Course Information

COURSE INFORMATION

Course Title	Code	Semester	L+U Hour	Credits	ECTS
Thermodynamics and Statistical Physics	FZK461	7. Semester	3 + 2	4.0	7.0

Prerequisites	None
Language of Instruction	Turkish
Course Level	Bacheclor's Degree (First Cycle)
Course Type	Compulsory
Mode of delivery	Face to face
Course Coordinator	Prof. Dr. Caner ÇİÇEK
Instructors	Prof. Dr. Caner ÇİÇEK
Assistants	
Course Objectives	This course aims to get across the basic laws of thermodynamics.
Course Content	In this lecture, the basic laws of thermodynamics, the characteristic properties of their microscopic and macroscopic states, kinetic theory of gases, statistical principle of thermodynamics, concept of probability, the quantum and statistical origin of probability, the concept of distribution function, thermal interactions, entropy and temperature, canonical distributions and their applications, introduction to Fermi-Dirac and Bose-Einstein statistics are examined.
Course Learning Outcomes	1) Describe the laws of classical thermodynamics and their applications. 2) Explain elementary probability theory. 3) Interpret Carnot cycle, Heat engine and absolute zero concepts 4) Comprehend distribution function and their applications in the statistical physics. 5) Explain black-body radiation and Stephan-Boltzmann law.

WEEKLY COURSE CONTENT

Week	Topics	Teaching and Learning Methods and Techniques	Study Materials
1. Week	Kinetic theory of ideal gases, pressure, work, chemical potential heat and heat capacity, reversible and irreversible process	Oral lectures with interactive discussions, Homeworks, Applications	
2. Week	Carnot cycle and second law of thermodynamics	Oral lectures with interactive discussions, Homeworks, Applications	

Quick Access

Physics
- Qualification Awarded
- Level of Qualification
- Qualification Requirements and Regulations
- Specific Admission Requirements
- Recognition of Prior Learning
- Profile of the Program
- Program Key Learning Outcomes
- Occupational Profile of Graduates
- Access to Further Studies
- Course Structure & Credits
- Exam Regulations & Assessment & Grading
- Graduation Requirements
- Mode of Study
- Programme Director(or Equivalent)
- Evaluation Questionnaire
- TYYÇ

Course Information
- Course Information
- Weekly Course Content
- Resources
- Assessment
- Course Category
- CONTRIBUTION OF COURSE LEARNING OUTCOMES TO PROGRAMME OUTCOMES
- ECTS credits and course workload

3. Week	Thermodynamic potentials	Oral lectures with interactive discussions, Homeworks, Applications	
4. Week	Kirchhoff equations for Entropy and internal energy	Oral lectures with interactive discussions, Homeworks, Applications	
5. Week	Equilibrium theory of thermodynamics systems	Oral lectures with interactive discussions, Homeworks, Applications	
6. Week	The Gibbs Phase rule	Oral lectures with interactive discussions, Homeworks, Applications	
7. Week	Phase space and Liouville theorem	Oral lectures with interactive discussions, Homeworks, Applications	
8. Week	Midterm Exam	Oral- Written Exam	
9. Week	Probability theory	Oral lectures with interactive discussions, Homeworks, Applications	
10. Week	Gibbs canonical ensemble	Oral lectures with interactive discussions, Homeworks, Applications	
11. Week	equipartition theorem	Oral lectures with interactive discussions, Homeworks, Applications	
12. Week	Maxwell distribution	Oral lectures with interactive discussions, Homeworks, Applications	
13. Week	Heat capacities for solids and gases consist of two or more atoms	Oral lectures with interactive discussions, Homeworks, Applications	
14. Week	Application of classical statistic to radiation, Van der Waals equation	Oral lectures with interactive discussions, Homeworks, Applications	
15. Week	Gibbs distribution in quantum statistics	Oral lectures with interactive discussions, Homeworks, Applications	
16. Week	Final Exam	Written, oral exam	

RESOURCES

Recommended Sources

Walter Greiner, Ludwig Neise, Horst Stöcker;1995, Thermodynamics and Statistical Mechanics, Springer, 3rd printing,
F.Reif, 1990, Statistical Physics, Berkeley Physics Series Vol 5, Bilim Press, Ankara, .
Physics for Science and Engineering; Modern Physics included, R.A.Serway, Vol 2, K.Çolakoğlu, Palme Press , Ankara, 1996.
Statistical Physics. Part1. L. Landau and E. Lifshits. Pergamon Press. 1971

ASSESSMENT

Measurement and Evaluation Methods and Techniques		
Mid-term exam (%40) , final exam (%60)		
In-Term Studies	**Quantity**	**Percentage**
Mid Term Exam 1	1	40
Total	1	40
End-Term Studies	**Quantity**	**Percentage**
Final Exam	1	60
Total	1	60
Contribution Of In-Term Studies To Overall Grade		40
End-Term Studies		60
Total		100

COURSE CATEGORY

Course Category	Percentage
Core Courses	% 100

CONTRIBUTION OF COURSE LEARNING OUTCOMES TO PROGRAMME OUTCOMES

Programme Outcomes	Contribution Level	DK1	DK2	DK3	DK4	DK5
PY1	4	4	4	4	4	4
PY2	3	3	3	3	3	3
PY3	3	3	3	3	3	3
PY4	3	3	3	3	3	3
PY5	4	4	4	4	4	4
PY6	4	4	4	4	4	4
PY7	3	3	3	3	3	3
PY8	3	3	3	3	3	3
PY9	3	3	3	3	3	3
PY10	3	3	3	3	3	3
PY11	4	4	4	4	4	4
PY12	3	3	3	3	3	3
PY13	3	3	3	3	3	3
PY14	3	3	3	3	3	3
PY15	3	3	3	3	3	3

*DK = Course's Contrubution.

	0	1	2	3	4	5

Level of contribution	None	Very Low	Low	Fair	High	Very High

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ECTS CREDITS AND COURSE WORKLOAD

Event	Quantity	Duration (Hour)	Total Workload (Hour)
Final Exam	1	2	2
Mid Term Exam 1	1	2	2
Application/Practice	14	2	28
Class Hours (14 weeks)	14	5	70
Presentation/Seminar	1	5	5
Assignment 1	3	5	15
Assignment 2	5	5	25
Mid Term Exam Preparation	1	9	9
Final Exam Preparation	1	9	9
Further Study	14	1	14
		Total Workload	179
		Total Workload / 25.5 (s)	7.02
		ECTS Credit of the Course	7