Course Description Form	
Course Code and Name	EM 295 INTRODUCTION TO ELECTRICAL ENGINEERING
Course Semester	3
Catalog Content	DC Circuits, AC Circuits, Energy Systems, Analog Electronics, Digital Electronics
Textbook	Rizzoni, G., Principles and Applications of Electrical Engineering, Mc Graw Hill
Supplementary Textbooks	Aydemir, M.T., Nakiboğlu, C., Elektrik Devreleri, (Çeviri), Schaum Serisi
Credit	3
Prerequisites of the Course (Attendance Requirements)	-
Type of the Course	Compulsory
Instruction Language	English
Course Objectives	To learn principles of electrical engineering
Course Learning Outcomes	1. To learn the basic concepts related to the use of electrical energy. 2. To learn the working principles of various electrical and electronic systems. 3. Acquiring a general electrical engineering knowledge that may be required in business life. 4. Explains the structure, working principle, different connection types of direct current motors.
Instruction Methods	Lecture, Question & Answer, Demonstration, Drill - Practise
Weekly Schedule	1. Week :Introduction: Basic concepts and units. Static electric; Coulomb and Ampere laws. Potential difference. 2. Week :DC Circuits: Electric current. Ground concept. Resistors and Ohm's Law. Power. 3. Week :DC Circuits: Ideal voltage source. Current source. Serial and parallel connections. Circuit analysis by using loop current and node voltage equations. 4. Week :DC Circuits: Thevenin equivalent circuit and superposition principle. 5. Week :AC Circuits: Alternating current concept. Types of alternating current. Frequency, period, amplitude and phase concepts. Average and effective values. 6. Week :AC Circuits: Alternating current concept. Types of alternating current. Frequency, period, amplitude and phase concepts. Average and effective values. 7. Week :AC Circuits: Capacitor and inductor components. Complex impedance. AC circuit analysis. Input impedance and power factor. Phase shifting. 8. Week :1. Midterm, Energy Systems: Principles of electric energy generation and transmission. Transformers. Reactive power compensation. Grounding. Relays. 9. Week :Electric Machinery: Electromechanic energy conversion. DC and AC motors and their control. Robots. 10. Week :Analog Electronics: Diodes and transistors. Rectifiers. 11. Week :Analog Electronics: Operational amplifiers. Comparators. Measurement circuits and sensors. 12. Week :Digital Electronics: Boolean Algebra. Logic circuit components.

13. Week :2. Midterm, Digital Electronics: Logic circuit design and applications.
14. Week :Digital Electronics: Logic circuit design and applications.
15. Week: Final

Teaching and Learning Methods

(These are examples. Please fill which activities you use in the course)

Weekly theoretical course hours: 2
Weekly applied course hours: 1
Reading
Preparation of Midterm and Midterm Exam
Final Exam and Preparation for Final Exam

Assessment Criteria

	Numbers	**Total Weighting (%)**
Midterm Exams	2	60
Assignment	0	0
Application	0	0
Projects	0	0
Practice	0	0
Quiz	0	0
Percent of In-term Studies (%)	-	60
Percentage of Final Exam to Total Score (%)	-	40
Attendance	-	0

Workload

Activity	**Total Number of Weeks**	**Duration (weekly hour)**	**Total Period Work Load**
Weekly Theoretical Course Hours	14	2	28
Weekly Tutorial Hours	14	1	14
Reading Tasks	9	1	9
Studies	9	1	9
Material Design and Implementation			0
Report Preparing			0
Preparing a Presentation			0
Presentations			0
Midterm Exam and Preperation for Midterm Exam	2	5	10
Final Exam and Preperation for Final Exam	1	5	5
Other (should be emphasized)			
Total Workload			75
Total Workload / 25			3.0
Course Credit (ECTS)			3

Contribution Level Between Course Learning Outcomes and Program Outcomes

NO	**PROGRAM LEARNING OUTCOMES**	**1**	**2**	**3**	**4**	**5**
1	Adequate knowledge of subjects specific to mathematics, natural sciences and related engineering disciplines; ability to use				x	

		theoretical and applied knowledge related to these areas in complex engineering problems.					
	2	Ability to identify, define, formulate, and solve complex engineering problems; ability to select and apply appropriate analysis and modeling methods to this end.		X			
	3	Ability to design a complex system, process, device or product under realistic constraints and conditions to meet specific requirements; ability to apply modern design methods for this purpose.				X	
	4	Ability to develop, select and use modern techniques and tools required for the analysis and solution of complex problems encountered in engineering practice; ability to use information technologies effectively.			X		
	5	Ability to design and conduct experiments, collect data, analyze and interpret results to investigate complex engineering problems or discipline-specific research topics					
	6	Ability to work effectively in disciplinary and multi-disciplinary teams; ability to work individually.					
	7	Ability to communicate effectively in Turkish, both orally and in writing; knowledge of at least one foreign language; the ability to write effective reports and understand written reports, to prepare design and production reports, to deliver effective presentations, to give and receive clear and understandable instructions.					
	8	Awareness of the necessity of lifelong learning; the ability to access information, to follow developments in science and technology, and to renew oneself constantly.					

	9	Acting in accordance with ethical principles, professional and ethical responsibility; information about standards used in engineering applications.			X		
	10	Information about business life practices such as project management, risk management and change management; awareness of entrepreneurship, innovation; information about sustainable development.					
	11	Knowledge about the universal and social effects of engineering applications on health, environment and safety and the problems of the age reflected in the engineering field; awareness of the legal consequences of engineering solutions.					
The Course's Lecturer(s) and Contact Informations	1. erdal@gazi.edu.tr, Prof. Dr. Erdal IRMAK						