

AYDIN ADNAN MENDERES UNIVERSITY COURSE INFORMATION FORM

Course Title Condensed Matter Physics II			П						
Course Code	FZK504		Couse Level		Second Cycle (Master's Degree)				
ECTS Credit 6	Workload	149 <i>(Hours)</i>	Theory		3	Practice	0	Laboratory	0
Objectives of the Course To get students informed on electrical, thermal, magnetic and structural properties of conde and get them learn some methods of calculations and related concepts					rties of condensed	d matter			
Course Content	attice vibrations, some thermal properties of condensed matter, optical properties of solids, erroelectricity and structural phase transitions, introduction to magnetic properties, superconductivity, surface science and artificial structures					ctivity,			
Work Placement									
Planned Learning Activities and Teaching Methods		Explana Problem	tion (Pi Solvin	resenta [.] g	tion), Discussio	on, Case Stu	ıdy, Individual Stu	dy,	
Name of Lecturer(s)									

Assessment Methods and Criteria

Method	Quantity	Percentage (%)	
Midterm Examination	1	20	
Final Examination	1	35	
Quiz	2	10	
Attending Lectures	14	28	
Assignment	7	7	

Recommended or Required Reading

- 1 Advanced Solid State Physics, P. Philips
- 2 Principles in condense matter physics, P.M.Chaikin, T.C. Lubensky

Week	Weekly Detailed Course Contents			
1	Theoretical	Semiconductors		
2	Theoretical	Band structure of metals		
3	Theoretical	Band structure of semiconductors and insulators		
4	Theoretical	Electron correlations		
5	Theoretical	Coulomb interactions		
6	Theoretical	Hartree-Fock approximation		
7	Theoretical	Screening, plasmons		
8	Intermediate Exam	Midterm Exam		
9	Theoretical	Density functional theory		
10	Theoretical	pseudopotentials		
11	Theoretical	LCAO tight binding approximation		
12	Theoretical	Quantum hall effect		
13	Theoretical	Electron-phonon interactions		
14	Theoretical	Scattering		
15	Theoretical	Scattering problems		
16	Final Exam	Final Exam		

Workload Calculation				
Activity	Quantity	Preparation	Duration	Total Workload
Lecture - Theory	14	2	3	70
Assignment	7	1.5	1	17.5
Quiz	2	2	1	6
Midterm Examination	1	20	3	23



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Final Examination	1	30	3	33		
Total Workload (Hours)			149			
[Total Workload (Hours) / 25*] = ECTS			6			
*25 hour workload is accepted as 1 ECTS						

Learn	ing Outcomes
1	To be able to explain properties and importance of crystal vibrations
2	To be able to relate phonon concept to quantum mechanics and relate thermal properties with phonon
3	To be able to explain optical properties of solids with relation to light ,phonons and electrons
4	To be able to express magnetic properties of solids related to atomic and structural properties of condensed matter
5	To be able to explain Bose-Einstein condensation and apply to describe superconductivity and other quantum effects in condensed matter

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	3	5	4	
P2	4	4	3	4	4	
P3	4	4	4	3	4	
P4	3	2	2	4	4	
P5	2	2	2	3	2	
P6	4	3	4	5	5	
P7	1	1	2	2	1	
P8	3	2	3	4	4	