AYDIN ADNAN MENDERES UNIVERSITY
COURSE INFORMATION FORM

Course Title	Statistical Mechanics of Phase Transitions								
Course Code	FZK519		Couse Level	Second Cycle (Master's Degree)					
ECTS Credit	6	Workload	150 *(Hours)*	Theory	3	Practice	0	Laboratory	0
Objectives of the Course	To teach the mechanism of phase transitions, the classification of phase transitions in magnetic systems, statistical mechanics of model systems								
Course Content	Phase concept and phase transformations, thermodynamic principles, models; Ising model, Potts model								
Work Placement									
Planned Learning Activities and Teaching Methods	Explanation (Presentation), Discussion, Individual Study, Problem Solving								
Name of Lecturer(s)									

Assessment Methods and Criteria		
Method	Quantity	Percentage (%)
Midterm Examination	2	20
Final Examination	1	60
Quiz	2	10
Assignment	1	5
Term Assignment	1	5

Recommended or Required Reading	
1	Statistical Mechanics of Phase Transitions, Oxford University Press, J. M. Yeomans
2	Principles of Equilibrium Statistical Mechanics, D. Chowdhury, D. Stauffer, Wiley-VCH
3	Statistical Physics, Berkeley Physics Course
4	İstatistik Mekaniğe Giriş, Bekir Karaoğlu, Seyir Yayıncılık

Week	Weekly Detailed Course Contents	
1	Theoretical	Phase transitions, Microscopic model
2	Theoretical	Critical points
3	Theoretical	Statistical mechanics, Thermodynamics
4	Theoretical	First and second order phase transitions
5	Theoretical	Properties of free energy
6	Theoretical	Critical exponents
7	Theoretical	Models
8	Intermediate Exam	Midterm Exam
9	Theoretical	Spin-1/2 Ising model
10	Theoretical	Lattice-gas model
11	Theoretical	Spin-1 Ising model
12	Theoretical	Potts model
13	Theoretical	Blume-Capel model
14	Theoretical	Heisenberg model
15	Theoretical	Ising-Heisenbergy model
16	Theoretical	Final Exam

Workload Calculation				
Activity	Quantity	Preparation	Duration	Total Workload
Lecture - Theory	14	3	3	84
Assignment	12	0	2	24
Quiz	4	1	1	8
Midterm Examination	1	7	5	12

Final Examination	1	17	5	22
			Total Workload (Hours)	150
			[Total Workload (Hours) / 25*] = **ECTS**	6
**25 hour workload is accepted as 1 ECTS*				

Learning Outcomes	
1	To be able to be dominated by issues of statistical mechanics and thermodynamics
2	To be able to express the phase transformations and their reasons
3	To be able to use statistical mechanics models
4	To be able to identify, formulate, and solve field related problems.
5	To be able to present the information obtained at the end of the research.

Programme Outcomes *(Physics Master)*	
1	The student should conceive the concepts in physics and may apply them on her/his own
2	The student should be able to conceive the relationship between the different physics laws and integrity of them and apply them in solving different physics problems
3	The student should know the basic principles of classical, quantum and relativistic physics and use them in the solutions of problems
4	The student should be able to do research in a specific area of physics
5	The student should be able to prepare reports on papers on the subject of her/his research and present her/his research subject in scientific conferences
6	The student should be able to explain the relationship between complicated problems and basic physics laws.
7	The student should be able to use computers for solving complicated physics problems
8	The student should be able to interrelate between the theory and the experiment. If she/he is experimentalist he/she has to explain the theory behind her/his work. If she /he is a theorist she/he should has to know the experiments in her/his subject.

Contribution of Learning Outcomes to Programme Outcomes *1:Very Low, 2:Low, 3:Medium, 4:High, 5:Very High*

	L1	L2	L3	L4	L5
P1	5	4	4	4	4
P2	5	5	4	4	4
P3	3	3	4	3	3
P4	3	4	5	4	5
P5	3	3	4	3	4
P6	4	4	4	4	4
P7	2	4	5	3	3
P8	2	4	4	4	2