STATISTICAL PHYSICS

1	Course Title:	STATISTICAL PHYSICS
2	Course Code:	FZK4004
3	Type of Course:	Compulsory
4	Level of Course:	First Cycle
5	Year of Study:	4
6	Semester:	8
7	ECTS Credits Allocated:	8.00
8	Theoretical (hour/week):	5.00
9	Practice (hour/week):	0.00
10	Laboratory (hour/week):	0
11	Prerequisites:	Having taken the Statistics Physics Course
12	Language:	Turkish
13	Mode of Delivery:	Face to face
14	Course Coordinator:	Prof. Dr. Hüseyin Ovalıoğlu
15	Course Lecturers:	Prof. Dr. Ahmet PEKSÖZ, Dr. Öğr. Üy. Cengiz AKAY, Dr. Öğr. Üy. Handan Engin KIRIMLI,
16	Contact information of the Course Coordinator:	Doç. Dr. Hüseyin OVALIOĞLU E-mail: ovali@uludag.edu.tr İş Tel: 0 224 29 41 691 Adres: Bursa Uludağ Üniversitesi Fen Edebiyat Fakültesi Fizik Bölümü, 16059 Görükle Kampüsü BURSA
17	Website:	
18	Objective of the Course:	To teach the basics of statistical physics, to understand the laws and some applications of thermodynamics, to prepare for statistical mechanics.
19	Contribution of the Course to Professional Development:	To teach the basics of statistical physics, to understand the laws and some applications of thermodynamics, to prepare for statistical mechanics.
20	Learning Outcomes:	
	1	Can tell her opinion about the characteristics of macroscopic systems and make calculations.
	2	Knows basic probability concepts and can make operations with them.
	3	Will be able to define statistical particle systems.
	4	Have information about microscopic theory and macroscopic measurements.
	5	Understands and interprets thermal interaction.
	6	Knows the canonical distribution with classical approximation and can apply it to various situations.
	7	Understands general thermodynamic interaction and can do operations related to it.
	8	Learns the laws of thermodynamics and a few examples.
	9	Understands the simple kinetic theory of transport processes and can connect various physics phenomena. ;
	10	Knows the laws of distribution and can apply them.
21	Course Content:	

Course Content:

Week	Theoretical	Practice

1	Characteristic features of macroscopic systems: Fluctuations in equilibrium state, Irreversibility and approach to equilibrium, Properties of equilibrium state, Temperature and temperature, Important problems of macroscopic physics.	
2	Basic Probability Concepts: Statistical ensembles, Simple relations between probabilities, Binomial distribution, Mean values, Finding mean values in a spin system, Continuous probability distributions	
3	Gauss and Poisson distributions, magnitude of energy fluctuations, Molecular collisions and the pressure of a gas.	
4	Statistical description of particle systems: Properties of the state of a system, Statistical community, Probability operations, Number of states that can be entered in a macroscopic system.	
5	Distribution functions in statistical physics: Maxwell-Boltzmann statistics, Bose-Einstein statistics, Fermi-Dirac statistics	
6	Thermal interaction: Distribution of energy between macroscopic systems, approach to thermal equilibrium	
7	Temperature interaction: Temperature, Small heat transport, System touching a heat store, Paramagnetism, Average energy of an ideal gas, Average pressure of an ideal gas	
8	Microscopic theory and macroscopic measurements: Determination of absolute temperature, High and low absolute temperatures, Work, Internal energy and heat, Heat capacity, Entropy, Midterm	
9	Canonical distribution in classical approach: Classical approach, Maxwell velocity distribution, Discussion of Maxwell velocity distribution, Co-partition theorem, Applications of the co-partition theorem, The eigenesis of solids	
10	General thermodynamic interaction: Dependence of the number of states on external parameters, general relations valid in equilibrium, Applications to an ideal gas	
11	Basic suggestions of statistical thermodynamics, Equilibrium conditions, Balance between phases, Conversion of randomness to regularity	
12	Simple kinetic theory of transport processes: Average free path, Viscosity and momentum transport, Thermal conductivity and energy transport.	
13	Self-propagation and transport of molecules	
14	Electrical conductivity and charge transport	

22	Textbooks, References and/or Other Materials:	1. Berkeley Physics Lectures Vol 5, F. Reif. Crawford, Jr. Mc Graw Hill Book 1965. 2. Statistical Physics, F. Apaydın, Hacettepe Üniversitesi Müh. Fak. Publications, Publication, Ankara, 2004.
23	Assesment	

TERM LEARNING ACTIVITIES	**NUMBER**	**WEIGHT**
Midterm Exam	1	40.00

Quiz	0	0.00
Home work-project	0	0.00
Final Exam	1	60.00
Total	2	100.00
Contribution of Term (Year) Learning Activities to Success Grade		40.00
Contribution of Final Exam to Success Grade		60.00
Total		100.00
Measurement and Evaluation Techniques Used in the Course		One midterm and one final exam will be held to understand how much the information about this course has been learned.

24 ECTS / WORK LOAD TABLE

Activites	Number	Duration (hour)	Total Work Load (hour)
Theoretical	14	5.00	70.00
Practicals/Labs	0	0.00	0.00
Self study and preperation	14	6.00	84.00
Homeworks	14	5.00	70.00
Projects	0	0.00	0.00
Field Studies	0	0.00	0.00
Midterm exams	1	2.00	2.00
Others	0	0.00	0.00
Final Exams	1	8.00	8.00
Total Work Load			234.00
Total work load/ 30 hr			7.80
ECTS Credit of the Course			8.00

25 CONTRIBUTION OF LEARNING OUTCOMES TO PROGRAMME QUALIFICATIONS

	PQ1	PQ2	PQ3	PQ4	PQ5	PQ6	PQ7	PQ8	PQ9	PQ10	PQ11	PQ12	PQ13	PQ14	PQ15	PQ16
ÖK1	5	5	0	0	5	0	0	0	0	0	0	0	0	0	0	0
ÖK2	5	5	5	5	5	0	0	0	0	0	0	0	0	0	0	0
ÖK3	0	0	0	0	0	5	5	5	0	0	0	0	0	0	0	0
ÖK4	0	0	5	5	5	5	0	0	0	0	0	0	0	0	0	0
ÖK5	0	5	5	0	0	0	0	0	0	0	0	0	0	0	0	0
ÖK6	5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
ÖK7	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
ÖK8	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
ÖK9	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
ÖK10	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

LO: Learning Objectives PQ: Program Qualifications					
Contribution Level:	**1 very low**	**2 low**	**3 Medium**	**4 High**	**5 Very High**