

DEPARTMENT OF MECHATRONICS ENGINEERING

Course Details												
Code					Academic Year			Semester				
MEC213						2		Spring				
Title						L	ECTS					
Electrical Networks I					1	2	6	6				
Language	English	English										
Level	Undergraduate		Postgraduate									
Department / Program	Mechactronics Engineering											
Forms of Teaching and Learning	Formal											
Course Type	Compulsory		\checkmark	Ele	Elective							
Objectives	 The aim of this module is to provide students with the basics of electrical circuit technology with direct current and alternating current. Graduates will master the analytical calculation methods in the time and frequency domain to be applied for the analysis of electronic circuits in the upcoming relevant electrical engineering subjects. Technical competence: 60% Methodological competence: 15% System competence: 15% Social competence: 10% 											
Content	Continuation of DC circuit analysis with resistors, equivalent sources, superposition theorem, inductance and capacitance, switching operations with inductor and capacitor, operational amplifiers, RC, RL elements, RLC circuits, parallel and series resonance, AC technology.											
Prerequisites	-											
Coordinator	Assoc. Prof. Dr. Serhat İkizoğlu											
Lecturer(s)	Assoc. Prof. Dr. Serhat İkizoğlu											
Assistant(s)	R. A. Fatih Çögen, R. A. Oğuzhan Memişoğlu											
Work Placement	-											
Recommended or Required Reading												
Books / Lecture Notes	 Grundlagen der Elektrotechnik 1-2, M. Albach, Pearson, 2011 Elektrotechnik für Ingenieure 1-2, W. Weißgerber, Springer, 2015 Electric Circuits, JW Nilsson, S Riedel, Pearson, 2015 											
Other Sources												
Additional Course Material												
Documents												
Assignments	1-2 Assignments											
Exams	1 Midterm, 1 Final Exam											
Course Composition												



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Sciences	nd Basic	30	%				
Engineering		30	%				
Engineering Des	sign		%				
Social Sciences				%			
Educational Scie	ences		%				
Natural Science	S		%				
Health Sciences			%				
Expert Knowled	ge	40	%				
Assessment							
Acti	vity	Percentage (%)					
Midterm Exam		1	30				
Quiz							
Assignments							
Attendance							
Recitations/Lab		1	10				
Projects							
Final Exam		1	60				
		100					
ECTS Points and Work Load							
ECTS Points ar	nd Work Load						
ECTS Points ar Acti	nd Work Load vity	Count	Duration	Work Load (Hours)			
ECTS Points an Acti Lectures	nd Work Load vity	Count 14	Duration 3	Work Load (Hours) 42			
ECTS Points an Acti Lectures Self-Study	nd Work Load vity	Count 14 1	Duration 3 70	Work Load (Hours) 42 70			
ECTS Points an Acti Lectures Self-Study Assignments	nd Work Load vity	Count 14 1 2	Duration 3 70 10	Work Load (Hours) 42 70 10			
ECTS Points ar Acti Lectures Self-Study Assignments Presentation / S Preparation	nd Work Load vity Seminar	Count 14 2	Duration 3 70 10	Work Load (Hours) 42 70 10			
ECTS Points an Acti Lectures Self-Study Assignments Presentation / S Preparation Midterm Exam	nd Work Load vity Seminar	Count 14 1 2 1	Duration 3 70 10 2	Work Load (Hours) 42 70 10 2			
ECTS Points an Acti Lectures Self-Study Assignments Presentation / S Preparation Midterm Exam Recitations	nd Work Load vity Seminar	Count 14 1 2 1 1 1 14	Duration 3 70 10 2 2 2 2 2 2 2 2 2 2	Work Load (Hours) 42 70 10 2 28			
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4	Establishing a physical circuit in a laboratory environment with electrical circuit equipment										
Weekly Content											
1	Basic concept method for network calculation for direct current										
2	Basic laws of electrical engineering- Kirchoff's theorem										
3	Methods of analysis of linear electrical circuits										
4	Substitute sources, superposition theorem										
5	Circuit theorems: Thevenin's theorem, Norton's theorem										
6	Operational amplifier										
7	Inductance, capacitance, the coil, the capacito										
8	First order circuits										
9	Midterm Exam										
10	Behavior of RC and RL elements in the time domain, the step response sequential circuit, unrestricted response										
11	Second order circuits										
12	Analysis of transient response of 2nd order circuits, RLC circuits										
13	Sinusoidal alternating quantities, impedance, admittance										
14	Complex calculations Special circuits of alternating current technology										
15	Power in an alternating current circuit										
Contribution o	Contribution of Learning Outcomes to Program Objectives (1-5)										
	P1	P2	P3	P4	P5	P6	P7	P8	P9	P10	P11
1	5	4	4	3	5	3	3	4	5	4	4
2	5	4	4	3	5	3	3	4	5	4	4
3	5	4	4	3	5	3	3	4	5	4	4
4	4	5	4	5	5	3	4	4	5	5	5
Contribution Level 1: Low 2: Low-intermediate 3: Intermediate 4: High 5: Very High											
https://obs.tau.edu.tr/oibs/bologna/progLearnOutcomes.aspx?lang=en&curSunit=196											
Compiled by:	ı piled by: R.A. Oğuzhan Memişoğlu										
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