Take Home Exam02C1: Yield Stress in Engineering Materials

Assigned: Sunday 02/20/2022

Due (as pdf by email) 02/23/2022 (within three working days)

You may submit your answers in one of two ways:

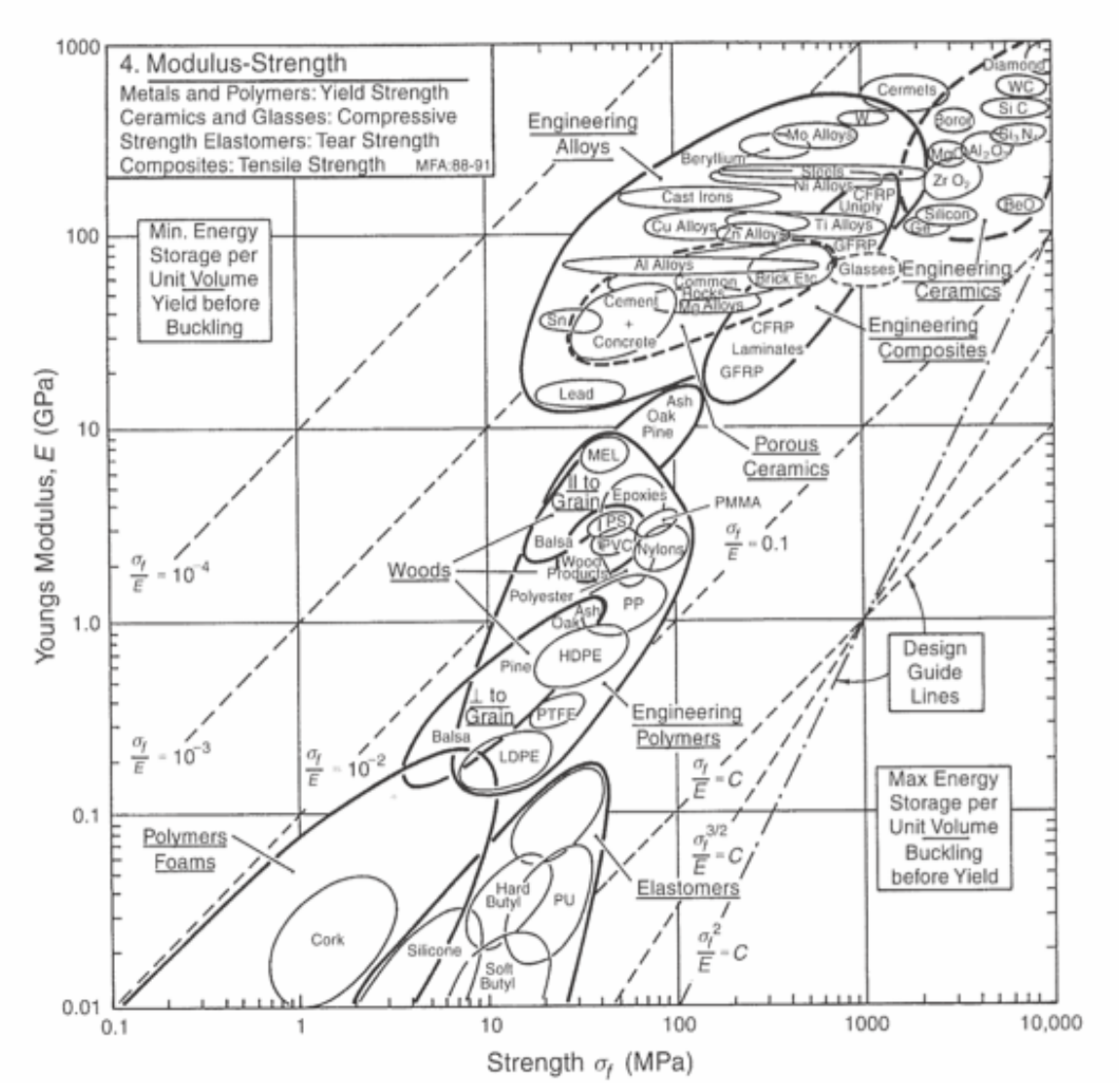
(i)

•For typed answers: as a .docx file (as is) or converted into a pdf file. (DO NOT SEND GOOGLE DOC)

•For handwritten answers: Please scan as images, and group together into one pdf file. Or you may hand them manually to my office (ECME-212)

(ii) Please send your submission via email starting with HWExam02C in the subject line.

HW 02C1.1



Compare the average value of σ_Y / E for ceramics vs. metals. What is the ratio of this number for these two types of materials?

HW 02C2.1

Please take a note of the dispersion of values for different classes of materials, that is, the spread of the ellipse enclosing the numbers for different materials in a given class.

Why is it that the ellipse is much broader for metals than it is for graphite fiber reinforced polymer composites.

HW 02C3.1

It was argued that the dislocation is characterized by a slip vector, $\vec{b}$ and a line vector, $\vec{\ell}$. While the line vector can meander into a curved configuration, the slip vector has a unique value for a dislocation. Why?

Why is $\vec{b}$ is lattice translation vector?