OSTİM TECHNICAL UNIVERSITY
INSTITUTE OF SCIENCES
ELECTRICAL AND ELECTRONICS ENGINEERING

COURSE SCHEDULE FORM
2023-2024 FALL/SPRING

EEE 310 Control Systems

Course Unit Name	Course Unit Code	Semester	Lecture Hr	Practice Hr	Lab Hr	Credit	ECTS
Control Systems	EEE 310	Spring	4	2	2	4	5

Course Details	
Language of Instruction	English
Level of Course Unit	Bachelor's Degree
Program	
Mode of Delivery	Face to Face
Type of Course Unit	Compulsory
Objectives of the Course	Course aims that student will be able to design control systems based on requirements
Course Content	1. Model systems using differential equations 2. Simulate systems using Simulink 3. Design and tune PID controller using Simulink 4. Transfer Functions, Root-Locus, Bode Plots 4. Implement Digital Controller
Course Method and Techniques	MATLAB/SIMULINK, Microcontrollers
Prerequisites and Corequisities	
Course Coordinator	Assit. Prof. Dr. Şenol GÜLGÖNÜL
Name of Lecturer(s)	Assist. Prof. Dr. Şenol GÜLGÖNÜL
Assistants	
Work Placement(s)	

Recommended or Required Reading
1. Modern Control Systems 13th Edition by Richard Dorf, Robert Bishop 2. University of Michigan Control Tutorials

Course Category

Mathematics and Basic Sciences	:	Education	:
Engineering	: X	Science	:
Engineering Design	:	Health	:
Social Sciences	:	Profession	:

Weekly Detailed Course Contents		
Week No	**Topics**	**Pre-study & Materials**
1	Open-Loop and Closed Loop Systems	Chapter-1
2	Mathematical Model of First Order Systems	Chapter-2
3	Mathematical Model of Second Order Systems	Chapter-2
4	ON-OFF Controller	
5	PID Control of First Order Systems	Chapter-7
6	PID Control of Second Order Systems	Chapter-7
7	PID Tuning Methods	Chapter-7
8	PID Implementation	Chapter-7
9	MIDTERM	
10	Transfer Functions	Chapter-2
11	Root-Locus	Chapter-7
12	Bode Plots	Chapter-8
13	Digital Control	Chapter-13
14		
15		
16		

Course Learning Outcomes	
No	**Learning Outcomes**
C1	Mathematical Modeling of Systems
C2	ON-OFF Controller
C3	PID Controller
C4	Transfer Functions
C5	Root-Locus
C6	Bode Plots
C7	Digital Control Systems
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Programme Outcomes	
No	**Outcomes**
P01	Reaches the knowledge broadly and in depth by doing scientific research in the field, evaluates, interprets and applies the knowledge.
P02	Has comprehensive knowledge about current techniques and methods applied in engineering and their constraints.
P03	Complements and applies knowledge with scientific methods, using uncertain, limited or incomplete data; can use information from different disciplines together.

P04	He is aware of the new and developing applications of his profession, examines and learns them when needed.
P05	Defines and formulates problems related to the field, develops methods to solve and applies innovative methods in solutions.
P06	Develops new and/or original ideas and methods; designs complex systems or processes and develops innovative/alternative solutions in their designs.
P07	Designs and implements theoretical, experimental and modeling research; examines and solves complex problems encountered in this process.
P08	Can work effectively in disciplinary and multi-disciplinary teams, lead such teams and develop solutions in complex situations; can work independently and take responsibility.
P09	Communicates verbally and in writing by using a foreign language at least at the B2 General Level of the European Language Portfolio.
P10	He/she conveys results of his/her studies systematically and clearly in written or verbal form in national and international environments in that field or outside the field.
P11	Knows the social, environmental, health, safety, legal aspects of engineering applications, project management and business life applications and is aware of the constraints they impose on engineering applications.
P12	Observes social, scientific and ethical values in the stages of data collection, interpretation, announcement and in all professional activities.

Assessment Methods and Criteria		
In-term studies	**Quantity**	**Percentage**
Attendance		
Lab	1	20
Practice		
Fieldwork		
Course-specific internship (if any)		
Quiz/Studio/Criticize		
Homework		
Presentation		
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 (Hr)**	**Total Work Load**
Weekly Theoretical Course Hrs (Including the exam week: 16 x total course hours)	16	3	48
Lab			
Practice			
Course-specific internship (if any)			
Fieldwork			
Out-of-class study time	16	5	80
Presentation/Seminar Preperation			

Project	1	50	50
Report			
Homework			
Quiz/Studio/Criticize			
Midterm Exam and Preperation for Midterm	1	24	24
Final Exam and Preperation for Final Exam	1	24	24
Total Workload			**226**
ECTS Credit	**(……. /30) =**		**..**

Contribution of Course Learning Outcomes to Programme Outcomes												
Contribution: 1: Very Slight 2:Slight 3:Moderate 4:Significant 5:Very Significant												
	P01	**P02**	**P03**	**P04**	**P05**	**P06**	**P07**	**P08**	**P09**	**P10**	**P11**	**P12**
C1	5	5	5	5	5	5	5	5	4	4	4	4
C2	5	5	5	5	5	5	5	5	4	4	4	4
C3	5	5	5	5	5	5	5	5	4	4	4	4
C4	5	5	5	5	5	5	5	5	4	4	4	4
C5	5	5	5	5	5	5	5	5	4	4	4	4
C6	5	5	5	5	5	5	5	5	4	4	4	4
C7	5	5	5	5	5	5	5	5	4	4	4	4
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