MODERN PHYSICS SYLLABUS

Reading from Krane	Topics
1.1 and 1.2, p2 – 13	Course overview, classical physics
2.1-2.4 (part), p26-33	Relativistic time
2.4 (part), p 33-35 (to end of Ex. 2.5)	Proper time, proper length, and length contraction.
2.4 (part), p35 – 37	Putting it together: time dilation and length contraction
Handout 1	Simultaneity, synchronization and leading clock lags.
2.4 (part), p 37-40	Velocity addition and Doppler effect
Handout 2	Lorentz transformations
Handout 3	Velocity transformations
2.7 (part), p 47-50	Relativistic momentum and kinetic energy
2.7 (part), 2.8, p 50-56	Total energy and conservation laws, **HW QUIZ (1-8)**
2.9, p56-62	Experimental tests, review
3.1 – 3.2, p 70-80	Waves and the photoelectric effect
3.4-3.5, p 87-94	Photon processes
3.6, 4.1-4.2 (part), p 94-96, 102-107	Photons, DeBroglie waves
	Test 1 (classes 1 - 13)
4.2, 4.7, p 107-110, 126-128	Double slit with particles and probability amplitude
FALL BREAK	
4.3 - 4.4, p 110-119	Uncertainty relations
4.5 (part), p 119-123	Wavepackets
4.5 (part), 4.6, p 123-126	Wavepacket motion
5.1, 5.2, p 134-140	Waves at boundaries, confining particles, **HW QUIZ (9-18)**
5.3, 5.4 (part), p 140-145	The Schrodinger equation and free particles
5.4 (part), p 145-150	Infinite potential well
5.4 (part), p 150-155	Finite potential well and 2D infinite well
5.6, p 158-165	Potential steps and barriers
6.1, 6.4, 6.5 (part), p 170-171, 180-185	Bohr model of hydrogen
6.5 (part), 6.6, 6.7, p 185-192	More Bohr model
8.5, p 240-244	X-rays
12.1-12.5, p 370-382	Intro to nuclear physics, nuclear binding, **HW QUIZ (19-26)**
	Test 2 (classes 14 - 27)
12.6, p 382-387	Radioactive decay
12.7 – 12.9, p 387-395	Types of natural radioactive decay
12.10, p 398-401	Radioactive series and radioactive dating
	THANKSGIVING BREAK
13.1 – 13.3, p 408-416	Nuclear reactions
13.4, p 416-422	Nuclear Fission
13.5, p 422-428	Nuclear fusion
14.1 – 14.3, p 442-452	Forces, particles and conservation laws
14.4 – 14.6, p 453-464	Particle decays, **HW QUIZ (27-35)**
14.7 – 14.8, p 464-473	Quarks and the Standard Model