AYDIN ADNAN MENDERES UNIVERSITY
COURSE INFORMATION FORM

Course Title	Special Topics in Statistical Physics						
Course Code	FZK607		Couse Level	Third Cycle (Doctorate Degree)			
ECTS Credit	7	Workload	175 *(Hours)*	Theory	3	Practice	0	Laboratory	0
Objectives of the Course	To learn magnetic phase transitions in systems, classification systems, simulation model .						
Course Content	Spin-1/2 Ising-Heisenberg Models, Star-Triangle, Decoration-Iteration Transformations, Computer Simulations.						
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	1	20
Final Examination	1	37
Quiz	2	10
Attending Lectures	14	28
Assignment	1	5

Recommended or Required Reading

1	R. J. Baxter, Exactly Solved Models in Statistical Mechanics, Academic Press, London, 1982.
2	J. Samuel Smart, Effective Field Theories of Magnetism, W. B. Saunders Company, London, 1966.
3	H. E. Stanley, Introduction to Phase Transitions and Critical Phenomena, Clarendon Press, Oxford, 1971.

Week	Weekly Detailed Course Contents	
1	Theoretical	Classical spin-1/2 Ising model.
2	Theoretical	Phase Transitions in Magnetic Syatems.
3	Theoretical	Classification of Phase Transitions.
4	Theoretical	Star-Triangle Transformation.
5	Theoretical	Decoration-Iteration Transformation.
6	Theoretical	Lattice Spin Models
7	Theoretical	Mean Field Approximation
8	Theoretical	Transfer Matrix Method
9	Theoretical	Spin-1/2 Ising-Heisenberg model.
10	Theoretical	Mixed spin models
11	Theoretical	Computer Simulation Methods
12	Theoretical	Monte-Carlo Simulation
13	Theoretical	Cluster Variation Method
14	Theoretical	Pair Approximation
15	Final Exam	Final Exam

Workload Calculation

Activity	Quantity	Preparation	Duration	Total Workload
Lecture - Theory	14	4	3	98
Assignment	12	2	2	48
Individual Work	4	2	1	12
Quiz	4	1	0.5	6
Midterm Examination	1	2	3	5

Final Examination	1	2	4	6
		Total Workload (Hours)		175
		[Total Workload (Hours) / 25*] = **ECTS**		7

*25 hour workload is accepted as 1 ECTS

Learning Outcomes

1	Be able to express phase transitions
2	Can be classify phase transitions
3	Be able to express Spin-1/2 models
4	To learn computer simulations
5	To have information about the models used in defining statistical systems

Programme Outcomes *(Physics Doctorate)*

1	
2	
3	
4	
5	
6	
7	
8	

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	5	5	5	5
P2	5	5	4	5	4
P3	5	5	5	5	4
P4	2	2	4	4	4
P5	2	2	4	4	3
P6	4	4	3	4	3
P7	3	5	5	5	4
P8	3	3	3	3	3