

Spr 2015 ECE 4070 MSE 5470 Physics of Semiconductors and Nanostructures

Class #	Dates	Day	Lecture Topics	Reading (Handout)	HW Assigned	HW Due	Comments
1	21-Jan	Wed	Classical: Drude model 1		1		
2	23-Jan	Fri	Classical: Drude model 2		1		
3	26-Jan	Mon	Quantum intro 1	Notes		1	
4	28-Jan	Wed	Quantum intro 2	Notes			
5	30-Jan	Fri	Quantum intro 3		2		
6	2-Feb	Mon	Quantum electron gas 1		3	2	
7	4-Feb	Wed	Quantum electron gas 2		3		
8	6-Feb	Fri	Quantum currents, 2D, 1D	Notes			
9	9-Feb	Mon	Crystals		4		
10	11-Feb	Wed	Reciprocal Lattice		5	3	
11	13-Feb	Fri	Reciprocal Lattice		5		
	16-Feb	Mon	Cornell Feb Break				
12	18-Feb	Wed	DJ @ Wox ( <b>Guest Lecture?</b> )		6		
13	20-Feb	Fri	DJ @ ND ( <b>1st Exam</b> )				
14	23-Feb	Mon	Electrons in Periodic Potential		6		
15	25-Feb	Wed	Electrons in Periodic Potential		7		
16	27-Feb	Fri	Electrons in Periodic Potential		8	4	
17	2-Mar	Mon	DOS, Bands		8		
18	4-Mar	Wed	Metals, Semiconductors, Insulatc		9		
19	6-Mar	Fri	Metals, Semiconductors, Insulatc		9		
20	9-Mar	Mon	Perturbation theory	Notes			
21	11-Mar	Wed	Perturbative bandstructure	Notes			
22	13-Mar	Fri	Perturbative effective mass, etc	Notes		5	
23	16-Mar	Mon	Atomic orbitals		10		
24	18-Mar	Wed	Tight-binding Bandstructure		11		
25	20-Mar	Fri	LCAO		12		
26	23-Mar	Mon	Kronig-Penney/ Green's function	Notes		6	
27	25-Mar	Wed	Kronig-Penney/Green's function	Notes			
28	27-Mar	Fri	Properties & stats of band states	13, 14			
	30-Mar	Mon	Spring break				
	1-Apr	Wed					
	3-Apr	Fri					
29	6-Apr	Mon	Effective mass theory I		24		
30	8-Apr	Wed	Effective mass theory II		24		
31	10-Apr	Fri	Doping		24	7	
32	13-Apr	Mon	Heterostructures	25, 26, 27			
33	15-Apr	Wed	Ballistic Transport/Ballistic FET	15, 28			
34	17-Apr	Fri	Fermi's Golden Rule	Notes!!			
35	20-Apr	Mon	Boltzmann Transport	22,23		8	
36	22-Apr	Wed	Quantum Transport	Notes!!			
37	24-Apr	Fri	Phonons and Photons	17-22, 29-32			
38	27-Apr	Mon	Electron-Photon/Electron Phono	17-22, 29-32		9	
39	29-Apr	Wed	Absorption coefficient, Gain	29-32			<i>Extra Topics (Can do Extra Lectures)</i>
40	1-May	Fri	LEDs, Lasers	29-32			1) Spin/Spin-Orbit Interactions
41	4-May	Mon	Superconductivity - I	Notes!!		10 <<SELECT>>	2) Tunneling Transport in Semiconductors
42	6-May	Wed	Superconductivity - II	Notes!!			3) Berry Phase/Topological aspects/QHE
							4) Non-Equilibrium Green's Function Transport
	18-May	Mon	Final Exam				