

FUNDAMENTALS OF ELECTRICS AND ELECTRONICS

1	Course Title:	FUNDAMENTALS OF ELECTRICS AND ELECTRONICS
2	Course Code:	MAK2011
3	Type of Course:	Compulsory
4	Level of Course:	First Cycle
5	Year of Study:	2
6	Semester:	3
7	ECTS Credits Allocated:	3.00
8	Theoretical (hour/week):	2.00
9	Practice (hour/week):	0.00
10	Laboratory (hour/week):	0
11	Prerequisites:	None
12	Language:	Turkish
13	Mode of Delivery:	Face to face
14	Course Coordinator:	Yrd.Doç.Dr. GÜRSEL ŞEFKAT
15	Course Lecturers:	Yrd. Doç. Dr. Elif Erzan TOPÇU
16	Contact information of the Course Coordinator:	E-Posta: sefkat@uludag.edu.tr Tel: 0 224 294 19 86 Posta Adresi: U.Ü., Müh.–Mim. Fakültesi, Makine Müh. Bölümü, 16150 Görükle/Bursa
17	Website:	http://www20.uludag.edu.tr/~mtd/MAK2011.htm
18	Objective of the Course:	Mechanical Engineering students, the indispensable elements of modern devices, electrical and electronic components, to introduce the concepts and theories. Electromagnets, AC-DC motor, step motor operating principles such as the electro-mechanical actuators, and control methods to provide information about the elections. Introduce the methods of measurement and measurement elements.
19	Contribution of the Course to Professional Development:	
20	Learning Outcomes:	
	1	Explain the simple electrical and electronic circuits as functional.
	2	Ability to analyze simple electrical circuits.
	3	To understand the direct and alternating current circuits and apply to compensation methods in AC circuits.
	4	To understand the working principles of electromechanical devices and to use such equipment.
	5	To understand the working principles and applications of the drive engines and To understand control methods.
	6	To understand the basic logic of the systems like Microprocessor and PLC, and develop simple application.
	7	Ability to the selection of the measuring system and tools in his studies.
	8	Expected to provide the performance and efficiency of the machine, component, system or process; selection, development, design ability to wins.
	9	Multi-disciplinary team work and leadership ability.
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21	Course Content:	

Course Content:				
Week	Theoretical	Practice		
1	Introduction, course description, the relationship between course objectives and program outcomes and outputs, course of processing and distribution of weeks given by the subject, explanation of course assessment method, given the resources, explanation of the importance of basic electrical and electronic information for mechanical engineering and the concept of Mechatronics			
2	The basic electrical quantities, flux and potential difference, the basic electrical components and resistor element, representation of resistors, resistance to temperature change, simple resistive circuits, emf and potential difference, electric power and energy systems.			
3	Solution methods and a sample application circuit, capacitors, simple capacity circuits, capacitor types, and concepts of the magnetic field, inductance element, Kirchhoff's law for self-induction and the magnetic circuit.			
4	Alternative quantities, RLC circuits. Phasor diagram. And calculation of the compensation circuits.			
5	Diodes as electronic circuit elements			
Activites		Number	Duration (hour)	Total Work Load (hour)
Theoretical	General review and practice	14	2.00	28.00
Practicals/Labs		0	0.00	0.00
Self study	Self study and working principles of DC-AC-step and brushless motor	14	1.00	14.00
Homeworks		2	12.00	24.00
Projects	Characteristics of the electric motor, control methods, electric motor selection based on	0	0.00	0.00
Field Studies		0	0.00	0.00
Midterm exams	Repeating courses and midterm exam	1	10.00	10.00
Others		0	0.00	0.00
Final Exams	Measurement Systems, Sensors and	1	10.00	10.00
Total Work Load				86.00
Total work load/30 ECTS	capacitive and inductive transducer and Application Examples.			2.87
ECTS Credit of the Course				3.00
(velocity, position, level, pressure, etc.).				
13	Microprocessor and Microprocessor Controlled Measuring and Control Schemes			
14	General review and practice.			
22	Textbooks, References and/or Other Materials:	1.Fraser C., Milne J., Integrated Electrical andElektronic Engineering for Mechanical Engineers, McGraw-Hill Comp., 1994 2.Alciatore D.G., and Histan M.B., 'Introduction to Mechatronics and Measurement Systems', McGraw-Hill Comp., 2003 3.Musayev E., Electronic Circuit Componenets, Lecture Notes, Bursa, 1998 4.Ongun S., Fundemenrtal of electric and electronic Elektronik ve Elektroniğin Temelleri, Ders Notları		

23	Assesment	
TERM LEARNING ACTIVITIES	NUMBE R	WEIGHT
Midterm Exam	1	30.00
Quiz	1	10.00
Home work-project	2	10.00
Final Exam	1	50.00
Total	5	100.00
Contribution of Term (Year) Learning Activities to Success Grade		50.00
Contribution of Final Exam to Success Grade		50.00
Total		100.00
Measurement and Evaluation Techniques Used in the Course		

24	ECTS / WORK LOAD TABLE
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25	CONTRIBUTION OF LEARNING OUTCOMES TO PROGRAMME QUALIFICATIONS															
	PQ1	PQ2	PQ3	PQ4	PQ5	PQ6	PQ7	PQ8	PQ9	PQ10	PQ11	PQ12	PQ13	PQ14	PQ15	PQ16
ÖK1	4	2	2	0	0	0	0	0	0	0	0	0	0	0	0	0
ÖK2	4	0	2	2	0	0	0	0	0	0	0	0	0	0	0	0
ÖK3	4	0	1	1	0	0	0	0	0	0	0	0	0	0	0	0
ÖK4	0	0	0	3	0	0	0	0	0	0	0	0	0	0	0	0
ÖK5	2	0	4	3	0	0	0	0	0	0	0	0	0	0	0	0
ÖK6	2	1	3	3	0	0	0	0	0	0	0	0	0	0	0	0
ÖK7	0	2	0	0	4	0	0	0	0	0	0	0	0	0	0	0
ÖK8	3	2	3	0	0	0	0	0	0	0	0	0	0	0	0	0
ÖK9	0	0	0	0	0	0	3	0	0	0	0	0	0	0	0	0
LO: Learning Objectives PQ: Program Qualifications																
Contribution Level:	1 very low		2 low		3 Medium		4 High		5 Very High							