Course Description Form	
Course Code and Name	ME204 Thermodynamics-II
Course Semester	4
Catalog Content	Thermodynamic relations, fundamental relations for simple compressible system, mixtures of pure substances, some power refrigeration cycles, vapor power cycles, air-standard power cycles, air standard refrigeration cycles, chemical reactions, combustion process, enthalpy of formation, enthalpy of combustion, higher and lower heating values of fuels, theoretical reaction temperature, adiabatic flame temperature, chemical equilibrium, equilibrium constant, one-dimensional flow of compressible fluids.
Textbook	1) Sonntag, R.E., Borgnakke, C. And Van Wylen, G.J., Fundamentals of Thermodynamics, John Wiley, 7th Ed., 2009, 777 pages. 2) Thermodynamics: An Engineering Approach, Y.A. Çengel and M.A. Boles 3) Michael J. Moran, Howard N. Shapiro, Daisie D. Boettner, Margaret B. Bailey, Principles of Engineering Thermodynamics, 8th Edition, 2015, John Wiley & Sons, Inc. ISBN: 978-1-118-96088-2
Supplementary Textbooks	
Credit	5
Prerequisites of the Course (Attendance Requirements)	There is prerequisite for the course of ME203 Thermodymanics-I.
Type of the Course	Compulsory
Instruction Language	English
Course Objectives	Students should be able to analyze the power and cooling cycles, determine the thermodynamic properties, solve engineering problems related to the processes of psychrometrics applications and chemical and phase balance in the combustion processes of thermodynamic laws.
Course Learning Outcomes	1. Learning the methods used to calculating states and performance parameters for power and refrigeration cycles. 2. Gaining the ability to determine the relations among thermodynamic properties. 3. To use equations, tables and diagrams to determine the states of gas mixtures and to learn engineering knowledge about air conditioning. 4. Learning the methods to analyze systems involving combustion processes and to determine equilibrium states for chemically reacting and multiphase systems.
Instruction Methods	The mode of delivery of this course is face to face.
Weekly Schedule	1. Week: Vapor Power Systems 2. Week: Vapor Power Systems 3. Week: Gas Power Systems 4. Week: Gas Power Systems 5. Week: Refrigeration and Heat Pump Systems 6. Week: Refrigeration and Heat Pump Systems 7. Week: Thermodynamic Relations 8. Week: 1. Midterm Thermodynamic Relations 9. Week: Ideal Gas Mixtures and Psychrometrics Applications 10. Week: Ideal Gas Mixtures and Psychrometrics Applications 11. Week: Reacting Mixtures and Combustion 12. Week: Reacting Mixtures and Combustion

	13. Week: 2. Midterm Chemical and Phase Equilibrium 14. Week: Chemical and Phase Equilibrium 15. Week : Final Exam
Teaching and Learning Methods *(These are examples. Please fill which activities you use in the course)*	Weekly theoretical course hours: 3 Weekly applied course hours: 0 Reading Activities: 3 Internet browsing, library work Designing and implementing materials Report preparing Preparing a Presentation Presentations Preparation of Midterm and Midterm Exam: 6 Final Exam and Preparation for Final Exam: 3

Assessment Criteria

	Numbers	Total Weighting (%)
Midterm Exams	2	60
Assignment	-	-
Application	-	-
Projects	-	-
Practice	-	-
Quiz	-	-
Percent of In-term Studies (%)		60
Percentage of Final Exam to Total Score (%)		40
Attendance	-	-

Workload

Activity	Total Number of Weeks	Duration (weekly hour)	Total Period Work Load
Weekly Theoretical Course Hours	15	3	45
Weekly Tutorial Hours			
Reading Tasks	15	3	45
Studies			
Material Design and Implementation			
Report Preparing			
Preparing a Presentation			
Presentations			
Midterm Exam and Preperation for Midterm Exam	4	6	24
Final Exam and Preperation for Final Exam	4	3	12
Other (should be emphasized)			
Total Workload			126
Total Workload / 25			5.04
Course Credit (ECTS)			5.0

Contribution Level Between Course Learning Outcomes and Program Outcomes

No	Program Outcomes	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					X

		consideration for appropriate analytical solutions in all necessary situations						
	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		X				
	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			X			
	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			X			

The Course's Lecturer(s) and Contact Informations	1. Prof. Dr. Atilla Bıyıkoğlu E-mail address: abiyik@gazi.edu.tr 2. Assoc. Prof. Dr. Oğuz Turgut E-mail address: oturgut@gazi.edu.tr