



MARMARA UNIVERSITY - FACULTY OF ENGINEERING

2017-2018 Fall

EE2031 Electric Circuits

COURSE DESCRIPTION FORM

Offering Department	Department of Computer Engineering		Undergraduate must course (3rd semester)					
Course Code	EE2031							
Course Name	Electric Circuits							
Language of Instruction	English							
ECTS	5							
Contact Hours	Theoretical (T): 3	Practice (U): 0	Laboratory (L): 0					
Pre-requisites	PHYS1102 Physics II							
Instructor	Name	Çiğdem Eroğlu Erdem						
	E-mail	cigdem.erdem@marmara.edu.tr						
Course Materials	Mandatory	Lecture slides and announcements will be shared via the class web page.						
	Recommended	James W. Nilsson, Susan A. Riedel, "Electric Circuits", 10th edition, Prentice Hall. 2015.						
Course Objectives	The goal of this course is to teach the student basic electric circuits and models of elements. The students will be able to analyze basic circuits using their mathematics and basic sciences knowledge.							
Course Content	Definition and modeling of charge, current, power and energy concepts; ideal circuit elements; independent and dependent voltage and current sources; Kirchhoff's voltage and current laws; analysis of resistive circuits; Mesh-current and node-voltage methods; Thevenin and Norton equivalent circuits; operational amplifier circuits; capacitor and inductor circuit elements; analysis of first order circuits containing capacitor and inductor; sinusoidal steady state analysis; phasors; frequency domain analysis of circuits.							
Learning Outcomes	LO1	Explain and use basic electrical concepts such as current, voltage, power, and energy.						
	LO2	Apply basic circuit analysis methods (Kirchhoff's laws, node-voltage, mesh-current methods etc.) to circuits that contain independent and dependent sources.						
	LO3	Analyze/design circuits that contain operational amplifiers and basic circuit elements.						
	LO4	Analyze first order circuits that contain capacitor and inductor.						
	LO5	Apply frequency domain analysis methods to circuits that contain sinusoidal sources.						
Program Outcomes		LO1	LO2	LO3	LO4	LO5		
PO2	Ability to identify, formulate, and solve complex engineering problems (a); ability to select and apply proper analysis and modelling methods for this purpose (b).			a b				
PO13	Knowledge of mathematics, basic sciences (a), computer science (b) and engineering sciences (c) required for the design and analysis of complex electrical and electronic devices, software and systems including hardware and software.		c		c	c	c	
Subjects (Knowledge, Skills and Behaviours), Contributions of Subjects to Learning Outcomes, Assessment Methods	No	Week	Subjects	LO1	LO2	LO3	LO4	LO5
	S1	1	Review: solving systems of linear equations, complex numbers.					
	S2	2	Basic circuit elements, definitions of current, voltage, power and energy	MF				
	S3	3	Voltage and current sources, resistors, Kirchhoff's laws.		MF, Q			
	S4	4	Basic resistive circuits, current and voltage division, Wheatstone bridge, delta-to-wye conversion.		MF			
	S5	5	Node-voltage method for circuit analysis		MF			
	S6	6	Mesh-current method for circuit analysis		MF			
	S7	7	Source transformations, maximum power transfer, Thevenin and Norton equivalent circuits.		MF			
	S8	8	Operational amplifier circuits			MF, Q		
	S9	9	Inductance and capacitance				MF	
	S10	10-11	Analysis of first order RL and RC circuits, sequential switching				MF, Q	
	S11	12-13	Steady-state analysis, phasors, impedance, application of Kirchhoff's rules, node-voltage and mesh-current methods in the frequency domain.					MF, Q
S12	14	Sinusoidal steady-state power calculations					MF	
Assessment Methods and Weights	No	Type	Weight	Implementation Rule		Make-up Rule		
	MF	Midterm, Final	90%	There will be two midterms and a final exam. Exams will be closed		Marmara University regulations will be followed for make-up exams		

				boks and notes. Claculators are allowed.												
	Q	Quiz	10%	There will be at least three quizzes. The lowest quiz grade of each student will not be taken into account.	-											
	TOTAL		100%													
Determining Letter Grades	<ul style="list-style-type: none"> The letter grades will be determined based on the midterm and final exams, and quizzes. In order to determine the letter grade, a curve or catalog based method will be followed based on the total average scores of the students. The final exam score and the total average score of the student must be at least 35 to pass the course. According to Marmara University Undergraduate regulations, the weight of the final exam must be at least 40 out of 100. 															
	<table border="1"> <thead> <tr> <th>Assessment</th> <th>Midterm 1</th> <th>Midterm 2</th> <th>Final</th> <th>Quizzes</th> <th>TOTAL</th> </tr> </thead> <tbody> <tr> <td>Weight</td> <td>25</td> <td>25</td> <td>40</td> <td>10</td> <td>100</td> </tr> </tbody> </table>					Assessment	Midterm 1	Midterm 2	Final	Quizzes	TOTAL	Weight	25	25	40	10
Assessment	Midterm 1	Midterm 2	Final	Quizzes	TOTAL											
Weight	25	25	40	10	100											
Teaching Method, Student Work Load	Time Applied by the Instructor															
	No	Method	Explanation		Hours											
	1	Lectures	Lectures are given in class using the board or via presentations. Example questions are solved to enhance the concepts.		14x3=42											
	2	Problem Session/ Practice	Problems related to the course topics are solved on the board.													
	3	Laboratory	Experiments are done in the laboratory or theoretical concepts covered during the lectures are practiced using computer exercises.													
	4	Interactive Courses	Questions are asked to students during lectures and they are encouraged to guess the answers (peer learning is also in this category)													
	5	Field Work	Students attend activities outside the campus.													
	6	Midterm	Midterm exam is given during the midterm week.		2											
	7	Final	Final exam is given during the final exam week.		2											
	Estimated Time to be Allocated by a Student															
	8	Project	The students carry out research about the problem given in the project, design and implement their solution and prepare a report.													
	9	Homeworks	The students solve the problems given as homework.													
	10	Pre-class learning of Course Material	The students study and learn the new subjects from course materials.													
11	Review of Course Material	Students review the course subjects from course materials to prepare for the exams and homeworks.		76												
12	Office Hour	Students ask questions to the instructor or the assistant during office hours.		2												
Total				124												
Academic Honesty	Violations of scholastic honesty include, but are not limited to cheating, plagiarizing, fabricating information or citations, facilitating acts of dishonesty by others, having unauthorized possession of examinations, submitting work of another person or work previously used without informing the instructor, or tampering with the academic work of other students.															
	In case academic dishonesty is observed, the first authority is the instructor of the course. The instructor may decide to give the student zero for the homework(s)/lab(s)/exam(s), give the letter grade FF, or may take disciplinary action.															