WEEK ONE ASSIGNMENT

• Read the syllabus.
• Read the "Formal lab report" section of the lab manual.
• Read each of the first 4 experiments (#11-14) and do the problems below.
• After learning which group you are in, carefully read the section of the manual appropriate for your first experiment.

Lab 11: Temperature Dependence of the Electrical Conductivity of Metals

11.1 Plot of $G(x)$ vs $x$ from data in Exp. 11.
11.2 Explain why a 4-wire resistance measurement is used instead of a 2-wire resistance measurement? (You may need to look up the difference before you can answer the question.)

Lab 12: Hall Effect

12.1 Look up the mobilities of holes and electrons in Ge and InAs.


13.1 Look up the band gaps of Si, Ge, GaAs and determine the expected critical wavelengths.
13.2 Download and read the discussion about signals and instrumental response from the course website (SignalsInstr link in website).

Lab 14: X-ray diffraction

14.1 Review a modern physics text to remind yourself how x-rays are created. Write a one-paragraph explanation.
14.2 Using data from tables (good link on course website) look up the lattice spacings of Al and Cr and predict at which angles you expect to find peaks in the x-ray spectrum. (Use the x-ray wavelength appropriate for our experiment.)