AYDIN ADNAN MENDERES UNIVERSITY
COURSE INFORMATION FORM

Course Title	Condensed Matter Physics I								
Course Code	FZK503		Couse Level	Second Cycle (Master's Degree)					
ECTS Credit	6	Workload	150 *(Hours)*	Theory	3	Practice	0	Laboratory	0
Objectives of the Course	To educate and help students acquire abilities to understand structure of condensed matter,structure of cyristal stricter and their related properties,motion of electrons in matter, energy bands in semiconductors and metals, application to electronic devices.								
Course Content	Crystal structures and symmetry of crystals, crystal bonding and its relation to their properties, motion of electrons in matter, Application to electronics								
Work Placement	N/A								
Planned Learning Activities and Teaching Methods	Explanation (Presentation), Discussion, Case Study, Individual Study, Problem Solving								
Name of Lecturer(s)	Assoc. Prof. Yelda KADIOĞLU								

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	Simetry and definition of Crystal Lattices(Summary)
	Preparation Work	Solid State Physics N.E. Ashcroft, N.D.Mermin Ch.4-7
2	Theoretical	Crystal Binding and its properties
	Preparation Work	Solid State Physics N.E. Ashcroft, N.D.Mermin,Ch.19-20
3	Theoretical	X-Ray Diffraction
	Preparation Work	Solid State Physics N.E. Ashcroft, N.D.Mermin,Ch.22-25
4	Theoretical	Crystal Symmetry and its properties
	Preparation Work	Solid State Physics N.E. Ashcroft, N.D.Mermin, Ch.6
5	Theoretical	Ionic bond and its Properties
	Preparation Work	Solid State Physics, G.Burns ch.7
6	Theoretical	Covalent bonding and its properties
	Preparation Work	Solid State Physics, G.Burns ch.8
7	Theoretical	Metallic Binding, Properties of metals,Free electron Drude model
	Preparation Work	Solid State Physics, G.Burns,Ch.8
8	Intermediate Exam	Midterm Exam
9	Theoretical	DC conductivity,Wiedeman-Franz Law, and Frequency related Conductivity
	Preparation Work	Solid State Physics N.E. Ashcroft, N.D.Mermin,Ch.9
10	Theoretical	Quantum Physics of Metals
	Preparation Work	Solid State Physics N.E. Ashcroft, Solid State Physics, G.Burns,Ch.9
11	Theoretical	Band Theory
	Preparation Work	Solid State Physics N.E. Ashcroft, N.D.Mermin,Ch.17
12	Theoretical	Wave functions and energy levels in metals
	Preparation Work	Solid State Physics N.E. Ashcroft, N.D.Mermin,Ch.15
13	Theoretical	Semiconductors, Bands in Semiconductors and related concepts
	Preparation Work	Solid State Physics N.E. Ashcroft, N.D.Mermin,ch.15

14	Theoretical	p-n, metal-semiconductor junctions and its physics
	Preparation Work	Solid State Physics, G.Burns,Ch.10
15	Theoretical	Effective mass, Holes and related concepts
	Preparation Work	Solid State Physics, G.Burns,Ch.10/C
16	Final Exam	Final exam

Workload Calculation

Activity	Quantity	Preparation	Duration	Total Workload
Lecture - Theory	14	4	3	98
Seminar	5	3	2	25
Quiz	2	2	0.5	5
Midterm Examination	1	6	3	9
Final Examination	1	10	3	13
			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 define crystal structures and their general properties.
2	To be abe to relate crystal binding and its properties
3	To be able to explain the relation between quantum physics and energy bands
4	To be able to explain the properties and applications of semiconductors with relating quantum mechanics
5	To be able to explain electronical applications of crystals

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