MM 2060: Phase Transformations
Assignment 2
Due: 14 February 2021, 11:00 PM

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1. Schematically draw Gibbs free energy of Liquid, FCC and BCC iron from 400 ^{0}C to 1600 ^{0}C.
2. Given internal energy of BCC and FCC iron at room temperature are -0.469 eV and -0.316 eV respectively, and lattice parameter of BCC and FCC iron are, 2.84005 Å and 3.6457 Å, respectively. What is contribution of difference in internal energy of FCC and BCC iron per atom, and difference in PV to Gibbs free energy difference between FCC and BCC at room temperature and pressure?
3. Suppose a ternary alloy containing 40 atomic %A, 30 atomic %B, and rest C solidifies through a ternary eutectic reaction to a mixture of α, β, and γ with the compositions as indicated in the plot below.
    a. What is composition of α, β, and γ, in terms of atomic percentage of A, B and C?[2]
    b. What will be the mole fractions of α, β, and γ in the microstructure? [4]