University Physics - Spring 2011 (subject to announced changes) - Schneider

Week	Chapters/Topics	Topics
01/10-01/14	*Chapter 14:* **Oscillations** (Volume 1 of Tipler)	Simple Harmonic Motion, Energy, Oscillating Systems, Damped/Driven
	Chapter 15: **Wave Motion** (Volume 1 of Tipler)	Waves in 3D (decibles), Doppler Effect
01/17-01/21	*Chapter 15:* **Wave Motion** (continued)	Simple wave motion, Harmonic waves, Barriers (reflection/refraction)
	Chapter 16: **Superposition of Standing Waves** (Vol1)	Superposition of waves, Standing waves, Harmonic Analysis (fft)
Fri 01/21	**Test #1 (Chapters 14-16)**	* Simple Harmonic Motion (position, velocity, energy) * Standing waves (string/sound) * Traveling waves * Doppler effect (source and observer, one/both moving) * Sound waves (beats, decibel scale)
01/24-01/28	*Chapter 30:* **Maxwell's Equation and Electromagnetic Waves**	Electromagnetic Waves (Sec 30.3)
	Chapter 31: **Properties of Light**	Speed of light, Reflection/Refraction, Polarization, Light Spectra, Sources of Light
01/31-02/04	*Chapter 32:* **Optical Images**	Plane and Spherical mirrors, Thin Lenses, Optical Instruments (near/far sighted, microscope, telescope, spyglass)
02/07-02/11	*Chapter 33:* **Interference and Diffraction**	Phase difference and Coherence, Interference in thin films, Two slit interference,
02/14-02/18	*Chapter 33:* **Interference and Diffraction (continued)**	Diffraction of a single slit, Diffraction grating, Phasors (vector kind!)
Fri 02/18	**Test #2 (Chapters 30-33)**	* Polarization (rotated polarizers) * Snell's law (also total internal reflection - can light escape?) * Thin lenses and mirrors (single lens/mirror, calculations, sketches, conceptual questions) * Double lens systems (calculations, conceptual, applications: telescope, microscope, spyglass) * thin film inteference (three cases from class) * Double slit/single slit/diffraction grating (finding location of a certain order, missing order?) * multiple slits - 3 or more (interference pattern, effect of increasing the number of slits)
02/21-02/25	*Chapter 21:* **Electric Field I : Discrete charge distributions**	Electric charge and Conductors/Insulators, Coulomb's Law, Electric Field
02/28-03/04	*Chapter 21 continued*	Electric field lines, Motion of charges in Electric Fields, Electric dipoles in electric fields
	Chapter 22: **Electric Field II : Continuous charge distributions**	Integrating E (finite line, infinite line, ring, disk, plane), Gauss's Law, Calculate E from Gauss's Law (symmetry)
03/07-03/12	*Spring Break - woo hoo!*	
03/14-03/18	*Chapter 23:* **Electric Potential**	Potential difference, potential due to a system of charges, potential of a continuous charge distribution (ring, disk), equipotential surfaces, electrostatic potential energy (some done in capacitors chapter)

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Fri 03/18	**Test #3 (Chapters 21-23)**	* Net Electric field (E vector) / Potential (V scalar) from collection of discrete charges * Electric Field (Ex)/Potential (V) graphs - charges on axis * Electric field (E) recipe equations (point, infinite line, ring) * Charged concentric rings (Gauss rings) * Electric Potential (V) recipe equations (point, rings - fields along axis)
03/21-03/25	*Chapter 25:* **Electric Current and Direct-Current Circuits (*Chap 25 first, then Chap 24*)**	Current and motion of charges, Resistance and Ohm's Law Definition and temp-dependence, Energy in Electric Circuits, Combinations of Resistors, Kirchhoff's Rules voltage multi-loop rules, [Note: The RC portion of Chapter 25 will be done after the Capacitance chapter.]
03/28-04/01	*Chapter 24:* **Electrostatic Energy and Capacitance**	Capacitance (general-parallel plate), Storage of Electrical Energy (definition - p. 757 - eq 24-12), Combination of Capacitors, Dielectrics
04/04-04/08	*Chapter 25:* **Electric Current and Direct-Current Circuits (RC)**	RC Circuits
	Chapter 29: **Alternating-Current Circuits**	AC and a Resistor, AC and Inductors/Capacitors, Phasors (not the Star Trek kind!), LC and RLC - w/o generator, Series RLC w/ generator
04/11-04/15	*Chapter 26:* **The Magnetic Field**	Force exerted by Magnetic Field (RHR#1+2), Motion of point charge in magnetic field, Torques on Current loops and Magnets (RHR#3+4), Hall Effect we get to prove the electrons actually are the charge-carriers!
Fri 04/15	**Test #4 (Chapters 24-26, 29)**	*capacitor/battery circuits - find charges/voltages * resistor/battery circuits - find currents/voltages (also multi-loop circuits) * RC circuits - charge/discharge as a function of time * RLC series AC circuits * Right hand rule problems (force on charges/currents, torques on loops, etc.)
04/18-04/22	*Chapter 27:* **Sources of the Magnetic Field**	Mag field from moving point charge (RHR#1 again), Biot-Savart Law (RHR5+6), Gauss's Law/ Ampere's Law for Magnetism
	Chapter 28: **Magnetic Induction**	Magnetic Flux, Induced EMF and Faraday's law / Lenz's Law
04/25-04/29	*Chapter 28:* **Magnetic Induction (cont.)**	Motional EMF, Eddy Currents, Inductance, Energy in Inductors, RL circuits
	Chapter 27: **Magnetism in Matter**	Magnetism in Matter (Ferromagnetism, hysteresis curve, magnetically soft vs hard materials
	Chapter 29: **Alternating-Current Circuits**	AC Generators, Transformers (the physics kind)
Tues 05/03	**Final Exam - Tues May 3rd - 10:30am-12:30pm - S321**	