

Spring 2025 – PHYSICS 3034 – R.Sonnenfeld

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SCHEDULE – (Rev. B– 02/04/2025)

wk	Date	Class Topic	Reading Asst.	HW Asst.
1	1/22	[1] Geometric Optics Principal Rays	Ch 2-2.6 (Pedrotti)	
	1/24/25	[2] Lensmaker Equation	Ch 2.7–2.11	
2	1/27	[3] Matrix optics	18.1–18.5 (Ped.)	
	1/29	[4] Matrix optics thick lenses	18.6–18.8	
	1/31	[5] Matrix optics		HW01
3	2/3	[5] Overview, Maxwell in Integral and Diff Form	7.3.1–7.3.3 (Griffiths)	
	2/5	[6] B-field energy, Continuity Eqn → Maxwell Disp. Current		
	2/7	[7] Energy Continuity & Poynting's Theorem	8.1.1–8.1.2	HW02
4	2/10	[8] Derive Poynting Th'm, Examples	8.2.1	
	2/12	[9] Mech Waves → Wave Eqn, k ω , Waves in 1D	9.1.1–9.1.2	
	2/14	[10] \vec{k} , Complex arithmetic for waves		HW03
5	2/17	[11] 1-D Reflection & Transmission	Ch. 9.1.3–9.1.4	
	2/19	[12] 1-D Ref.Trans., 3-D Plane Waves	9.2.1–9.2.2	
	2/21	[13] Energy and Momentum of EM Plane Waves	9.2.3	
6	2/24	[11] Poynting vector and intensity of plane waves		
	2/26	[12] Test 1	9.3.1	
	2/28	[12] EM waves boundary conditions	9.3.1	
7	3/3	[13] Reflection and Refraction	9.3.2	
	3/5	[14] Snell's Law	9.3.3.	
	3/7	[15] Polarization and Brewster's Angle		HW04
8	3/10	[17] Derive Wave Eqn in Conductors	9.4.3	
	3/12	[19] Waves in Conductors, B lags E		
	3/14	[20] R & T for Conductors		HW05
*	3/17–21	Spring Break		
9	3/24	[21] Dispersion, Electrons on Springs 9.5.1		
	3/26	[22] Jellium, Derive Cauchy Relation	9.5.2	
	3/28	[23] TBA		HW06
10	3/31	[24] Dispersion, Group & Phase vel.		
	4/2	[25] That's all for waves. Let's start radiation.		
	4/4	[26] Take Home Exam		
11	4/7	[27] Retarded potentials, worked example	10.1.1, 10.1.2	
	4/9	[28] Numerical solutions, Intro to Gauges	10.1.3	
	4/11	NO CLASS	Good Friday	

wk	Date	Class Topic	Reading Asst.	HW Asst.
12	4/14	[29] Coulomb and Lorenz Gauge	10.2.1	
	4/16	[30] Lorenz, Potential of moving point charge		
	4/18	[31] Potentials of moving point charge		Reports
13	4/21	Slack	10.3.1	
	4/23	[32] Jefimenko Eqns / near and far field		
	4/25	[33] Electric dipole radiation	10.3.2	HW07
14	4/28	[34] Electric dipole Radiation	Ch. 11.1.1	
	4/30	[35] Larmor Power Formula	11.1.2 (partial)	HW08
	5/2	[36] Q&A		
15	5/5	[37] Accelerated point charge	11.1.3	
	5/7	[38] Slack	11.1.4	
	5/9	[39] Finals	11.2.1	