

## ELEC3301 COURSE CATALOG INFO

Course Code : ELEC3301				Course Name : Electronics I			
Semester	Lecture (Le+T+L)	Local Credit	ECTS	Language	Category	Instructional Methods	Prerequisites
5	(4+1+0)	4	6	English	Core	Lecture	ELEC2201 OR ELEC2205
<b>Course Content</b>	Semiconductor materials and diodes. Diode circuits. The Bipolar Junction Transistor (BJT). Dc analysis of the BJT. Basic BJT amplifiers and ac analysis. The common emitter BJT amplifier. The common collector (emitter-follower) BJT amplifier. Multistage BJT amplifiers. The Field-Effect Transistor (FET). Metal Oxide Semiconductor Field-Effect Transistor (MOSFET) and its dc analysis. Junction Field-Effect Transistor (JFET) and its dc analysis. Basic FET amplifiers. The MOSFET amplifiers and ac analysis. The common-source MOSFET amplifier. The common-drain (source-follower) MOSFET amplifier. Multistage MOSFET amplifiers. Basic JFET amplifier and ac analysis.						
<b>Course Outcomes</b>	<p><b>CO 1.</b> Identify the basic properties of the semiconductor materials, the pn junction, dc models and ac equivalent circuits of the diode circuits.</p> <p><b>CO 2.</b> Analyze and design the diode circuits such as rectifier circuits, zener diode circuits, and clipper and clamper circuits.</p> <p><b>CO 3.</b> Analyze and apply the principles of bipolar junction transistor (BJT) operation in dc condition.</p> <p><b>CO 4.</b> Analyze the BJT amplifiers in ac condition and design the BJT amplifiers.</p> <p><b>CO 5.</b> Analyze and apply the principles of field effect transistor (FET) operation in dc condition.</p> <p><b>CO 6.</b> Analyze the FET amplifiers in ac condition and design FET amplifiers.</p>						

COURSE PLAN	
W1	Semiconductor Materials and Diodes
W2	Semiconductor Materials and Diodes
W3	Semiconductor Materials and Diodes
W4	Diode Circuits
W5	Diode Circuit Applications
W6	Physics and dc Operation of the Bipolar Junction Transistor (BJT)
W7	Physics and dc Operation of the Bipolar Junction Transistor (BJT)
W8	Basic BJT Amplifiers
W9	Basic BJT Amplifiers

W10	Physics and dc Operation of the Metal Oxide Semiconductor Field Effect Transistor (MOSFET)
W11	Physics and dc Operation of the Junction Field Effect Transistor (JFET)
W12	Basic MOSFET Amplifiers
W13	Basic MOSFET Amplifiers
W14	Basic JFET Amplifiers

<b>COURSE ASSESMENT AND ECTS WORK LOAD</b>			
<b>Type of Work</b>	<b>Count</b>	<b>ECTS WORK LOAD</b>	
		<b>Time (Hour)(Including prep. time)</b>	<b>Work Load</b>
Attendance	14	4	56
Final Exam	1	20	20
Quizzes			0
Term project			0
Reports			0
Final Project			0
Seminar			0
Assignments			0
Presentation			0
Midterms		20	20
Project			0
Laboratory		0	0
Tutorial	14	1	14
Other(Self study, Paper reviews)		40	40
		<b>Total work load</b>	<b>150</b>

	<b>Total work load/25</b>	6
	<b>ECTS Credit</b>	6

<b>PO</b>	<b>Program Outcomes</b>	<b>CO</b>
1	1.1. Adequate knowledge in fundamentals of mathematics (algebra, differential equations, integrals, probability etc), science (physics, chemistry, biology etc.) and computer science (programming and simulation);	1
	1.2. ability to use theoretical and applied knowledge in these areas in complex engineering problems.	1
2	2.1. Ability to identify, formulate, and solve complex engineering problems;	2,...,6
	2.2. ability to select and apply proper analysis and modeling methods for this purpose.	
3	3.1. Ability to design and integrate components of a complex system or process, as they relate to Electrical and Electronics Engineering discipline, under realistic constraints and conditions, in such a way as to meet desired requirements;	2,4,6
	3.2. ability to apply modern design methods.	
4	4.1. Ability to devise, select, and use techniques and tools needed for analyzing and solving complex problems encountered in engineering practice;	
	4.2. ability to employ information technologies effectively.	
5	5.1. Ability to design experiments,	
	5.2. ability to conduct experiments, gather, analyze and interpret data.	
6	6.1. Ability to work in intra-disciplinary teams;	
	6.2. ability to work in multi-disciplinary teams;	
	6.3. ability to take individual responsibilities.	
7	7.1. Ability to effectively communicate via written and oral means;	
	7.2. knowledge of at least one foreign language;	
	7.3. ability to write effective reports and comprehend written reports;	
	7.4. ability to write design and manufacturing reports	
	7.5. ability to present effectively,	

	7.6. ability to give and follow clear instructions.	
8	8.1. Recognition of the need for lifelong learning;	
	8.2. ability to access information, to follow developments in science and technology, and to continue to educate him/herself.	
9	9.1. Consciousness to behave according to ethical principles, and about professional and ethical responsibility;	
	9.2. knowledge on standards used in engineering practice.	
10	10.1. Knowledge about business life practices such as project management, risk management, and change management;	
	10.2. awareness in entrepreneurship, innovation;	
	10.3. knowledge about sustainable development.	
11	11.1. 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;	
	11.2. awareness of the legal consequences of engineering solutions.	

Revision Date	Prepared by	Approved by
1.9.2019	Prof.Dr. Ümit Güz	Prof.Dr. Ahmet Aksen
1.6.2021		