T.C. ESKİŞEHİR OSMANGAZİ UNIVERSITY ENGINEERING AND ARCHITECTURE FACULTY
MECHANICAL ENGINEERING DEPARTMENT
COURSE INFORMATION FORM

SEMESTER OFFERED	FALL

COURSE CODE	151813355	COURSE TITLE	FUNDAMENTALS OF ELECTRIC AND ELECTRONICS

SEMESTER in Program	WEEKLY COURSE HOURS			COURSE			
	Theory	Practice	Laboratory	Credit	ECTS	TYPE	LANGUAGE
3	3	0	0	3	4	REQUIRED	ENGLISH

COURSE ECTS CREDIT DISTRIBUTION

Basic Science	Basic Engineering	Mechanical Engineering	Design	Social Science
	4			

ASSESSMENT CRITERIA

	Evaluation Type	Quantity	%
EXAMS AND ASSIGNMENTS IN SEMESTER	Mid-Term	1	40
	Quiz		
	Homework		
	Project		
	Report		
	Others (……)		
FINAL EXAM		1	60

PREREQUIEITE(S)	None
COURSE DESCRIPTION	Basic concepts, resistive circuits, resistivity, Kirchhoff's current and voltage laws, Electric power and energy, nodal analysis, mesh analysis, Thevenin Equivalent, Maximum Power Transfer, operational amplifiers, first order circuits, second order circuits, frequency domain analysis, active and reactive power, Semiconductors and pn-junctions, Transistors, Solar cells, Electric Motors, and Electrical safety
COURSE OBJECTIVES	1- Providing basic information about electricity, electronic components, power, energy, solar cells and electrical machinery 2- Providing basic information about electrical safety
CONTRIBUTION TO VOCATIONAL EDUATION	Sufficient knowledge of engineering subjects related with mathematics, science and mechanical engineering
COURSE OUTCOMES	1- Ability to analyze resistive and first order electric circuits 2- Ability to analyze ac RLC circuits 3- Understanding of semiconductor switches and solar cells. 4- Basic information about electric motors and electric safety.
TEXTBOOK	Bobrow, L S., "Fundamentals of Electrical Engineering", Rinehart and Winston, Inc. 1985.
OTHER REFERENCES	Any circuit analysis book
TOOLS AND EQUIPMENTS REQUIRED	none

COURSE SYLLABUS	
WEEK	**TOPICS**
1	Importance of electricity and electronics in engineering, Basic concepts, Electric Current
2	Sources, Ohm's Law, resistivity, Kirchhoff's current law, Electric power and energy
3	Nodal analysis
4	Kirchhoff's voltage law, mesh analysis
5	Thevenin and Norton Equivalents, Maximum Power Transfer, operational amplifiers
6	Inductance, Capacitance, first order circuits
7	Second order circuits, frequency domain analysis, impedance, active and reactive power
8	Semiconductors and pn-junctions
9	Diode circuits, Transistors
10	Transistor as a switch
11	Solar cells
12	Electric Motors
13	Electrical safety
14	Review
15,16	Final Exam

NO	**COURSE CONTRIBUTION TO PROGRAM OUTCOMES**	**Contribution Level**		
		3 High	**2 Med**	**1 Low**
1	Sufficient knowledge of engineering subjects related with mathematics, science and mechanical engineering; an ability to apply theoretical and practical knowledge on solving and modeling of mechanical engineering problems.		**x**	
2	Ability to determine, define, formulate and solve complex mechanical engineering problems; for that purpose an ability to select and use convenient analytical and experimental methods.			
3	Ability to design a complex system, a component and/or an engineering process under real life constrains or conditions, defined by environmental, economic and political problems; for that purpose an ability to apply modern design methods.			
4	Ability to develop, select and use modern methods and tools required for mechanical engineering applications; ability to effective use of information technologies.			
5	In order to investigate mechanical engineering problems; ability to set up and conduct experiments and ability to analyze and interpretation of experimental results.		**x**	
6	Ability to work effectively in inner or multi-disciplinary teams; proficiency of interdependence.		**x**	
7	Ability to communicate in written and oral forms in Turkish/English; proficiency at least one foreign language.			
8	Awareness of life-long learning; ability to reach information; follow developments in science and technology and continuous self-improvement.		x	
9	Understanding of professional and ethical issues and taking responsibility			
10	Awareness of project, risk and change management; awareness of entrepreneurship, innovativeness and sustainable development.			
11	Knowledge of actual problems and effects of engineering applications on health, environment and security in global and social scale; an awareness of juridical results of engineering solutions.			

Prepared by: Prof. Dr. H H Erkaya **Date:** **Signature(s):**