

<b>Course Description Form</b>	
<b>Course Code and Name</b>	ME203 Thermodynamics-I
<b>Course Semester</b>	3
<b>Catalog Content</b>	System and its surroundings, properties of a substance, Thermodynamic equilibrium, ideal gas equation of state, energy. Transfer of energy between system and its surrounding, change state and thermodynamic process, reversible and irreversible processes, simple system, enthalpy, constant-volume and constant-pressure specific heats, pure substance thermodynamic surfaces. The first law of thermodynamics for a control volume, the second law of thermodynamics, entropy, numerical value of entropy. The second law of thermodynamics for a control volume, efficiency, Thermodynamical analysis of processes, the third law of thermodynamics.
<b>Textbook</b>	C. Borgnakke, R. E. Sonntag, "Fundamentals of Thermodynamics", Enhanced eText, 9th Edition, Wiley, 2017, 816 pages. ISBN: 978-1-119-32145-3
<b>Supplementary Textbooks</b>	<ol style="list-style-type: none"> <li>1. M. J. Moran, H. N. Shapiro, D. D. Boettner, M. B. Bailey, "Fundamentals of Engineering Thermodynamics", 8th Edition, Wiley, 2014, 1056 pages, ISBN: 978-1-118-83231-8</li> <li>2. Y. Cengel and M. Boles, Thermodynamics: An Engineering Approach, 8<sup>th</sup> Edition, Mc Graw Hill 2015.</li> </ol>
<b>Credit</b>	5
<b>Prerequisites of the Course (Attendance Requirements)</b>	None
<b>Type of the Course</b>	Compulsory
<b>Instruction Language</b>	English
<b>Course Objectives</b>	To teach basic principles of classical thermodynamics. To train students to identify, formulate and solve engineering problems in thermodynamics. To teach the application of second law analysis methods for thermodynamic systems.
<b>Course Learning Outcomes</b>	<ol style="list-style-type: none"> <li>1. Gaining the ability to find thermodynamic properties.</li> <li>2. Gaining the ability to apply the First Law of Thermodynamics on closed systems</li> <li>3. Gaining the ability to apply the First Law of Thermodynamics on open systems</li> <li>4. Gaining the ability to apply the Second Law of Thermodynamics.</li> <li>5. Gaining the ability to understand and apply the exergy analysis.</li> </ol>
<b>Instruction Methods</b>	Face to face
<b>Weekly Schedule</b>	<ol style="list-style-type: none"> <li>1. Week Basic Concepts of Thermodynamics</li> <li>2. Week Properties of Pure Substances</li> <li>3. Week The First Law of Thermodynamics: Closed Systems</li> <li>4. Week The First Law of Thermodynamics: Closed Systems</li> <li>5. Week The First Law of Thermodynamics: Control Volume</li> <li>6. Week The First Law of Thermodynamics: Control Volume</li> <li>7. Week The Second Law of Thermodynamics</li> <li>8. Week 1. Midterm The Second Law of Thermodynamics</li> <li>9. Week The Second Law of Thermodynamics</li> <li>10. Week Entropy</li> <li>11. Week Entropy</li> <li>12. Week Entropy</li> <li>13. Week 2. Midterm Exergy: A measure of work potential</li> </ol>

	14. Week Exergy: A measure of work potential 15. Week Final Exam								
<b>Teaching and Learning Methods</b> <i>(These are examples. Please fill which activities you use in the course)</i>	Weekly theoretical course hours: 3 Weekly applied course hours: 0 Reading Activities: none Internet browsing, library work: none Designing and implementing materials: none Report preparing: none Preparing a Presentation: none Presentations: none Preparation of Midterm and Midterm Exam: 3 Final Exam and Preparation for Final Exam: 3								
<b>Assessment Criteria</b>		<b>Numbers</b>	<b>Total Weighting (%)</b>						
	Midterm Exams	2	40						
	Assignment	5	10						
	Application	-	-						
	Projects	-	-						
	Practice	-	-						
	Quiz	3	10						
	Percent of In-term Studies (%)	-	-						
	Percentage of Final Exam to Total Score (%)	1	40						
Attendance	-	-							
<b>Workload</b>	<b>Activity</b>	<b>Total Number of Weeks</b>	<b>Duration (weekly hour)</b>	<b>Total Period Work Load</b>					
	Weekly Theoretical Course Hours	16	3	48					
	Weekly Tutorial Hours	4	2	8					
	Reading Tasks								
	Studies								
	Material Design and Implementation								
	Report Preparing								
	Preparing a Presentation								
	Presentations								
	Midterm Exam and Preperation for Midterm Exam	2	6	12					
	Final Exam and Preperation for Final Exam	2	6	12					
	Other (Preparation to Quiz)	3	3	9					
	Total Workload			89					
	Total Workload / 25			3.56					
Course Credit (ECTS)			4						
<b>Contribution Level Between Course Learning Outcomes and Program Outcomes</b>	No	<b>Program Outcomes</b>			1	2	3	4	5
	1	Engineering graduates with sufficient theoretical and practical background for a successful profession and with application skills of fundamental scientific knowledge in the engineering practice.						X	
	2	Engineering graduates with skills and professional background in describing, formulating, modeling and analyzing the engineering problem, with a consideration for appropriate analytical solutions in all necessary situations							X

	3	Engineering graduates with the necessary technical, academic and practical knowledge and application confidence in the design and assessment of machines or mechanical systems or industrial processes with considerations of productivity, feasibility and environmental and social aspects.							X	
	4	Engineering graduates with the practice of selecting and using appropriate technical and engineering tools in engineering problems, and ability of effective usage of information science technologies		X						
	5	Ability of designing and conducting experiments, conduction data acquisition and analysis and making conclusions								
	6	Ability of identifying the potential resources for information or knowledge regarding a given engineering issue								
	7	The abilities and performance to participate multi-disciplinary groups together with the effective oral and official communication skills and personal confidence							X	
	8	Ability for effective oral and official communication skills in Turkish Language and, at minimum, one foreign language		X						
	9	Engineering graduates with motivation to life-long learning and having known significance of continuous education beyond undergraduate studies for science and technology								
	10	Engineering graduates with well-structured responsibilities in profession and ethics								
	11	Engineering graduates who are aware of the importance of safety and healthiness in the project management, workshop environment as well as related legal issues								
	12	Consciousness for the results and effects of engineering solutions on the society and universe, awareness for the developmental considerations with contemporary problems of humanity								
	<b>The Course's Lecturer(s) and Contact Informations</b>		<ol style="list-style-type: none"> <li>1. <a href="mailto:abiyik@gazi.edu.tr">abiyik@gazi.edu.tr</a>, Atilla, Bıyıkoğlu</li> <li>2. <a href="mailto:oturgut@gazi.edu.tr">oturgut@gazi.edu.tr</a>, Oğuz Turgut</li> <li>3. <a href="mailto:pirasaci@gazi.edu.tr">pirasaci@gazi.edu.tr</a>, Tolga Pırasacı</li> </ol>							