

EM 295 Introduction to Electrical Engineering				DEPARTMENT of MECHANICAL ENGINEERING					
Semester	Methods of Education							Credits	
	Lecture	Recit.	Lab.	Project / Field Study	Homework	Other	Total	Credit	ECTS Credit
3	42	-	-	-	-	58	100	3	4.0
Language	Turkish								
Compulsory / Elective	Compulsory								
Prerequisites	None								
Course Contents	Definitions and units. Basic laws. Circuit analysis methods. Resistive circuits. Inductor and capacitor. Dynamic response. Alternating current circuits. Electrical measurement and instruments. Transformers. Generators. Motors. Semiconductor electronics. Principles of diode, transistors, thyristor and applications.								
Course Objectives	To teach the principles of electrical engineering to the Mechanical Engineering students.								
Learning Outcomes and Competences	Learning the fundamentals of Electrical energy usage and operating principles of various electrical and electronics systems. Acquiring the knowledge that may be necessary in the work environment.								
Textbook and / or Reference	1) Rizzoni, G., Principles and Applications of Electrical Engineering, Mc Graw Hill 2) Aydemir, M.T., Nakiboğlu, C., Elektrik Devreleri, Schaum Books (Translation)								
Assessment Criteria						If any, mark as (x)		Percentage (%)	
	Midterm Exams					X		60	
	Quizzes								
	Homeworks								
	Projects								
	Term Paper								
	Laboratory Work								
	Other								
	Final Exam					X		40	
Instructors	Electrical Engineering Department academic staff								
Week	Subject								
1	Introduction: Basic concepts and units. Static electric; Coulomb and Ampere laws. Potential difference.								
2	DC Circuits: Electric current. Ground concept. Resistors and Ohm’s Law. Power.								
3	DC Circuits: Ideal voltage source. Current source. Serial and parallel connections. Circuit analysis by using loop current and node voltage equations.								
4	DC Circuits: Thevenin equivalent circuit and superposition principle.								
5	AC Circuits: Alternating current concept. Types of alternating current. Frequency, period, amplitude and phase concepts. Average and effective values. Complex numbers and calculations.								
6	Midterm I								
7	AC Circuits: Capacitor and inductor components. Complex impedance. AC circuit analysis. Input impedance and power factor. Phase shifting. Resonance circuits. Average power. Active and reactive power. Power factor. Power meter connections.								
8	Energy Systems: Principles of electric energy generation and transmission. Transformers. Reactive power compensation. Grounding. Relays.								
9	Electric Machinery: Electromechanic energy conversion. DC and AC motors and their control. Robots.								
10	Analog Electronics: Diodes and transistors. Rectifiers.								
11	Midterm II								
12	Analog Electronics: Operational amplifiers. Comparators. Measurement circuits and sensors.								
13	Digital Electronics: Boolean Algebra. Logic circuit components.								
14	Digital Electronics: Logic circuit design and applications.								