Fizik Bölümü / PHYSICS /

Course Code	Course Name	Teorical	Practice	Laboratory	Credits	ECTS
FZK-4003	Thermodynamics and Statistical Physics	3.00	2.00	0.00	4.00	6.00

Course Detail

Course Language	:	Turkish
Qualification Degree	:	Bachelor
Course Type	:	Compulsory
Preconditions	:	Not
Objectives of the Course	:	To get across the basic laws of thermodynamics.
Course Contents	:	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.
Recommended or Required Reading	:	Walter Greiner, Ludwig Neise, Horst Stöcker;1995, Thermodynamics and Statistical Mechanics, Springer, 3rd printing, F.Reif,1990,İstatistik Fizik; Berkeley Fizik serisi, Cilt 5, Bilim Yayınları , Ankara Fen ve Mühendislik için Fizik : Modern Fizik ilaveli, R.A.Serway, cilt 2,Türkçe çeviri editörü: K.Çolakoğlu, Palme yayıncılık , Ankara, 1996 Statistical Physics. Part1. L. Landau and E. Lifshits. Pergamon Press. 1971
Planned Learning Activities and Teaching Methods	:	Oral lectures with interactive discussions, Homeworks, Applications
Recommended Optional Programme Components	:	Current research topics for student
Course Instructors	:	Prof. Dr. Caner Çiçek
Instructor's Assistants	:	Dr. Naci Erkan
Presentation Of Course	:	Face to face

Course Outcomes

Upon the completion of this course a student :

1 will be comprehend the laws of classical thermodynamics and their applications

2 will be understand elementary probability theory

3 will be understand Carnot cycle, Heat engine and absolute zero concepts

4 will be understand distribution function and their applications in the statistical physics.

5 will be comprehend black-body radiation and Stephan-Boltzmann law.

Preconditions

Course Code	Course Name	Teorical	Practice	Laboratory	Credits	ECTS

Weekly Contents

	Teorical	Practice	Laboratory	Preparation Info	Teaching Methods
1.Week	*Kinetic theory of ideal gases, pressure, work, chemical potential heat and heat capacity, reversible and irreversible process	*Kinetic theory of ideal gases, pressure, work, chemical potential heat and heat capacity, reversible and irreversible process			
2.Week	*Carnot cycle and second law of thermodynamics	*Carnot cycle and second law of thermodynamics			
3.Week	*Thermodynamic potentials	*Thermodynamics potentials			
4.Week	*Kirchhoff equations for Entropy and internal energy	*Kirchhoff equations for Entropy and internal energy			
5.Week	*Equilibrium theory of thermodynamics systems	*Equilibrium theory of thermodynamics systems			
6.Week	*The Gibbs Phase rule	*The Gibbs Phase rule			
7.Week	*Phase space and Liouville theorem	*Phase space and Liouville theorem			
8.Week	*Probability theory	*Probability theory			
9.Week	*Gibbs canonical ensemble	*The Gibbs Phase rule			
10.Week	*equipartition theorem	*equipartition theorem			
11.Week	*Maxwell distribution	*Maxwell distribution			
12.Week	*Heat capacities for solids and gases consist of two or more atoms	*Heat capacities for solids and gases consist of two or more atoms			
13.Week	*Application of classical statistic to radiation, Van der Waals equation	*Application of classical statistic to radiation, Van der Waals equation			
14.Week	*Gibbs distribution in quantum statistics	*Gibbs distribution in quantum statistics			

Assesment Methods %

1 Mid Term Exam 1 : 40.000

2 Final : 60.000

ECTS Workload

Activities	Count	Time(Hour)	Sum of Workload
Vize	1	2.00	2.00
Final	1	2.00	2.00
Individual study before lecture	14	2.00	28.00
Individual study after lecture	14	2.00	28.00
Preparation for midterm	1	25.00	25.00
Preparation for final	1	25.00	25.00
Class Hours (14 weeks)	14	5.00	70.00
		Total :	180.00
		Sum of Workload / 30 (Hour) :	6
		ECTS :	6.00

Program And OutcomeRelation

	P.O. 1	P.O. 2	P.O. 3	P.O. 4	P.O. 5	P.O. 6	P.O. 7	P.O. 8	P.O. 9	P.O. 10	P.O. 11	P.O. 12	P.O. 13	P.O. 14	P.O. 15	P.O. 16	P.O. 17	P.O. 18	P.O. 19	P.O. 20	P.O. 21	P.O. 22	P.O. 23	P.O. 24
L.O. 1	1	2	3	3	2	3	3	3	3	3	3	4	4	3	5	0	0	0	0	0	0	0	0	0
L.O. 2	2	3	3	2	3	3	3	4	2	3	1	2	2	3	2	0	0	0	0	0	0	0	0	0
L.O. 3	2	4	2	3	2	4	1	2	4	3	1	5	4	4	5	0	0	0	0	0	0	0	0	0
L.O. 4	2	3	3	4	3	4	2	3	3	4	3	3	3	4	5	0	0	0	0	0	0	0	0	0
L.O. 5	2	3	4	4	4	5	3	3	5	5	5	5	5	2	2	0	0	0	0	0	0	0	0	0

Ders/Program Çıktıları İlişkisi

P.O. 1	P.O. 2	P.O. 3	P.O. 4	P.O. 5	P.O. 6	P.O. 7	P.O. 8	P.O. 9	P.O. 10	P.O. 11	P.O. 12	P.O. 13	P.O. 14	P.O. 15	P.O. 16	P.O. 17	P.O. 18	P.O. 19	P.O. 20	P.O. 21	P.O. 22	P.O. 23	P.O. 24	P.O. 2
1	3	3	1	3	3	2	3	2	4	3	4	5	3	3	0	0	0	0	0	0	0	0	0	0