



HASAN KALYONCU UNIVERSITY
Faculty of Engineering
Course Description Form

COURSE: Electronics Circuits				
CODE: COME315		SEMESTER : FALL		
LANGUAGE: ENGLISH		TYPE : COMPULSORY		
PRE-REQUISITES: -	THEORY	PRACTICAL	CREDIT	ECTS
CO-REQUISITES: -				
WEEKLY HOURS :	3	2	4	6

CONTENT OF THE COURSE: Dear students, welcome to electronic circuits. This course is covered to provide students with the necessary skills such as diodes, transistors and FET elements, working principles and analysis of electronic circuits and performance criteria of electronic circuits. Evaluation of the course will be done with midterm, homework-laboratory and final exams.

OBJECTIVE OF THE COURSE:

General information about atomic structure, the motion of atomic particles and explanation of their contribution to electrical conduction. To give information about semi conductor technology, operation types, usage types, application areas of semi conductor circuit devices, doing practical applications by giving theoretical information about structures, operation methods and application areas of Differential Amplifiers (DIF-AMP) and Operational Amplifiers (OP-AMP) . To provide the application of information given in circuit design.

WEEKLY SCHEDULE	
Week	Topics
1	Explanation of semiconductors, semiconductor circuit elements and their importance in technology.
2	Additive materials (n-type and p-type materials), structure of diodes, working methods.
3	Diode tests, determination of diode types with measuring instruments. DC and AC analysis of rectifier diode circuits.
4	Current and voltage calculations for ideal, Si and Ge diodes.
5	Rectifiers, cutters, clippers and clampers
6	Diode types (Zener diode, Tunnel diode, LED diode, Photodiode, Schottky diode, ...), structures, operation types and application areas. Regulator circuits and applications
7	Difference Amplifiers (DIF-AMP) structure, operation type, application areas and mathematical examples. Operational Amplifiers (OP-AMP) structure, operation type, application areas.
8	Midterm Exam
9	Applications of Operational Amplifiers (OP-AMP) –Inverting Amplifiers – Non-inverting Amplifiers. Multi Stage Amplifiers. Amplifier design
10	Applications of Operational Amplifiers (OP-AMP) - Summing Amplifiers - Difference Amplifiers. Amplifier designs
11	Applications of Operational Amplifiers (OP-AMP) - Derivator Amplifiers - Integrator Amplifiers
12	Applications of Operational Amplifiers (OP-AMP) - Comparators, Introduction to Active Filters
13	Active Filters, types, calculation methods and applications

TEXTBOOK: Robert L. BOYLESTAD, Lois NASHELSKY (2013), Electronic Devices and Circuit Analysis 11th Ed. (ISBN: 9780132622264), Pearson Pub. USA

REFERENCE BOOKS: -L Jacop MILLMAN, Christos C. HALKIAS (2007), Millman's Electronic Devices and Circuits 2nd Ed. (ISBN: 0070634556), Millman Pub. USA,
-Rudolf GRAF and William SHEETS (2010), Encyclopedia of Electronic Circuits (Volume 7), McGraw-Hill/TAB Electronics, USA,- Robert L. BOYLESTAD, Lois NASHELSKY (2014), Electronic Devices Circuit Theory Lab.Manual 5th Ed. (ISBN: 9780132510424), Pearson Pub. USA

EVALUATION SYSTEM:		
IN-TERM STUDIES	QUANTITY	PERCENTAGE (%)
Midterm Exam	1	30
Quiz	3	15
Laboratory works	13	15
Final Exam	1	40
TOTAL	18	100
CONTRIBUTION OF INTERM STUDIES TO OVERALL GRADE	17	60
CONTRIBUTION OF FINAL EXAMINATION TO OVERALL GRADE	1	40
TOTAL	18	100

COURSE CATEGORY:	PERCENTAGE (%)
Mathematics and Basic Sciences	40
Engineering	40
Engineering Design	20
Social Sciences	

TABLE OF ECTS / WORKLOAD:			
Activities	QUANTITY	Duration (Hour)	Total Workload
Course Duration	13	3	39
Hours for off-the-classroom study (Pre-study, practice)	14	7	98
Laboratory works	13	2	26
Mid-term	1	1,5	1,5
Final examination	1	1,5	1,5
Quiz	3	1	3
Total Work Load			169
Total Work Load / 30			5,63
ECTS Credit of the Course			6

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11
LO1	3	3	0	0	0	0	0	0	0	0	0
LO2	3	3	1	0	0	0	0	0	0	0	0
LO3	3	3	1	0	0	0	0	0	0	0	0
LO4	3	3	1	0	0	0	0	0	0	0	0
LO5	3	3	2	0	0	0	0	0	0	0	0
LO6	3	3	2	0	0	0	0	0	0	0	0
LO7	3	3	3	0	0	0	0	0	0	0	0
	PO: Program Outcomes LO: Learning Outcomes Values: 0: None 1: Low 2: Medium 3: High										

INSTRUCTOR(S):	Asst. Prof. Dr. Abdul HAFEZ
FORM PREPARATION DATE:	22.05.2019

LEARNING OUTCOMES OF THE COURSE:	PROGRAM OUTCOMES:
<p>LO1: Technology of semiconductors. To learn how to get and use n-type and p-type materials</p> <p>LO2: Structure of rectifier diodes, operation and application of them.</p> <p>LO3: Application and analysis of diodes in DC and AC circuits</p> <p>LO4: Analysis of diode types (Zener LED, Tunnel,...) and analysis of their applications</p> <p>LO5: To learn the types of rectifiers and regulation circuits</p> <p>LO6: To learn power amplifier types (DIF-AMP and OP-AMP) and their usage in circuits</p> <p>LO7: To learn purposive circuit design and analysis.</p>	<p>PO1: Adequate knowledge in mathematics, science and engineering subjects pertaining to the relevant discipline; ability to use theoretical and applied knowledge in these areas in complex engineering problems.</p> <p>PO2: Ability to identify, formulate, and solve complex engineering problems; ability to select and apply proper analysis and modeling methods for this purpose.</p> <p>PO3: Ability to design a complex system, process, device or product under realistic constraints and conditions, in such a way as to meet the desired result; ability to apply modern design methods for this purpose.</p> <p>PO4: Ability to devise, select, and use modern techniques and tools needed for analyzing and solving complex problems encountered in engineering practice; ability to employ information technologies effectively.</p> <p>PO5: Ability to design and conduct experiments, gather data, analyze and interpret results for investigating complex engineering problems or discipline specific research questions.</p> <p>PO6: Ability to work efficiently in intra-disciplinary and multi-disciplinary teams; ability to work individually.</p> <p>PO7: Ability to communicate effectively in Turkish, both orally and in writing; knowledge of a minimum of one foreign language; ability to write effective reports and comprehend written reports, prepare design and production reports, make effective presentations, and give and receive clear and intelligible instructions.</p> <p>PO8: Recognition of the need for lifelong learning; ability to access information, to follow developments in science and technology, and to continue to educate him/herself.</p> <p>PO9: Consciousness to behave according to ethical</p>

	<p>principles and professional and ethical responsibility; knowledge on standards used in engineering practice.</p> <p>PO10: Knowledge about business life practices such as project management, risk management, and change management; awareness in entrepreneurship, innovation; knowledge about sustainable development.</p> <p>PO11: Knowledge about the global and social effects of engineering practices on health, environment, and safety, and contemporary issues of the century reflected into the field of engineering; awareness of the legal consequences of engineering solutions.</p>
--	--