

## Homework 0, ECEN 3400, Fall 2013

*Due Friday, September 6, in class*

Prof. Zoya Popovic

August 26, 2013

Please look through all the book chapters and orient yourselves in the book by answering the following questions.

1. A coulomb (C) is the unit for electric charge. Can you name anything that has a 1C charge? Please give a reference\*.
2. An ampere (A) is the unit for electric current. How is the ampere defined and when was the unit established? Please give a reference.
3. A volt (V) is the unit for electric voltage and potential. What is the difference between voltage and potential? What is the modern definition of the volt? Please give a reference.
4. An ohm ( $\Omega$ ) is the unit for electric resistance. What is the difference between resistance and resistivity? What does the resistance of a wire depend on?
5. The farad (F) is the unit for capacitance. What is the largest surface mount capacitor that you can buy? Please list manufacturer and attach data sheet.
6. A henry (H) is the unit for inductance. How would you build a 0.1H inductor?
7. A tesla (T) is the unit for magnetic flux density. How large is the magnetic flux density (magnetic field) in a standard clinical MRI machine? Please give a reference.
8. Think about the different parts in your cell phone and charger, and list the parts we will be studying in the class and where they are discussed in your textbook. You will receive credit based on the number of correctly listed items, and the student(s) with the most correct entries will receive double credit on this homework. A table would be a good way to summarize this information.

### Examples:

- Antenna (cell phone as well as wireless port of laptop) – Chapter 24, and 25 (pgs. 483 and 492) (*you can also separate terms, e.g. transmit antenna and receive antenna*)
- Transformer (in power supply) – Chapter X, page Y

\*Note: Wikipedia is usually a good source, but is not peer-reviewed and therefore not accepted as a reference. I have however found it useful as a source of acceptable references (books, refereed articles, etc.)