

Today:	Ch 22 & 20 RC & AC Circuits	HW 16 Redo; HW 18
Monday:	Ch 23 AC Circuits	HW 17 Redo; HW 19
Lab:	Lab 6 RC and AC circuits	

Class work: Due at the beginning of class Somewhere in this building, very prominently displayed, is an 'artist's rendition' of some bubble chamber incidents. Assuming that the field is pointing toward you, do a rough sketch and label which are produced by + and which by – charged particles.

22.8 Mutual Inductance and Self-Inductance

- Faraday's Law to Inductance

22.8.1 Mutual Inductance

- Field dependence on Current
- Flux dependence on Current
- Emf dependence on Current
- Moral
- Demo: Mutual Inductance Coils

Example 1 The average Emf induced in a secondary coil is 0.3 V when the current in the primary coil changes from 4 to 2 Amps in 0.1 s. What is the mutual inductance?

22.8.2 Self-Inductance

- Magnitude
- Direction (Lenz's Law Applied)

22.9 Inductance Application: Transformer

Chapter 20 RC & AC Circuits

20.13 RC Circuits

- Capacitor Charging
 - Qualitatively
 - Quantitatively
- Time Constant

Ex 2. An electronic flash attachment for a camera produces a flash by using the energy stored in a 750- μF capacitor. Between flashes, the capacitor recharges through a resistor whose resistance is chosen so the capacitor recharges with a time constant of 3.0 s. Determine the value of the resistance.

- Capacitor Discharging
 - Qualitatively
 - Quantitatively

20.5 Alternating Current with Resistor

- Amplitude and Phase

- Amplitude
- Phase
 - Phase =
- RMS values of V and I
 - $Emf_{\text{rms}} = R I_{\text{rms}}$
 - Average Power Dissipated in AC circuit

Example3: A light bulb is rated for 100 Watts average power dissipation when plugged into a typical U.S. wall socket (rms voltage of 120 V, oscillating at 60 Hz). Write an expression for the current as a function of time.

HW 19

Ch 22

44. The average emf induced in the secondary coil is 0.12 V when the current in the primary coil changes from 3.4 to 1.6 A in 0.14 s. What is the mutual inductance of the coils?

Ch 20

97. In a heart pacemaker, a pulse is delivered to the heart 81 times per minute. The capacitor that controls this pulsing rate discharges through a resistance of $1.8 \times 10^6 \Omega$. One pulse is delivered every time the fully charged capacitor loses 63.2% (i.e. is reduced to 38.6%) of its original charge. What is the capacitance of the capacitor?

36. A light bulb is connected to a 120.0-V wall socket. The current in the bulb depends on the time, t , according to the relation $I = (0.707 \text{ A}) \sin [(314 \text{ Hz}) t]$. (a) What is the frequency, f , of the alternating current? (b) Determine the resistance of the bulb's filament. (c) What is the average power consumed by the light bulb?