

## 1. Course Description

COURSE DESCRIPTION FORM																							
Course Code and Title	CHE326 STEAM SYSTEMS AND ENERGY EFFICIENCY																						
Course Semester	6																						
Catalog Description (Content) of the Course	Buharın oluşumu, buhar sistemlerinde ısı transferine engel olan durumlar, vuruntu ve sisteme etkisi, kondens geri kazanımı, buhar kapılarının işlevleri ve çeşitleri, ana buhar hattının tasarımı																						
Main Textbook	<input type="checkbox"/> "Efficient Use of Process Steam", TLV, Co.ltd., 1996.																						
Supporting Textbooks	<input type="checkbox"/> Babcock & Wilcox, "STEAM/ITS GENERATION AND USE", 42ND Edition, 2018 <input type="checkbox"/> Dryden, I.G.C. "The Efficient Use of Energy" 2. Ed. Butterworth & Co Ltd., 1982. <input type="checkbox"/> "Energy Manager's Workbook", British Institutes of Management and the Department of Energy, Great Britain, 1982.																						
Course Credit (ECTS)	3																						
Prerequisites of the Course (Compulsory attendance should be indicated here.)	-																						
Type of the Course	Elective																						
Instruction Language of the Course	English																						
Object and Target of the Course	Introduction, Importance of Energy Efficiency and Related concepts																						
Learning Outcomes of the Course	To gain the ability of define, formulate and to solve the engineering problems. To gain the concisnous about the social and global effects of the engineering applications																						
Mode of Delivery																							
Weekly Schedule of the Course	<table> <tr> <td>1. Week</td><td>Introduction, Importance of Energy Efficiency and Related concepts</td></tr> <tr> <td>2. Week</td><td>Steam formation, Properties, Steam tables</td></tr> <tr> <td>3. Week</td><td>Heat transfer, Factors preventing heat transfer, Indirect heating by using steam</td></tr> <tr> <td>4. Week</td><td>Flash steam formation and Flash steam energy saving applications</td></tr> <tr> <td>5. Week</td><td>Equipments in steam lines and design of steam pipe-lines</td></tr> <tr> <td>6. Week</td><td>Equipments in steam lines and design of steam pipe-lines (Continue)</td></tr> <tr> <td>7. Week</td><td>Energy loss due to leakage in steam pipes and Required precautions to prevent these leakages</td></tr> <tr> <td>8. Week</td><td>Removal of condansate, Drainage mistakes and necessary precautions</td></tr> <tr> <td>9. Week</td><td>Condensate recycle and energy saving example</td></tr> <tr> <td>10. Week</td><td>Steam traps; Types, Working principles</td></tr> <tr> <td>11. Week</td><td>Steam traps; Types, Working principles (Continue)</td></tr> </table>	1. Week	Introduction, Importance of Energy Efficiency and Related concepts	2. Week	Steam formation, Properties, Steam tables	3. Week	Heat transfer, Factors preventing heat transfer, Indirect heating by using steam	4. Week	Flash steam formation and Flash steam energy saving applications	5. Week	Equipments in steam lines and design of steam pipe-lines	6. Week	Equipments in steam lines and design of steam pipe-lines (Continue)	7. Week	Energy loss due to leakage in steam pipes and Required precautions to prevent these leakages	8. Week	Removal of condansate, Drainage mistakes and necessary precautions	9. Week	Condensate recycle and energy saving example	10. Week	Steam traps; Types, Working principles	11. Week	Steam traps; Types, Working principles (Continue)
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	12. Week	Energy loss from steam traps		
	13. Week	Test of steam traps and Steam trap management sysstem		
	14. Week	Technical visit to a plant in which various types of steam traps are used		
<b>Educative Activities</b> <i>(Credit will be determined based on the time given for these activities. Should be filled carefully.)</i>	Theoretical Study Hours of Course Per Week Reading Searching in Internet and Library Mid-Term and Studying for Mid-Term Final and Studying for Final			
<b>Assessment Criteria</b>		<b>Quantity</b>	<b>Total Contribution (%)</b>	
	Midterm	2	30	
	Homework	4	20	
	Assignment	0	0	
	Projects	1	10	
	Practice	0	0	
	Quiz	0	0	
	Contribution of In-term Studies to Overall Grade		60	
	Contribution of Final Examination to Overall Grade		40	
	Attendance			
<b>Workload of the Course</b>	<b>Activity</b>	<b>Total Week Count</b>	<b>Weekly Duration (in hour)</b>	<b>Total Workload in Semester</b>
	Theoretical Study Hours of Course Per Week	14	3	42
	Practicing Hours of Course Per Week			
	Reading	7	1	7
	Searching in Internet and Library	6	2	12
	Designing and Applying Materials			
	Preparing Reports			
	Preparing Presentation			
	Presentation			
	Mid-Term and Studying for Mid-Term	2	5	10
	Final and Studying for Final	1	3	3
	Other			
	Total work load			77
	Total work load/25			3.08
	ECTS of the course			

Course's Contribution To Program	Number	Program 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. (Realistic constraints and conditions may include factors such as economic and environmental issues, sustainability, manufacturability, ethics, health, safety issues, and social and political issues, according to the nature of the design.)					
	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.					
	6	Ability to work efficiently in intra-disciplinary teams.					
	7	Ability to work efficiently in multi-disciplinary teams.					
	8	Ability to work individually.			X		
	9	Ability to communicate effectively in Turkish, both orally and in writing; knowledge of a minimum of one foreign language.		X			
	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.		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.İrfan Ar						