Physics 101 Spring 2015
Midterm #3 Topics List

The exam will take place in class on Friday, May 1st. It will be closed book and closed notes. Any equations or constants needed will be provided on the test. You may bring a calculator that is not part of a cell phone. This list of topics is not exhaustive, but should instead serve as a guide to the main points from each chapter. In addition to understanding the concepts and definitions listed, you should also be able to solve problems at the same mathematical level as those found on the homework (the end of some chapters have sections of “plug-and-chug” problems as well as slightly more difficult exercises that you can work for practice).

You will need to bring a Scantron form 882-E (teal green half-sheet) and a #2 pencil. It is highly recommended that you bring extras, and a good eraser. Remember to be on time: if you arrive after late, you will not be allowed any extra time to complete the exam.

Chapters 19-21: Sound

- Properties of Waves
  - Frequency
  - Wavelength
  - Amplitude
  - Period
  - Speed
- Transverse and Longitudinal waves
- Interference and Standing waves
- The Doppler Effect
- Sound waves in air
- Musical sounds
- Pitch
- Intensity vs. Loudness

Chapter 22: Electrostatics

- Charge
- Electric Force & Coulomb’s Law
- Conductors and Insulators
- Charging by contact and induction
- Electric Fields
- Electric Potential Energy and Electric Potential

Chapters 23: Electric Current

- Water pipe analogy for current
- Moving charges
- Current, Voltage, and Resistance
- Ohm’s Law
- AC/DC
- Resistance & Current in series circuits and parallel circuits
Chapter 24: Magnetism

- Magnetic Poles
- Magnetic Field and Force
- Magnetic materials and domains
- Magnetic field of a current-carrying wire
  - Right-hand rule
- Magnetic force between two CCWs
- Magnetic force on moving charged particles
  - Right-hand rule
- Electromagnets

Chapter 25: EM Induction

- Induction: Moving a wire through a magnetic field (or moving a magnetic field near a wire) will induce a current in the wire
- Faraday’s Law
- Transformers: \( \frac{V_1}{N_1} = \frac{V_2}{N_2} \)
- Maxwell’s counterpart to Faraday’s Law
- Self-Induction

Chapter 26: Properties of Light

- EM waves
- Sections of the EM spectrum
  - Gamma Rays
  - X-rays
  - Ultraviolet Light
  - Visible Light
  - Infrared Light
  - Radio/Microwaves
- Transparent Materials
- Opaque Materials
- Sight and Perception

Note: You will not be tested on electric shielding, semiconductors and superconductors, drift velocity, biomagnetism, MHD power, or lens defects.