EEE302 Electronics II

Course Code	Course Name	Semester	
EEE302	Electronics II	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	Basic understanding of digital integrated circuit design with emphasis on analog circuits and microelectronics. Major topics include biasing, multi-stage amplifiers, frequency response, and feedback.
Course Content	Multistage amplifiers; coupling techniques and frequency response; differential amplifiers; high-frequency modeling of transistors, feedback and broad banding techniques. Analog Integrated Circuits; Operational Amplifiers; power amplifiers; filters and oscillators; regulated power supplies.
Course Method/ Techniques	Lecture ☒ Question & Answer ☒ Presentation ☒ Discussion ☒
Prerequisites/ Corequisites	Electrical Circuits1, Electronics1

Work Placement(s)	In Classroom, In Laboratory

Textbook/References/Materials

1. Lecture Notes and Presentations
2. A. S. Sedra & K. C. Smith, Microelectronic Circuits, 6 th Ed., Oxford University Press, 2011

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

Weekly Schedule

No	Topics	Materials/Notes
1	Building Blocks of IC Amplifiers	Lecturer presentations, notes
2	Differential and Multistage Amplifiers	Lecturer presentations, notes
3	Frequency Response of BJT Circuits	Lecturer presentations, notes
4	Frequency Response of MOSFET circuits	Lecturer presentations, notes
5	Feedback Mechanism	Lecturer presentations, notes
6	Output Stages and Power Amplifiers	Lecturer presentations, notes
7	Output Stages and Power Amplifiers	Lecturer presentations, notes
8	Midterm Exam	
9	Operational-Amplifier Circuits	Lecturer presentations, notes
10	Operational-Amplifier Circuits	Lecturer presentations, notes
11	CMOS Digital Logic Circuits	Lecturer presentations, notes
12	CMOS Digital Logic Circuits	Lecturer presentations, notes
13	Advanced MOS and Bipolar Logic Circuits	Lecturer presentations, notes
14	Advanced MOS and Bipolar Logic Circuits	Lecturer presentations, notes
15	Memory Circuits	Lecturer presentations, notes
16	Final Exam	

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**

Course Learning Outcomes	
No	**Outcome**
L1	Understanding behavior of the semiconductor components.
L2	Application of electrical circuit analysis knowledge.
L3	Application of frequency analysis of electrical circuits.
L4	Understanding the principles of amplifiers and power supplies.
L5	Familiarization with basic practical electronic circuits.

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	4	3	5		4	4										20-
L2	4	3	5		4	4										20-
L3	4	3	5		4	4										20-
L4	4	3	5		4	4										20-
L5	4	3	5		4	4										20-
															Total	100-

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.

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.