ELEC3302 COURSE CATALOG INFO

Course Code : ELEC3302				**Course Name :** Electronics II			
Semester	**Lecture (Le+T+L)**	**Local Credit**	**ECTS**	**Language**	**Category**	**Instructional Methods**	**Prerequisites**
6	(4+1+0)	4	6	English	Core	Lecture	ELEC3301 OR ELEC3305
Course Content	Amplifier frequency response. Transistor amplifiers with circuit capacitors. Frequency response of BJT. Frequency response of FET. High frequency response of the transistor circuits. Output stages and power amplifiers. Classes of the amplifiers. Class-A power amplifiers. Class-AB push-pull output stages. Ideal operational amplifiers and op-amp circuits. Differential and multistage amplifiers. Feedback and stability: Voltage (series-shunt), current (shunt-series), transconductance (series-series), and transresistance (shunt-shunt) amplifiers. Loop gain. Stability of feedback circuits. Oscillators.						
Course Outcomes	**CO 1.** Analyze the frequency response of the bipolar junction transistor (BJT) and field effect transistor (FET) amplifiers. **CO 2.** Analyze and design the class A, B and AB push-pull power output stages. **CO 3.** Analyze and design the differential amplifier stages. **CO 4.** Identify the OPAMP parameters and utilize them in the analysis and design of OPAMP applications. **CO 5.** Identify the basic feedback types and stability concept in different feedback amplifiers. **CO 6.** Derive the principles of oscillators and design sinusoidal oscillator circuits.						

COURSE PLAN	
W1	Low-frequency response of BJT and FET amplifiers
W2	High-frequency response of BJT and FET amplifiers
W3	Power amplifiers: Power transistors, thermal parameters
W4	Types of power amplifiers, Class A, B and AB output stages
W5	Differential Amplifiers: Common mode and differential mode operation
W6	Analysis of BJT and FET differential stages
W7	Feedback and stability: Voltage, current, transimpedance and transconductance type amplifiers.
W8	Analysis of BJT, FET and OPAMP feedback amplifiers
W9	OP AMP circuits

W10	Non-ideal parameters of OPAMPs: Finite internal resistances and open loop gain, frequency response, slew-rate, offset and drift
W11	Stability in feedback circuits, Barkhausen oscillation criteria
W12	Operation principles of sinusoidal phase shift oscillators
W13	BJT, FET, OPAMP oscillators, Wien Bridge, Hartley and Collpitts oscillators, crystals
W14	BJT, FET, OPAMP oscillators, Wien Bridge, Hartley and Collpitts oscillators, crystals

COURSE ASSESMENT AND ECTS WORK LOAD

Type of Work	Count	ECTS WORK LOAD	
		Time (Hour)(Including prep. time)	**Work Load**
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
		Total work load	150

	Total work load/25	6
	ECTS Credit	6

COURSE ASSESMENT AND ECTS WORK LOAD		
PO	**Program Outcomes**	**CO**
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);	
	1.2. ability to use theoretical and applied knowledge in these areas in complex engineering problems.	1,5
2	**2.1.** Ability to identify, formulate, and solve complex engineering problems;	1,..,6
	2.2. ability to select and apply proper analysis and modeling methods for this purpose.	1,..,6
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;	2,3,4
	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.	

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