pages 101-108 of the textbook	capacitor durability test	Lecture, question and answer, practice, demonstration, problem solving	Capacitor types and their usage areas, capacitor connections, current-voltage relationship in a capacitor and calculation of the energy stored in a capacitor.		Making capacitor connections
11	Studying pages 109-115 of the textbook	Observation and examination of coil types	Lecture, question-answer, problem solving, demonstration, practice	The structure of the coil, its operating principle, properties, inductance, types, behavior against direct current, connection types, current-voltage relationship, stored energy calculation and areas of use.		Making coil connections, measuring inductance and performing durability tests
12	Studying the 121-125 page range of the textbook	Observing the current-voltage change in an RL circuit	Lecture, question-answer, problem solving, experiment	Properties and analysis of RL circuits		Making current-voltage measurements of the RL circuit
13	Studying within the 125-130 page range of the textbook	Observing the current-voltage change in an RC circuit	Lecture, question-answer, problem solving, experiment	Properties and analysis of RC circuits		Making current-voltage measurements of the RC circuit
14	Studying the 130-137 page range of the textbook	Testing the setup and connections of sample question circuits.	Lecture, question-answer, problem solving, practice, experiment	Generalized RL Circuits and example solutions		To install and connect sample question circuits.
15	Studying pages 137-141 of the textbook	Testing the installation and connections of sample question circuits	Lecture, question-answer, problem solving, application	Generalized RC Circuits and example solutions		Installing and connecting sample question circuits

Workload

Activities	Number	PLEASE SELECT TWO DISTINCT LANGUAGES
Vize	1	1,00
Final	1	1,00
Ara Sınav Hazırlık	3	5,00
Final Sınavı Hazırlık	3	5,00
Uygulama / Pratik	14	1,00
Teorik Ders Anlatım	14	3,00
Ders Öncesi Bireysel Çalışma	14	1,00
Ödev	9	2,00

Assesments

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

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

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 farkındalık 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 tasarılar 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 : Temel devre elemanlarını ve özelliklerini açıklayabılır.

L.O. 2 : Temel Kanunları kullanarak devre analizini yapabilir.

L.O. 3 : Klasik devre çözüm yöntemlerini kullanarak devre analizini gerçekleştirebilir.

L.O. 4 : Devre teoremlerini kullanarak devre analizini gerçekleştirebilir.

L.O. 5 : Doğru akımda enerji depolama elemanlarının geçici rejim analizini yapabilir.