EEE301 ELECTRONICS I

Course Code	Course Name		Semester
EEE301	ELECTRONICS I		Fall ☒ Spring ☐ Summer ☐
Hours			**Credit** / **ECTS**
Theory	**Practice**	**Lab**	4 / 5
3	0	2	

Course Details	
Department	ELECTRICAL ELECTRONICS ENGINEERING
Course Language	English
Course Level	Undergraduate ☒ Graduate ☐
Mode of Delivery	Face to Face ☒ Online ☐ Hybrid ☐
Course Type	Compulsory ☒ Elective ☐
Lecturer(s)	Dr. Hüseyin KÖSE
Course Objectives	- To become familiar with electronic devices and semiconductor theory, - To establish a robust electronic basics, - This course will be rudimentary for the future educational and professional lives of the engineers, - Being introduced to and comprehending electronic device behaviors, the structure of electronic circuits, and their analyzing techniques to students. - To provide students with laboratory studies for practicing the theoretical information and getting familiar with reporting.
Course Content	Structure of atom, insulator, semiconductor materials, P and N-type materials, diodes, diode applications, Zener diode, basic voltage regulator circuits. BJT transistors, structures, properties, BJT biasing, and small signal analysis of BJTs. FET types (FET, JFET, MOSFET), structures, properties, biasing FETs, small signal analysis of FETs, gain, input and output impedances. BJT and FET equivalent circuit models. BJT and FET amplifier circuits.
Course Method/ Techniques	Lecture ☒ Question & Answer ☒ Presentation ☒ Discussion ☒
Prerequisites/ Corequisites	

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Work Placement(s)	Classroom, Laboratory

Textbook/References/Materials

- 1. Boylestad, Nashelsky; Electronic Devices and Circuit Theory (Main Source) –
- 2. Millman, Halkias; Electronic Devices and Circuits
- 3. Lecturer presentations and notes

Course Category

Mathematics and Basic Sciences	☒		Education	☐
Engineering	☒		Science	☐
Engineering Design	☒		Health	☐
Social Sciences	☐		Profession	☐

Weekly Schedule

No	Topics	Materials/Notes
1	Semiconductors and PN junction materials.	Lecturer notes, presentations
2	Diodes and working principles.	Lecturer notes, presentations
3	Diode types, sensors, optocouplers, climp-clamp cicuits, voltage doublers etc.	Lecturer notes, presentations
4	Rectifier cicuits using diodes	Lecturer notes, presentations
5	Zener Diodes and example circuits	Lecturer notes, presentations
6	Zener regulator circuits and applications	Lecturer notes, presentations
7	Example questions and solutions	Lecturer notes, presentations
8	Midterm Exam	
9	Transistors, Working principles of transistors	Lecturer notes, presentations
10	BJT and FET applications, operation characteristics	Lecturer notes, presentations
11	DC Biasing cicuits of BJT and FET	Lecturer notes, presentations
12	AC Biasing cicuits of BJT and FET	Lecturer notes, presentations
13	DC and AC analysis of BJT and FET Amplifier Circuits	Lecturer notes, presentations
14	DC and AC analysis of BJT and FET Amplifier Circuits	Lecturer notes, presentations
15	Example questions and solutions	Lecturer notes, presentations
16	Final Exam	

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Assessment Methods and Criteria

In-term studies	Quantity	Percentage
Attendance		
Lab	14	20
Practice		
Fieldwork		
Course-specific internship		
Quiz/Studio/Criticize		
Homework		
Presentation / Seminar		
Project		
Report		
Seminar		
Midterm Exam	1	20
Final Exam	1	60
Total		**100%**
Contribution of Midterm Studies to Success Grade		
Contribution of End of Semester Studies to Success Grade		
Total		**100%**

ECTS Allocated Based on Student Workload

Activities	Quantity	Duration (Hrs)	Total Workload
Course Hours	14	3	42
Lab	14	2	28
Practice			
Fieldwork			
Course-specific Work Placement			
Out-of-class study time			
Quiz/Studio/Criticize			
Homework			
Presentation / Seminar			
Project			
Report			
Midterm Exam and Preparation for Midterm	1	30	30
Final Exam and Preparation for Final Exam	1	30	30
Total Workload			**130**
Total Workload / 25			**130/25**
ECTS Credit			**5.02**

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Course Learning Outcomes	
No	**Outcome**
L1	To learn diode types and their characteristics and analyze their circuits like climp, clamp, rectifier, doubler, optocoupler etc..
L2	To understand zener regulator theory and application circuits.
L3	To learn BJT's basic characteristics and gain an ability to DC analyze BJT & FET circuits.
L4	To gain the ability to AC analyze BJT & FET amplifiers.
L5	To apply theoretical information to experiments.

Contribution of Course Learning Outcomes to Program Competencies/Outcomes

Contribution Level: 1: Very Slight, 2: Slight, 3: Moderate, 4: Significant, 5: Very Significant

	P1	P2	P3	P4	P5	P6	P7	P8	P9	P10	P11					Total
L1	3	4	4	4	4	3										22
L2	3	4	4	4	4	3										22
L3	3	4	4	4	4	3										22
L4	3	4	4	4	4	3										22
L5	3	4	4	4	4	3										22
															Total	110

i. Sufficient knowledge in the fields of mathematics, natural sciences, and related engineering disciplines; the ability to apply theoretical and practical knowledge in solving complex engineering problems.

ii. The ability to identify, formulate, and solve complex engineering problems; the ability to select and apply appropriate analysis and modeling methods for this purpose.

iii. The ability to design a complex system, process, device, or product to meet specific requirements under realistic constraints and conditions; the ability to apply modern design methods for this purpose.

iv. The ability to select and use modern techniques and tools required for the analysis and solution of complex problems encountered in engineering applications; the ability to effectively use information technologies.

v. The ability to design experiments, conduct experiments, collect data, analyze results, and interpret findings for the investigation of complex engineering problems or discipline-specific research topics.

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vi. The ability to work effectively in intra-disciplinary and multidisciplinary teams; the ability to work independently.

vii. The ability to communicate effectively both orally and in writing; proficiency in at least one foreign language; the ability to write effective reports, understand written reports, prepare design and production reports, make effective presentations, and give and receive clear and understandable instructions.

viii. Awareness of the necessity of lifelong learning; the ability to access information, track developments in science and technology, and continuously renew oneself.

ix. Acting in accordance with ethical principles, knowledge of professional and ethical responsibilities, and the standards used in engineering applications.

x. Knowledge of business practices such as project management, risk management, and change management; awareness of entrepreneurship and innovation; knowledge of sustainable development.

xi. Knowledge of the impact of engineering practices on health, environment, and safety at global and societal levels, and awareness of contemporary engineering issues; awareness of the legal consequences of engineering solutions.

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