EEE 309 Signals and Systems

Course Code	Course Name	Semester	
EEE 309	Signals and Systems	Fall ☒ Spring ☐ Summer ☐	
Hours		**Credit**	**ECTS**
Theory	**Practice** / **Lab**	3	6
3	-- / --		

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)	Assoc. Prof. Dr. Ahmet Güngör Pakfiliz
Course Objectives	- Upon completion of this course, students will understand signal and system models, - Students can use time-domain and Fourier transform techniques to facilitate the analysis of continuous-time and discrete-time signals and systems in time and frequency domains, - Students can explain the relationship between continuous-time and sampled discrete-time signals in the time and frequency domains (signal analysis).
Course Content	- Signals and Systems (General introduction, basic concepts) - LTI systems - Continuous Time Fourier Series - Continuous Time Fourier Transform - Discrete-Time Fourier Series - Discrete-Time Fourier Transform
Course Method/ Techniques	Lecture ☒ Question & Answer ☒ Presentation ☒ Discussion ☒
Prerequisites/ Corequisites	---

Work Placement(s)	

Textbook/References/Materials

- S.Haykin, B. Van Veen, Signals and Systems, 2nd edition, John Wiley & Sons,
- A.V.Oppenhim, A.S.Willsky, I.T.Young; Signals and Systems; 1st edition; Prentice Hall I.E.,
- Z.Z.Karu; Signals and Systems Made Ridiculously Simple,
- H.P.Hsu; Signals and Systems; Schaum's Outline Series, 2nd edition.

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

Weekly Schedule

No	Topics	Materials/Notes
1	General Introduction, Basic Mathematical Concepts	
2	Continuous Time Signals	
3	Discrete-Time Signals	
4	System Properties	
5	Continuous Time LTI Systems	
6	Discrete-Time LTI Systems	
7	Continuous Time Fourier Series	
8	Midterm Exam	
9	Continuous Time Fourier Series	
10	Continuous Time Fourier Transform	
11	Continuous Time Fourier Transform	
12	Discrete-Time Fourier Series	
13	Discrete-Time Fourier Series	
14	Discrete-Time Fourier Transform	
15	Discrete-Time Fourier Transform	
16	Final Exam	

Assessment Methods and Criteria		
In-term studies	**Quantity**	**Percentage**
Attendance	--	--
Lab	--	--
Practice	--	--
Fieldwork	--	--
Course-specific internship	--	--
Quiz/Studio/Criticize	2	15%
Homework	2	15%
Presentation / Seminar	--	--
Project	--	--
Report	--	--
Seminar	--	--
Midterm Exam	1	20%
Final Exam	1	50%
	Total	**100%**
Contribution of Midterm Studies to Success Grade		50%
Contribution of End of Semester Studies to Success Grade		50%
	Total	**100%**

ECTS Allocated Based on Student Workload			
Activities	**Quantity**	**Duration (Hrs)**	**Total Workload**
Course Hours	14	3	42
Lab	0	0	0
Practice	0	0	0
Fieldwork	0	0	0
Course-specific Work Placement	0	0	0
Out-of-class study time	14	2	28
Quiz/Studio/Criticize	2	5	10
Homework	2	6	12
Presentation / Seminar	0	0	0
Project	0	0	0
Report	0	0	0
Midterm Exam and Preparation for Midterm	1	15	15
Final Exam and Preparation for Final Exam	1	23	23
Total Workload			**130**
Total Workload / 25			**130/25**
ECTS Credit			**6**

Course Learning Outcomes	
No	**Outcome**
L1	Students can model linear systems and learn how to use signal types.
L2	Students can learn and use continuous and discrete Fourier series.
L3	They can learn and use continuous and discrete Fourier transforms.
L4	Students gain the ability to work in teams in interdisciplinary areas.
L5	They gain the ability to solve problems related to signals and systems.
L6	Students can use software packages related to signals and systems.

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	4														-
L2	4	4	4													-
L3	4	4	4													-
L4						3										-
L5			3	3												
L6					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.