

<b>Course Description</b>					
<b>Name</b>	<b>Code</b>	<b>Semester</b>	<b>T+A Hour</b>	<b>Credit</b>	<b>ECTS</b>
ELECTRICAL CIRCUITS	COE2146020	Fall Semester	3+2	4	8
<b>Prerequisites Courses</b>	FİZİK II; FİZİK II LAB				
<b>Recommended Elective Courses</b>					
<b>Language of Instruction</b>	English				
<b>Course Level</b>	First Cycle (Bachelor's Degree)				
<b>Course Type</b>	Required				
<b>Course Coordinator</b>	Assoc.Prof. Muhammed Fatih TOY				
<b>Name of Lecturer(s)</b>	Assoc.Prof. Muhammed Fatih TOY				
<b>Assistant(s)</b>					
<b>Aim</b>	To analyze and design linear electric circuits made of resistors, capacitors, inductors, and operational amplifiers.				
<b>Course Content</b>	This course contains; Basic circuit concepts (Charge, DC/AC current, voltage, power, energy, circuit elements),Basic laws (Ohm's law, Kirchof's laws, series/parallel resistor connections),Methods of analysis (Nodal analysis, mesh analysis),Circuit theorems 1 (Superposition, Thevenin, Norton theorems),Circuit theorems 2 (Superposition, Thevenin, Norton theorems),Operational amplifiers 1 (Ideal op-amp, inverting amplifier, noninverting amplifier, summing amplifier, difference amplifier),Operational amplifiers 2 (Ideal op-amp, inverting amplifier, noninverting amplifier, summing amplifier, difference amplifier),Capacitors and inductors 1 (Series and parallel connections, integrator, differentiator) ,Capacitors and inductors 2 (Series and parallel connections, integrator, differentiator),First order circuits 1 (Source free R-C and R-L circuits, step response of R-C and R-L circuits, first order op-amp circuits),First order circuits 2 (Source free R-C and R-L circuits, step response of R-C and R-L circuits, first order op-amp circuits),Second order circuits 1 (Source free R-L-C circuits, step response of R-L-C circuits, general second order circuits, second order op-amp circuits),Second order circuits 2 (Source free R-L-C circuits, step response of R-L-C circuits, general second order circuits, second order op-amp circuits),Second order circuits 3 (Source free R-L-C circuits, step response of R-L-C circuits, general second order circuits, second order op-amp circuits).				
<b>Course Learning Outcomes</b>			<b>Teaching Methods</b>	<b>Assessment Methods</b>	
1. Students can apply basic laws of electric circuits.			1, 13	A, C	
2. Students can analyze DC electric circuits.			1, 13	A, C	
3. Students can explain the behavior of DC Op-Amp circuits.			1, 13	A, C	
4. Students can formulate the behavior of inductor and capacitor circuits.			1, 13	A, C	
5. Students can analyze and design first and second order circuits.			1, 13	A, C	
<b>Teaching Methods</b>	1: Lecture, 13: Experiment / Laboratory				
<b>Assessment Methods</b>	A: Written Exam, C: Homework				
<b>Lecture Schedule</b>					
<b>Sequence</b>	<b>Topics</b>	<b>Preliminary Preparation</b>			
1	Basic circuit concepts (Charge, DC/AC current, voltage, power, energy, circuit elements)				
2	Basic laws (Ohm's law, Kirchof's laws, series/parallel resistor connections)				
3	Methods of analysis (Nodal analysis, mesh analysis)				
4	Circuit theorems 1 (Superposition, Thevenin, Norton theorems)				
5	Circuit theorems 2 (Superposition, Thevenin, Norton theorems)				
6	Operational amplifiers 1 (Ideal op-amp, inverting amplifier, noninverting amplifier, summing amplifier, difference amplifier)				
7	Operational amplifiers 2 (Ideal op-amp, inverting amplifier, noninverting amplifier, summing amplifier, difference amplifier)				
8	Capacitors and inductors 1 (Series and parallel connections, integrator, differentiator)				
9	Capacitors and inductors 2 (Series and parallel connections, integrator, differentiator)				
10	First order circuits 1 (Source free R-C and R-L circuits, step response of R-C and R-L circuits, first order op-amp circuits)				
11	First order circuits 2 (Source free R-C and R-L circuits, step response of R-C and R-L circuits, first order op-amp circuits)				
12	Second order circuits 1 (Source free R-L-C circuits, step response of R-L-C circuits, general second order circuits, second order op-amp circuits)				
13	Second order circuits 2 (Source free R-L-C circuits, step response of R-L-C circuits, general second order circuits, second order op-amp circuits)				
14	Second order circuits 3 (Source free R-L-C circuits, step response of R-L-C circuits, general second order circuits, second order op-amp circuits)				
<b>Evaluation Methods</b>		<b>Weight(%)</b>			
Midterm Exam		30			
General Exam		70			

<b>Resources</b>
Fundamentals of Electric Circuits, by C. K. Alexander and M. N. O. Sadiku, 5th edition. Electrical Engineering 101, D. Ashbey, 3rd edition