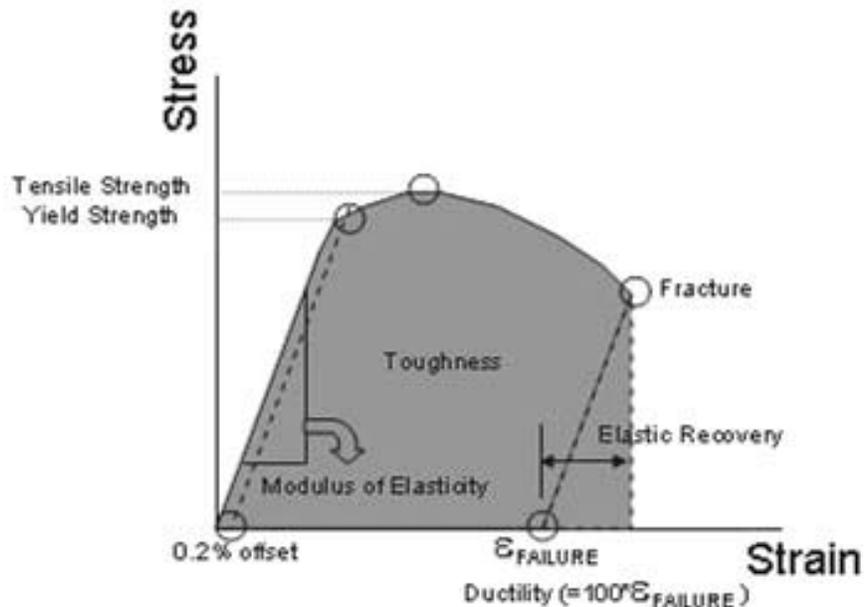


22.14, Problem Set 4, Oral Exam

You have 15 minutes to read the question, and answer it to the best of your ability. You may ask questions of clarification at any time.

Examine the stress strain diagram below, and answer the following questions:



© Sang Kyu kwak and James C Dinunzio. All rights reserved. This content is excluded from our Creative Commons license. For more information, see <http://ocw.mit.edu/help/faq-fair-use/>.

<http://www.etomica.org/app/modules/sites/MaterialFracture/Background1.html>

- 1) Is this the true stress/strain curve, or the engineering stress/strain curve? How do you know?
- 2) Draw the corresponding stress/strain curve from (1) not shown in the diagram. Of the following quantities, which, if any, should be conserved between the two diagrams, and why? There may be more than one quantity conserved.
 1. Yield strength
 2. Modulus of elasticity
 3. Ductility
 4. Toughness
 5. Tensile strength
- 3) Assume that a large neutron flux produces a large amount of point defects, dislocations, and voids. How will the curve above change, and why? Draw the new curve to help explain.
- 4) Explain the process of work hardening in terms of dislocations, whereby a material gets more difficult to deform as you increase its strain.

Name: _____

Grade: _____

MIT OpenCourseWare
<http://ocw.mit.edu>

22.14 Materials in Nuclear Engineering
Spring 2015

For information about citing these materials or our Terms of Use, visit: <http://ocw.mit.edu/terms>.