PHYS 4392 Tentative Syllabus Spring 2023

Gr refers to the Griffiths text.

Topic	Reading	HW Due
Rapid math review: ∇·, ∇, ∇x operators and Levi-Civita symbol delta functions, key integral theorems.	TEC notes; GR 1.1-1.6	HW1: 22 Jan
Helmholtz thm, Electric field **E**, ∇x**E** and ∇·**E**	Gr 2.1-2.2	HW2: 29 Jan
Electric potential	Gr 2.3	HW3: 5 Feb
Electric potential II, electrostatic work and energy	Gr 2.3-2.4	HW4: 5 Feb
Electrostatic properties of conductors and Laplace's eqn	Gr 2.5, 3.1	HW5: 12 Feb
Method of images	Gr 3.2	HW6: 19 Feb
Separation of variables	Gr 3.3	HW7: 26 Feb
Separation of variables II; The multipole expansion	Gr 3.4	HW8: 26 Feb
Polarization	Gr 4.1-4.2	HW9: 5 March
Electric displacement; boundary conditions with dielectrics	Gr 4.3	HW10: 5 March

Linear dielectrics Dielectrics and capacitors	Gr 4.4 + TEC notes	HW11: 12 March
Test 1 (in class)	Gr CH: 1-3 + TEC notes	
Lorentz force law and Biot-Savart law	Gr 5.1-5.2	HW12: 26 March
Special relativity and the Lorentz force law	TEC notes	HW13: 26 March
Div and curl of **B** (Ampere's law)	Gr 5.3-5.4	HW14: 2 Apr
Ampere's law II, and magnetic vector potential **A**	Gr 5.5	HW15: 2 Apr
Magnetization and **B** from a magnetized object	Gr 6.1-6.2	HW16: 10 Apr
The **H** field	Gr 6.3-6.4	HW17: 10 Apr
Electromotive force and induction	Gr 7.1-7.2	HW18: 16 Apr
Maxwell's equations I	Gr 7.3	HW19: 16 Apr
Test 2 (in class)	Gr Ch.: 4-5; TEC notes	
Maxwell's equations II	Gr 7.3	HW20: 16 Apr
Charge and energy conservation	Gr 8.1	HW21: 23 Apr
Electromagnetism and momentum	Gr 8.2	HW22: 23 Apr

Waves in 1 dimension	Gr 9.1	HW23: 30 Apr
Electromagnetic waves in vacuum	Gr 9.2	HW 24: 30 Apr
No class		
TBD		
TBD		
Final Exam	Cumulative	SMU Final Exam schedule