Schedule of 8.02 lectures by Walter Lewin in the Spring of 2002.

The **due dates of homework assignments** are indicated. **d1** means assignment 1 is due, **d2** means assignment 2 is due etc.

Lecture Date	Topics Covered	Reading from Giancoli
#1 Wed 2/6	What holds our world together? Electric charges (historical) - Polarization Electric Force - Coulomb's Law	Chapter 21 through Sect. 21-5
#2 Fri 2/8	Electric Field - Field Lines - Superposition Inductive Charging - Dipoles - Induced Dipoles	Sect. 21-6 through 21-11
#3 Mon 2/11	Electric Flux - Gauss's Law - Examples	All of Chapter 22
#4 Wed 2/13	Electrostatic Potential - Electric Energy - eV Conservative Field - Equipotential Surfaces	Chapter 23 through Sect. 23-8
#5 Fri 2/15 **d1**	$\vec{E} = -\mathrm{grad}\, V$ More on Equipotential Surfaces - Conductors Electrostatic shielding (Faraday cage)	Sect. 23-5 & 23-7
#6 Tue 2/19	High-voltage breakdown - Lightning *Sparks - St Elmo's Fire (take notes in lecture)*	Page 591, Page 596 Example 23-5, Page 643 Example 25-9
#7 Wed 2/20	Capacitance - Field energy	Chapter 24 through Sect. 24-4
#8 Fri 2/22 **d2**	Polarization - Dielectrics The Van de Graaff - More on Capacitors	***Lecture Supplement*** Sect. 24-5 & 24-6 & page 1115
#9 Mon 2/25	Currents - Resistivity - Ohm's Law	Chapter 25 through Sect. 25-4
#10 Wed 2/27	Batteries - EMF - Energy Conservation - Power Kirchhoff's Rules - Circuits *Kelvin Water Dropper*	Sect. 25-5 through 25-8 Chapter 26 through Sect. 26-3 *Take Notes*
#11 Fri 3/1 **d3**	Magnetic field - Lorentz force - Torques Electric Motors (DC) Cathode Ray Tube - Oscilloscope	Chapter 27 through Sect. 27-7 ***Hand out Motor kits*** Sect. 23-9
#12 Mon 3/4	Review Exam 1. *(Secret Top!)*	
Wed 3/6	**Exam 1** covering the first 3 assignments, and all material covered in reading assignments and in lectures through Wed 2/27 **(last names A-K in 26-100, L-Z in Walker)**	
#13 Fr 3/8	Moving charges in $\vec{B}$-fields - Cyclotron Synchrotron - Mass Spectrometer Cloud Chamber	Sect. 27-8 & 27-9

#14 Mon 3/11	Biot-Savart law - Gauss' law for magnetic field Revisit the "Leiden Jar" High-voltage power lines	Chapter 28 through Sect. 28-3 Sect. 28-6, 29-6 & 32-2
#15 Wed 3/13	Ampere's law - Solenoids Revisit the *Kelvin Water Dropper* Midterm Evaluation	Sect. 28-4, 28-5 & 28-8 *Take Notes*
#16 Fri 3/15 **d4**	Electromagnetic Induction - Faraday's Law Lenz Law - Complete Breakdown of Intuition Non-Conservative Field	Chapter 29 through Sect. 29-4 Sect. 29-7 & 29-8 ***Lecture Supplement***
#17 Mon 3/18	Motional EMF - Dynamos - Eddy Currents Magnetic Braking	Sect. 29-3, 29-4, 29-5 & 29-8
#18 Wed 3/20	Displacement Current *(Difficult Concept)* Synchronous Motors - Induction Motors Secret Top, how does it work?	Sect. 32-1 Sect. 27-6
#19 Fri 3/22 **d5**	***Vacation Special*** * How do Magicians levitate women? (with demo) * Electric shock treatment (no demo) * Electrocardiogram - Pacemakers * Superconductivity - Levitating Bullet Trains * Aurora Borealis	 Sect. 25-10 Page 606 Sect. 25-9 Page 694 (apod Dec 3, 2001)
#20 Mon 4/1	Inductance - RL Circuits Magnetic Field Energy	Chapter 30 through Sect. 30-4 ***Lecture Supplement (JB)***
Tue 4/2	***Due date of Motor!*** **Testing in 26-110, 1-5 PM**	
#21 Wed 4/3	Magnetic Materials Dia-, Para-, and Ferromagnetism ***Prize Ceremony***	Sect. 28-8, 28-9, 28-10
#22 Fri 4/5 **d6**	Hysteresis - Electromagnets -Bohr Magneton ***Maxwell's Equations***	Sect. 28-8 & 28-9 Sect. 32-3 & 40-7
#23 Mon 4/8	Review Exam 2.	
Wed 4/10	**Exam 2** covering assignments 4, 5 & 6, and all material covered in reading assignments and in lectures through Mon 4/1 **(last names A-K in 26-100, L-Z in Walker)**	
#24 Fri 4/12	Transformers - Car Coils RC Circuits	Sect. 26-4, 26-5 & 29-6
#25 Wed 4/17 **d7**	Driven LRC circuits - Resonance Metal Detectors (beach/airport)	Chapter 31 through Sect. 31-6
#26 Fri 4/19	Traveling Waves - Standing Waves ***Musical Instruments***	Giancoli (Vol. I) Chapter 15 through Sect. 15-9.

#27 Mon 4/22	Resonance - Destructive resonance Electromagnetic Waves - Speed of Light Radio - TV Distance determinations using radar and lasers	Sect. 31-6 Chapter 32 through Sect. 32-9
#28 Wed 4/24 **d8**	Index of Refraction - Poynting Vector Oscillating charges - Radiation Pressure Comet Tails Polarization (linear, elliptical, and circular)	Sect. 32-7 & 32-8 Chapter 33 through Sect. 33-2 Sect. 36-11
#29 Fri 4/26	Snell's law - Refraction - Total Reflection Dispersion - Prisms - Huygen's Principle The Illusion of Color The weird Benham Top - Land's famous demo	Sect. 33-5, 33-6 & 33-7 Chapter 35 through Sect. 35-2
#30 Mon 4/29	Polarizers - Malus's law Brewster angle Polarization by reflection and scattering Why is the sky blue, why are sunsets red? ***the sun will set in 26-100!***	**Handout Optics Kits** Sect. 36-11 & 36-12 *Take Notes*
#31 Wed 5/1 **d9**	***Rainbows*** *(take notes)* ***A modest rainbow will appear in 26-100*** Fog bows - Supernumerary bows Polarization of the bows Halo's around the sun and the moon - mock suns	***Bring a friend, this lecture may also be appreciated by non 8.02 "experts".*** Sect. 33-6
#32 Fri 5/3	Review Exam 3	
Mon 5/6	**Exam 3** covering assignments 7, 8 & 9, and all material covered in reading assignments and in lectures through Fri, 4/26 **(last names A-K in 26-100, L-Z in Walker)**	
#33 Wed 5/8	Double-Slit Interference Interferometers	Sect. 35-3 through Sect. 35-5 Sect. 35-7
#34 Fri 5/10 **d10**	Gratings - Resolving Power Single-slit Diffraction - Angular Resolution Human Eye - Telescopes	Chapter 36 through Sect. 36-8
#35 Mon 5/13	Doppler Effect - The Big Bang - Cosmology Binary Stars - Neutron Stars - **Black Holes**	Sect. 16.7 (Vol. I) & 37-12 *Take Notes!*
#36 Wed 5/15	***Farewell Special***	***Bring a friend, this lecture***