DEPARTMENT OF MECHATRONICS ENGINEERING
COURSE SYLLABUS

Course Details					
Code			**Academic Year**		**Semester**
MEC214			2		Spring
Title			**T**	**A**	**L**	**ECTS**
Electrical Circuits II			3	1	2	6

Language	German
Level	Undergraduate ✓ Graduate Postgraduate
Department / Program	Mechatronics Engineering
Forms of Teaching and Learning	Formal
Course Type	Compulsory ✓ 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. ◆ Vocational competence: 60% ◆ Methodological competence: 15% ◆ System competence: 15% ◆ Social competence: 10%
Content	• Alternating current (AC) circuits • Sinusoidal steady-state analysis • Three-phase circuits • Magnetically coupled circuits • Frequency response • Laplace transform and its applications in circuit analysis
Prerequisites	MEC213
Coordinator	Asst. Prof. Dr. Merve TEKE BUDAKLI
Lecturer(s)	Asst. Prof. Dr. Merve TEKE BUDAKLI
Assistant(s)	R.A. Oğuzhan MEMİŞOĞLU, R.A. Nurettin ÖZÇELİK
Work Placement	-

Recommended or Required Reading	
Books / Lecture Notes	• Elektrotechnik für Ingenieure 3, W. Weißgerber, Springer, 2015 • Electric Circuits, JW Nilsson, S Riedel, Pearson, 2015 • Fundamentals of Electric Circuits, Charles K. Alexander, Matthew N. O. Sadiku, 2016
Other Sources	

Additional Course Material	
Documents	-

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Assignments	-
Exams	1 Midterm Exam – 1 Final Exam

Course Composition		
Mathematics und Basic Sciences	30	%
Engineering	30	%
Engineering Design		%
Social Sciences		%
Educational Sciences		%
Natural Sciences		%
Health Sciences		%
Expert Knowledge	40	%

Assessment		
Activity	**Count**	**Percentage (%)**
Midterm Exam	1	35
Quiz		
Assignments		
Attendance		
Recitations/ Lab	1	20
Projects		
Final Exam	1	45
Total		**100**

ECTS Points and Work Load			
Activity	**Count**	**Duration**	**Work Load (Hours)**
Lectures	15	3	45
Self-Study	1	70	70
Assignments	2	10	10
Presentation / Seminar Preparation			
Midterm Exam	1	2	2
Recitations	14	2	28
Laboratory	5	2	10
Projects			
Final Exam	1	2	2
Total Workload			**167**
ECTS Points (Total Workload / Hour)			**6**

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Learning Outcomes

1	Circuit analysis in alternating current
2	Application of Laplace and Fourier transforms in electrical circuit analysis
3	Learning passive and active filter circuits
4	Establishing a physical circuit in a laboratory environment with electrical circuit equipment

Weekly Content

1	Sinusoids and phasors
2	Analysis methods in AC circuits
3	Analysis methods in AC circuits
4	AC power analysis
5	Three-phase circuits
6	Unbalanced three-phase circuits
7	Magnetically coupled circuits
8	Magnetically coupled circuits
9	Midterm Exam
10	Frequency response
11	Bode plots and resonance
12	Passive and active filters
13	Laplace transform
14	Inverse Laplace transform
15	Applications of the Laplace transform

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:	R.A. Nurettin ÖZÇELİK
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