EEE202-Electric Circuits II

Course Code	Course Name	Semester	
EEE202	Electric Circuits II	Fall ☒ Spring ☐ Summer ☐	
Hours		**Credit**	**ECTS**
Theory	**Practice** / **Lab**	4	5
4	0 / 0		

Course Details	
Department	Electrical and Electronics Engineering
Course Language	English
Course Level	Undergraduate ☒ Graduate ☐
Mode of Delivery	Face to Face ☒ Online ☐ Hybrid ☐
Course Type	Compulsory ☒ Elective ☐
Lecturer(s)	Prof. Dr. İsmail Avcıbaş
Course Objectives	The basic objective of this course is to introduce students to the fundamental theory and mathematics for the analysis of Alternating Current (AC) electrical circuits, frequency response and transfer function of circuits.
Course Content	Course content include sinusoids and phasors, sinusoidal steady-state analysis, AC power analysis, three-phase circuits, magnetically coupled circuits, the laplace transform and circuit analysis in the s-domain, frequency selective filters.
Course Method/ Techniques	Lecture ☒ Question & Answer ☒ Presentation ☐ Discussion ☒
Prerequisites/ Corequisites	None

Work Placement(s)	

Textbook/References/Materials

- W. Nilsson, S. A. Riedel, Electric Circuits (10th ed.), Pearson.
- Charles K Alexander, Matthew Sadiku, Fundamentals of Electric Circuits (6th Ed.), McGraw Hill.

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

Weekly Schedule

No	Topics	Materials/Notes
1	Sinusoids and Phasors	Nilsson 10th Ed. Chapter 9
2	Sinusoids and Phasors	Nilsson 10th Ed. Chapter 9
3	Sinusoidal Steady-State Analysis	Nilsson 10th Ed. Chapter 9
4	Sinusoidal Steady-State Analysis	Nilsson 10th Ed. Chapter 9
5	AC Power Analysis	Nilsson 10th Ed. Chapter 10
6	AC Power Analysis	Nisson 10th Ed. Chapter 10
7	Three-Phase Circuits	Nilsson 10th Ed. Chapter 11
8	Midterm Exam	
9	Three-Phase Circuits	Nilsson 10th Ed. Chapter 11
10	Magnetically Coupled Circuits	Nilsson 10th Ed. Appendix C
11	The Laplace Transform and Circuit Analysis in the s-Domain	Nilsson 10th Ed. Chapter 12
12	The Laplace Transform and Circuit Analysis in the s-Domain	Nilsson 10th Ed. Chapter 13
13	Frequency Selective Filters	Nilsson 10th Ed. Chapter 14
14	Frequency Selective Filters	Nilsson 10th Ed. Chapter 14
15	3-port Networks	Nilsson 10th Ed. Chapter 18
16	Final Exam	

Assessment Methods and Criteria		
In-term studies	**Quantity**	**Percentage**
Attendance	14	5
Lab		
Practice		
Fieldwork		
Course-specific internship		
Quiz/Studio/Criticize		
Homework	3	15
Presentation / Seminar		
Project	1	10
Report		
Seminar		
Midterm Exam	1	30
Final Exam	1	40
	Total	**100%**
Contribution of Midterm Studies to Success Grade		60%
Contribution of End of Semester Studies to Success Grade		40%
	Total	**100%**

ECTS Allocated Based on Student Workload			
Activities	**Quantity**	**Duration (Hrs)**	**Total Workload**
Course Hours	16	4	64
Lab			
Practice			
Fieldwork			
Course-specific Work Placement			
Out-of-class study time			
Quiz/Studio/Criticize			
Homework	3	5	15
Presentation / Seminar			
Project	1	10	10
Report			
Midterm Exam and Preparation for Midterm	1	15	15
Final Exam and Preparation for Final Exam	1	15	15
Total Workload			**119**
Total Workload / 25			**4.76**
ECTS Credit			**5**

Course Learning Outcomes	
No	**Outcome**
L1	To understand the fundamental principles in electric circuit theory and be able to extend these principles into a way of thinking for problem solving in mathematics, science and engineering
L2	To analyze analog circuits that includes energy storage elements in the time and frequency domains
L3	To apply solving methods and theorems for ac circuits
L4	To solve three phase circuits
L5	To solve circuits in s-domain

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	5	5	4	4	4						3					
L2	5	5	4	4	3						3					
L3	5	5	4	4	3						3					
L4	5	5	4	4	3						3					
L5	5	5	4	4	5						3					
															Total	

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.