COURSE DESCRIPTION FORM	
Course Code and Title	KM470 CONTROL ENGİNEERİNG PROBLEMS
Course Semester	8
Catalog Description (Content) of the Course	Introduction and basic informations. Transient response analysis of continious-time systems. Transient response of discrete-time systems. Root-Locus plots. Nyquist plots. Frequency-response plots.
Main Textbook	1. Ogata K., Modern Control Engineering, Fifth Edition, Prentice Hall,New York, 2010.
Supporting Textbooks	1. Stephanopoulos, G., Chemical ProcessControl: An Introduction to Theory and Practice, Prentice Hall,New Jersey ,1984. 2. B. Wayne Bequette, Process Control: Modeling, Design, and Simulation, Prentice Hall PTR, 2002. 3. Ogata K., Solving Control Engineering Problems with MATLAB, Prentice-Hall International, 1994. 4. Shahian, B., and Hassul, M., Control system design using Matlab, Prentice-Hall, New Jersey, 1993. 5. Norman Nice, Control Sysytems Engineering , John Wiley & Sons Inc., Ney York, 2011. 6. W.L. Luyben and M.L. Luyben, Essentials of Process Control, McGraw Hill, Inter. Ed., Singapore, 1997. 7. W.L. Luyben, Chemical Reactor Design and Control, John Wiley & Sons, New Jersey, Canada, 2007.
Course Credit (ECTS)	4
Prerequisites of the Course (Compulsory attendance should be indicated here.)	It is recommended to take ChE-473 Process Control Lectures, Compulsory attendance (70 %)
Type of the Course	Elective
Instruction Language of the Course	Turkish
Object and Target of the Course	To teach solving methods of control engineering problems by a computer aided approach.
Learning Outcomes of the Course	Rapid determination of the behaviour of controlled process. The ability to use of the related softwares. To cause team-work and use of computer.
Mode of Delivery	There is no prerequisite or co-requisite for this course

Weekly Schedule of the Course	Weeks	Topics
	1	Introduction to Control Systems
	2	Mathematical Modeling of Control Systems
	3	Laplace Transforms
	4	Solution of Linear Differential Equations using Laplace Transforms
	5	Mathematical Modeling of Mechanical Systems and Electrical Systems
	6	Mathematical Modeling of Fluid Systems and Thermal Systems
	7	Mathematical Modeling of Fluid Systems and Thermal Systems
	8	Transient and Steady-State Response Analyses
	9	Control Systems Analysis and Design by the Root-Locus Method
	10	Control Systems Analysis and Design by the Frequency-Response Method
	11	PID Controllers and Modified PID Controllers
	12	Control Systems Analysis in State Space
	13	Control Systems Analysis in State Space
	14	Selected Topics on Control Engineering Problems

Educative Activities *(Credit will be determined based on the time given for these activities. Should be filled carefully.)*	Theoretical Study Hours of Course Per Week Reading Searching in Internet and Library Preparing Reports Preparing Presentation Presentation Mid-Term and Studying for Mid-Term Final and Studying for Final		

Assessment Criteria		Sayı	Toplam Katkı (%)
	Midterm	2	25
	Homework		
	Assignment		
	Projects	1	10
	Practice		
	Quiz		
	Contribution of In-term Studies to Overall Grade	60	
	Contribution of Final Examination to Overall Grade	40	
	Attendance		

Workload of the Course	Ekinlik	Hafta sayısı	Süre Saat/Hafta	D.Sonu toplam iş yükü
	Theoretical Study Hours of Course Per Week	14	3	42
	Practising Hours of Course Per Week			
	Reading	7	2	14
	Searching in Internet and Library	7	2	14
	Designing and Applying Materials			
	Preparing Reports	1	6	6
	Preparing Presentation	1	6	6
	Presentation	1	1	1
	Mid-Term and Studying for Mid-Term	2	6	12
	Final and Studying for Final	1	5	5
	Other			
	Total Workload			100
	Workload / 25			4
	ECTS Credit			**4**

Course's Contribution To Program	Num.	Program Ourcomes	1	2	3	4	5
	1	Adequate knowledge in mathematics, science and engineering subjects pertaining to the relevant discipline; ability to use theoretical and applied information in these areas to model and solve engineering problems.				×	
	2	Ability to identify, formulate, and solve complex engineering problems; ability to select and apply proper analysis and modeling methods for this purpose.			×		
	3	Ability to design a complex system, process, device or product under realistic constraints and conditions, in such a way as to meet the desired result; ability to apply modern design methods for this purpose.				×	
	4	Ability to devise, select, and use modern techniques and tools needed for engineering practice; ability to employ information technologies effectively.			×		
	5	Ability to design and conduct experiments, gather data, analyze and interpret results for investigating engineering problems.		×			
	6	Ability to work efficiently in intra-disciplinary teams.				×	

7	Ability to work efficiently in multi-disciplinary teams;			×		
8	Ability to work individually.				×	
9	Ability to communicate effectively in Turkish/English, both orally and in writing; Ability to write effective reports and comprehend written reports, make effective presentations,				×	
10	prepare design and production reports, give and receive clear and intelligible instructions.				×	
11	Recognition of the need for lifelong learning; ability to access information, to follow developments in science and technology, and to continue to educate him/herself.		×			
12	Awareness of professional and ethical responsibility.	×				
13	Information about business life practices such as project management, risk management, and change management.	×				
14	Information about awareness of entrepreneurship, innovation, and sustainable development.	×				
15	Knowledge about contemporary issues and the global and societal effects of engineering practices on health, environment, and safety.	×				
16	Knowledge about awareness of the legal consequences of engineering solutions.	×				
17	Knowledge on standards used in engineering practice.	X				

Name of Lecturer(s) and Contact Iınformation	1. Prof. Dr. Muzaffer BALBAŞI , mbalbasi@gazi.edu.tr 2. 3.