EGR 221 Materials Science
Fall 2015, Mid-term Exam 2
Study Guide

The exams will be closed book, closed notes.

You should understand the vocabulary terms sufficiently well to answer "fill in the blank" or multiple-choice type questions. In some instances (marked with *) you will need to have a "working knowledge" (i.e. be able to solve related problems).

CH 4
alloy
point defect
vacancy
solid solution
solute
solvent
self-interstitial
substitutional solid solution
interstitial solid solution
grain size*
grain
grain boundary
twin boundary

* these definitions may also require knowing and applying the related equation. For example, you should be able to determine the grain size if given a photomicrograph. For ASTM grain size numbers, the equation will be provided.

Chapter 5
concentration gradient (aka concentration profile)
diffusion
diffusivity
self-diffusion
steady state diffusion

Chapter 6
calculate engineering normal strain, memorize $\{\varepsilon=(l_i-l_o)/l_o\}$*
calculate engineering normal stress, memorize $\{\sigma = F/A_o\}$*
shear stress (define in words)
normal stress (define in words)
hardness test (define or describe)
Hooke's Law to determine modulus of elasticity (memorize $E=\sigma/\varepsilon$)*
modulus of elasticity/Young's modulus
Poisson's ratio, memorize ($\nu = -\varepsilon_t/\varepsilon_a$)*
elastic deformation
plastic deformation
ductility (describe with words as well as equations, %EL, %RA)
toughness
tensile strength/ultimate tensile strength
yield strength/yield point/yield stress

ALSO:
Be able to "read" a stress-strain diagram to determine the ductility (%EL), Young's modulus, yield strength, and tensile strength

* these definitions may also require knowing and applying the related equation.

Note, points may be deducted if units and significant figures are not properly utilized, or if problem solving format is not clear.