

DEPARTMENT OF MECHATRONICS ENGINEERING **COURSE SYLLABUS**

Course Details										
Code	Acade	emic Ye	ar	Semester						
ETE331				3			Fall			
Title	т	Α	L	ECTS						
Electrical Machines I	3	1	1	6						
Language	German									
Level	Undergraduate	x		P	Postgraduate					
Department / Program	Electrical And Electronics Engineering									
Forms of Teaching and Learning	Face to face									
Course Type	Compulsory		x	Ele	ctive					
Objectives	The students learn principles and are	n different typ able to select	es of electrical suitable mach	machines ines for pr	with th actical	neir woi applica	rking and operating tions.			
Content	Physical basics of electromechanical energy conversion; Three-phase systems and rotating fields; structure, working and operating principles of DC motors, transformers, asynchronous machines, synchronous machines and AC motors; Areas of application.									
Prerequisites	-									
Coordinator										
Lecturer(s)										
Assistant(s)										
Work Placement	-									
Recommended or Required R	eading									
 Fischer R.: Elektrische Maschinen, Springer Verlag, Berlin, 2013 Fuest K. und Döring P.: Elektrische Maschienen und Antriebe, Springer Verlag, 2007 Schröder D.: Elektrische Antriebe – Regelung von Antriebssystemen, Springer Berlin, 2015 Babiel G.: Elektrische Antriebe in der Eabrzeugstechnik Vieweg/Teubner, 2009 										
Other Sources										
Additional Course Material										
Documents										
Assignments										
Exams	1 Midterm, 1 Final	exam								
Course Composition										
Mathematics und Basic Sciences		20					%			



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Engineering	40	%				
Engineering Design	20	%				
Social Sciences		%				
Educational Sciences		%				
Natural Sciences		%				
Health Sciences		%				
Expert Knowledge	20	%				
Assessment						
Activity	Count	Percentage (%)				
Midterm Exam	1	40				
Quiz	2	10				
Assignments						
Attendance						
Recitations	14	10				
Projects						
Final Exam	1	40				
	Total	100				

ECTS Points and Work Load

Activity	Count	Duration	Work Load (Hours)
Lectures	14	3	28
Self-Study	14	8	112
Assignments			
Presentation / Seminar Preparation			
Midterm Exam	1	2	2
Recitations	14	1	14
Laboratory	14	1	14
Projects			
Final Exam	1	2	2
		Total Work Load	172
	6		

Learning	Outcomes

1	The students know the working and operating principles of various electrical machines.
2	The students are able to select suitable electrical machines for a given task and dimension them.
3	The students are able to carry out laboratory experiments independently with electrical machines, evaluate them and create laboratory protocols.
4	The students are able to define engineering problems independently and also to develop solutions and implement them.



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5	The students have the ability to work in groups.
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12	
Weekly Conter	ıt
1	Introduction to the physical basics of the electrical machines
2	DC motors (structure, working principles and basic equations)
3	DC motors (separately excited, series wound, shunt wound, compound and permanent magnet motors, operating, speed control)
4	Three-phase systems and rotating field
5	Transformers (AC and three-phase)
6	Transformers (working principles)
7	Asynchronous machine (wound rotor, cage rotor)
8	Asynchronous machine (starting, starting current, starting torque)
9	Midterm exam
10	Asynchronous machine (braking, speed control)
11	Synchronous machine (structure, working principles)
12	Synchronous machine (operating, speed control)
13	AC motors (single-phase motor, capacitor motor, shaded-pole motor)
14	AC motors (polyphase motor)
15	Industrial applications: electromobility, wind turbines, robots

Contribution of Learning Outcomes to Program Objectives (1-5)												
	P1	P2	P3	P4	P5	P6	P7	P8	P9	P10	P11	P12
1	4					2						
2		5		3								
3			5									
4		5										
5					5							
6												
7												



DEPARTMENT OF MECHATRONICS ENGINEERING US

COU	JRSE	SYL	LAB
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8												
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11												
12												
Contribution Level 1: Low 2: Low-intermediate 3: Intermediate 4: High 5: Very High												
Compiled by:												
Date of Comp	ilation		11.06.20	21								