



Course Weekly Outline

Course Instructor	Dr. Ziad Tariq Khodair				
E_mail	al_tatwer@yahoo.com				
Title	Solid State Physics				
Course Coordinator	Annual				
Course Objective	-Teaching students the basic principles of solid state physics -Teaching students to applications of solid state physics and relation with other sciences.				
Course Description	Introduction in solid state, study of: lattice vibration, thermal properties of solids, free electron gas model, modern free electron gas model, band theory				
Textbook	-Introduction to Solid State Physics, C. Kittel, 7th edition, John Wiley & sons, (1996). -Solid state physics, J.C. Blackmore. 2nd edition, W.B. Saunders Co. (1974)				
References	-Solid state physics, James D. Patterson, 1 st edition, Springer, 2007 -Fundamentals of the Physics of Solids, Jen Solyom, 1st edition, Springer, 2007				
Course Assessment	Term Tests	Laboratory	Quizzes	Project	Final Exam
	35%	10%	5%	-	50%
General Notes	-----				



Course weekly Outline

week	Date	Topics Covered	Lab. Experiment Assignments	Notes
1	3/10/2011	Introduction in solid state physics	Crystals-1	
2	10/10/2011	Lattice vibration and phonons	Crystals-2	
3	17/10/2011	Vibration of monatomic lattice	Crystal structure	
4	24/10/2011	Vibration of diatomic lattice	NaCl crystal	
5	31/10/2011	Thermal properties of solids(introduction)	KCl crystal	
6	7/11/2011	Classical model of lattice energy	Si crystal	
7	14/11/2011	The Einstein's model for specific heat	Thermal conductivity 1	
8	21/11/2011	Debye model for specific heat	Thermal conductivity 2	
9	28/11/2011	Free electron model(introduction)	Bragg's law	
10	5/12/2011	Classical theory of free electrons	Scattering	
11	12/12/2011	Thermal conductivity for electrons	Electron diffraction	
12	19/12/2011	Lorentz theory for free electron conductivity	Neutron diffraction	
13	26/12/2011	Quantum free electron model	Electrical conductivity	
14	2/1/2012	Fermi and Dirac quantum statistics	Energy gap	
15	9/1/2012	Density of state for free electron gas in 1 D.	Hall effect	
16	16/1/2012	Review	Review	
Half-year Break				
17	6/2/2012	Density of state for free electron gas in 3 D	Hall effect	
18	13/2/2012	Energy free electron gas in 3 D	Solar cells 1	
19	20/2/2012	Sommerfeld theory for electrical conductivity	Solar cells 2	
20	27/2/2012	Thermal conductivity to sommerfeld theory	Dielectric constant	
21	5/3/2012	The band theory of solids (introduction)	Crystal defect 1	
22	12/3/2012	Bloch function	Crystal defect 2	
23	19/3/2012	The Kronig-Penney model	Magnetism in metals	
24	26/3/2012	Effective mass of electron	Ferromagnetic in metals	
25	2/4/2012	Semiconductors crystals	Paramagnetic in metals	
26	9/4/2012	Holes, donor state	Diamagnetic in metals	
27	16/4/2012	Acceptor state	Superconductivity	
28	23/4/2012	Superconductivity	Meissner effect	
29	30/4/2012	Magnetic field	Thickness of thin films(1)	
30	7/5/2012	Meissner effect	Thickness of thin films(2)	
31	14/5/2012	Energy gap	Review	

Instructor Signature:

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