İzmir Institute of Technology

Faculty of Engineering
Mechanical Engineering BS

ME469	Control System Design				
Semester	**Course Unit Code**	**Course Unit Title**	**L+P**	**Credit**	**Number of ECTS Credits**
7	ME469	Control System Design	3	3	5

Mode of Delivery:
Face to Face
Language of Instruction:
English
Level of Course Unit:
First Cycle
Work Placement(s):
No
Department / Program:
Mechanical Engineering BS
Type of Course Unit:
Required
Objectives of the Course:
The aim of this course is to teach the students the basic design methods of feedback control systems using root locus and frequency response techniques.
Teaching Methods and Techniques:
Root Locus: - Basic Definition and Properties - Design in Feedback Control Systems Using Root Locus Technique Frequency Response: - Basic Definition, Properties - Bode Diagram - Nyquist Diagram and Nichols chart - Stability in Frequency domain - Design in Feedback Control Systems Using Frequency Response Technique
Prerequisites and co-requisities:

Course Coordinator:

Name of Lecturers:
Asist Prof.Dr. Mehmet İsmet Can Dede
Assistants:

Recommended or Required Reading

Resources Ogata K., 'Modern Control Engineering', Prentice Hall, 4. Ed, New Jersey, 2002,Dorf, R.C. and Bishop, R.H., Modern Control Systems, 12th Edition, Pear

Weekly Detailed Course Contents

Week	Topics	Study Materials	Materials
1	Root Locus:- Basic Definition and Properties		Ogata K., 'Modern Control Engineering',
2	Root Locus:- Basic Definition and Properties		Ogata K., 'Modern Control Engineering',
3	Designing Control Systems Using Root Locus Technique		Ogata K., 'Modern Control Engineering',
4	Designing Control Systems Using Root Locus Technique		Ogata K., 'Modern Control Engineering',
5	Designing Control Systems Using Root Locus Technique		Ogata K., 'Modern Control Engineering',
6	Designing Control Systems Using Root Locus Technigu		Ogata K., 'Modern Control Engineering',
7	Designing Control Systems Using Root Locus Technigu		Ogata K., 'Modern Control Engineering',
8	Midterm Exam		
9	Frequency Response:- Basic Definition and Properties- Bode Diagram- Nyquist Diagram and Nichols Chart- Stability in Freqı		Ogata K., 'Modern Control Engineering',
10	Frequency Response:- Basic Definition and Properties- Bode Diagram- Nyquist Diagram and Nichols Chart- Stability in Freqı		Ogata K., 'Modern Control Engineering',
11	Designing Control Systems Using Frequency Response Technique		Ogata K., 'Modern Control Engineering',
12	Designing Control Systems Using Frequency Response Technique		Ogata K., 'Modern Control Engineering',
13	Designing Control Systems Using Frequency Response Technique		Ogata K., 'Modern Control Engineering',
14	Designing Control Systems Using Frequency Response Technique		Ogata K., 'Modern Control Engineering',
15	Final 1st week		
16	Final 2. week		

Course Learning Outcomes

No	Learning Outcomes
C01	Köklerin geometrik yeri grafiklerini oluşturma ve yorumlayabilme becerisi
C02	Bir geribeslemeli kontrol sistemini köklerin geometrik yeri yöntemi ile tasarlama becerisi
C03	Nyquist ve Bode grafiklerini oluşturma ve yorumlayabilme becerisi
C04	Ability to design controllers of a feedback system by frequency response methods

Program Learning Outcomes

No	Learning Outcome
P03	To have the ability to use modern technical tools which are necessary for engineering applications and to efficiently implement information technologies.
P02	To be able to design a complicated system or device that can satisfy the requirements under realistic conditions; to have the ability to use modern design methods for that purpose.
P04	To have the ability to detect, define, formulize and solve complicated engineering problems.
P06	To have the ability to design experiments, analyze and interpret results in order to examine engineering problems.
P05	To be able to choose and apply modeling and analysis methods for the encountered problems.
P01	To have the ability of modeling and solving engineering problems, using the acquired information about math, science and engineering subjects.
P08	To have the ability to construct verbal and written communication in educational language.
P07	To have the ability to work in disciplinary and interdisciplinary teams efficiently.
P09	To be able to act conscious for the necessity of innovation and lifetime-learning; to have the ability of self-renewal and to follow the progress.
P11	To be able to have tendency to the applications in professional life and creativity.
P10	To have the ability to act with a sense of professional and ethical responsibility; and with environmental and safety concerns.

Assessment Methods and Criteria

In-Term Studies	Quantity	Percentage
Midterm exams	1	%20
Quizzes	4	%20
Homeworks	0	%0
Other activities	0	%0
Laboratory works	0	%0
Projects	1	%20
Final examination	1	%40
Total		**%100**

ECTS Allocated Based on Student Workload

Activities	Quantity	Duration	Total Work Load
Weekly Course Time	1	30	30
Outside Activities About Course (Attendance, Presentation, Midterm exam,Final exam, Quiz etc.)	1	60	60
Application (Homework, Reading, Self Study etc.)	0	0	0
Laboratory	0	0	0
Exams and Exam Preparations	1	30	30
Total Work Load			**120**
ECTS Credit of the Course			**5**

Contribution of Learning Outcomes to Programme Outcomes

Contribution: 0: Null 1:Slight 2:Moderate 3:Significant 4:Very Significant

	P01	P02	P03	P04	P05	P06	P11
C01	4	2	1	2	4	1	
C02	2	4		1	1		1
C03	4	2	1	2	4	1	
C04	2	4		1	1		1