1. Course Description

<table>
<tr><th colspan="2">COURSE DESCRIPTION FORM</th></tr>
<tr><td>Course Code and Title</td><td>CHE473 PROCESS CONTROL</td></tr>
<tr><td>Course Semester</td><td>7</td></tr>
<tr><td>Catalog Description (Content) of the Course</td><td>Basic process elements,Components and Controllers; Study of open and closed circuit systems;Frequency response method;Process applications</td></tr>
<tr><td>Main Textbook</td><td>D.R. Coughanowr, “Process Systems Analysis and Control”, 2nd edition, Mc-GrawHill,NewYork, 3rd Edition, 2008.</td></tr>
<tr><td>Supporting Textbooks</td><td>1. SeborgD.E.,Edgar T.F.,Mellichamp D.A., “Process Dynamics and Control “, Wiley,NY, 3rd Edition, 2011.
2. SeborgD.E.,Edgar T.F.,MellichampD.A.,DoyleF.J., “Proses DinamiğiveKontrolü”, Çevirenler, Prof. Dr. NiyaziAlperTapan ,Prof. Dr. SebahatErdoğan, Nobel yayınevi, 2013.
3. G. Stephanopoulos, “Chemical Process Control:An Introduction to theory and Practice”,Prentice-Hall, 1984.</td></tr>
<tr><td>Course Credit (ECTS)</td><td>6</td></tr>
<tr><td>Prerequisites of the Course (Compulsory attendance should be indicated here.)</td><td>There is no prerequisite for this course.
There is 70% attendance requirement.</td></tr>
<tr><td>Type of the Course</td><td>Theoretical</td></tr>
<tr><td>Instruction Language of the Course</td><td>English</td></tr>
<tr><td>Object and Target of the Course</td><td>To teach fundamental concepts of process dynamics and control; To give an introduction to design and analysis of process systems</td></tr>
<tr><td>Learning Outcomes of the Course</td><td>1.To teach fundamental concepts of process dynamics and control;
2. To analyze the control systems
3. To give an introduction to design and analysis of control systems
4. To analyze the stability of controlled process</td></tr>
<tr><td>Mode of Delivery</td><td>Face to face education</td></tr>
<tr><td>Weekly Schedule of the Course</td><td>1. Week: Introduction Laplace Transformation
2. Week: Linearization and Transfer Functions
3. Week: Response of First Order Systems
4. Week: Response of First Order Systems in Series
5. Week: Response of Second Order Systems and Transportation lag
6. Week: Response of Second Order Systems and Transportation lag
7. Week: Closed Loop Control Systems
8. Week: Transient Response of Simple Control Systems
9. Week: Closed Loop Transfer Functions
10. Week: Closed Loop Transfer Functions
11. Week: Stability analysis
12. Week: Frequency Response Methods,Bode Diagrams
13. Week: Frequency Response Methods,Bode Diagrams
14. Week: Control System Design and applications.</td></tr>
<tr><td>Educative Activities
(Credit will be determined based on the time given for these activities. Should be filled carefully.)</td><td>Theoretical Study Hours of Course Per Week
Reading
Searching in Internet and Library
Designing and Applying Materials
Preparing Reports
Mid-Term and Studying for Mid-Term
Final and Studying for Final</td></tr>
<tr><td>Assessment Criteria</td><td>
<table>
<tr><th></th><th>Quantity</th><th>Total Contribution (%)</th></tr>
<tr><td>Midterm</td><td>2</td><td>40</td></tr>
<tr><td>Homework (min.)</td><td>2</td><td>5</td></tr>
<tr><td>Assignment</td><td>0</td><td>0</td></tr>
<tr><td>Projects</td><td>1</td><td>10</td></tr>
<tr><td>Practice</td><td>0</td><td>0</td></tr>
</table>
</td></tr>
</table>

Workload of the Course

Activity	Total Week Count	Weekly Duration (in hour)	Total Workload in Semester
Theoretical Study Hours of Course Per Week	14	3	42
Practicing Hours of Course Per Week	0	0	0
Reading	14	3	42
Searching in Internet and Library	5	5	25
Designing and Applying Materials	2	2	4
Preparing Reports	4	3	12
Preparing Presentation	0	0	0
Presentation	0	0	0
Mid-Term and Studying for Mid-Term	2	3	6
Final and Studying for Final	1	10	10
Other	0	0	0
Total work load			141
Total work load/25			5.64
ECTS of the course			6

Course's Contribution To Program

No	Program Learning Outcomes	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.					X
2	Ability to identify, formulate, and solve complex engineering problems; ability to select and apply proper analysis and modeling methods for this purpose.					X
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.			X		
4	Ability to devise, select, and use modern techniques and tools needed for engineering practice; ability to employ information technologies effectively.			X		
5	Ability to design and conduct experiments, gather data, analyze and interpret results for investigating engineering problems.			X		
6	Ability to work efficiently in intra-disciplinary teams.			X		
7	Ability to work efficiently in multi-disciplinary teams;			X		
8	Ability to work individually.			X		
9	Ability to communicate effectively in Turkish/English, both orally and in writing; Ability to write effective reports and comprehend written			X		

		reports, make effective presentations,						
	10	Prepare design and production reports, give and receive clear and intelligible instructions.		X				
	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.		X				
	12	Awareness of professional and ethical responsibility.	X					
	13	Information about business life practices such as project management, risk management, and change management.	X					
	14	Information about awareness of entrepreneurship, innovation, and sustainable development.	X					
	15	Knowledge about contemporary issues and the global and societal effects of engineering practices on health, environment, and safety.	X					
	16	Knowledge about awareness of the legal consequences of engineering solutions.	X					
	17	Knowledge on standards used in engineering practice.	X					

Name of Lecturer(s) and Contact Information	1. Prof. Dr. SebahatERDOĞAN, E-mail: sebaer@gazi.edu.tr 2. Prof. Dr. NiyaziAlperTAPAN, E-mail: atapan@gazi.edu.tr