ELEG240- Spring, 2006
Homework 7
Due 4/19, noon

1. So, this is the diffraction lab. I took data on the first diffracted order, and obtained this result, using a laser with a wavelength of 645 nm:

ϕ_{in}	ϕ_{out}
0	40 degrees
10 degrees	53 degrees
20 degrees	74 degrees

What is the period of the grating? Keep in mind that I am not a perfect measurer. I want all the data used to answer the question.

2. From the book (Eq. 8.A.21), the Fermi energy of a metal is $E_F = \frac{h^2}{8m}(\frac{3N}{\pi})^{2/3}$. Show that this has dimensions of energy.

3. A metal has a Fermi energy of 7 eV and an electron scattering time of 10^{-14} seconds. It is 1 meter long and has a cross section of 1x1 millimeter. What is its resistance?

4. The work function of gold is 4.3 eV. What is the maximum wavelength light that will cause electrons to emit from gold?

5. What is the chemical formula for magnesium fluoride?