ELEG 646; **ELEG 446 - Nanoelectronic Device Principles – Spring 2011**

Homework #1 - due Friday, 18 February 2011, in class

1. Problem 1.1 in chapter 1, p. 45 of Muller, Kamins & Chan (3rd edition).

2. Problem 1.4 (27 ˚C and 500 ˚C only) in chapter 1, p. 45 of Muller, Kamins & Chan (3rd edition) Hints: see Fig. 1.15, and equations in Table 1.4, p. 54, and graph (Fig 2.10), p. 73.

3. Problem 1.7 in chapter 1, p. 46 of Muller, Kamins & Chan (3rd edition). Hint: find the atomic density (cm^{-3}) from Avogadro's number, and then the electron density (cm^{-3}) of Al; compute the mobility from the resistivity, and then the mean scattering time.

4. Problem A1.1 in chapter 1, p. 50 of Muller, Kamins & Chan (3rd edition).

5. By equating $n_i = p_i$, expressed in terms of N_C and N_V, calculate the energy position of the intrinsic Fermi level E_i with respect to E_V, E_g and other parameters.

Homework assignments will appear on the web at:
http://www.ece.udel.edu/~kolodzey/courses/eleg646s11.html

Include your name, due date, assignment number, and course number on each submission.