1. Examine the handout materials. Compare and contrast their mechanical properties (one easy way is to rank each from high to low). What is the most important mechanical property of each. Choose one of these materials and provide a more in-depth discussion of its other properties including, but not limited to - safety, environmental, cost.

2. Determine the composition and quantity of all phases of an equilibrium cooled iron – carbon (2.60 wt %C) alloy (with minor amounts of silicon and manganese, but do not worry about them in terms of the phase diagram). Sketch the resulting microstructure. What is the name of this material? What are the typical uses of such an alloy?

3. Recall problem 14.6 (or 14.7 in the 6th edition) from your homework. A calibration error was made in the determination of the degree of polymerization such that the actual value was 3.9% less than stated. How would you revise your identification of the polymer? Could this material be used as a pressure container to hold oxygen? Assume that the interior pressure is 220 kPa, the exterior oxygen pressure is 21 kPa, and that it must retain a pressure of at least 200 kPa for 5 days to be considered adequate. Make whatever other assumptions you need to check the feasibility of this application.

4. A 3-point bending test is performed on a 10 mm diameter rod of Silicon Carbide. The distance between the supports is one foot. If the load at fracture was 10,000N, what is the flexural strength of the rod? How much bending (deflection) did the rod undergo just before failure?
Presentations: 5 points each (30 points total)

A. Name the three conformations for a carbon nanotube.

B. Name the materials and process used to make a shape memory material:

C. When was platinum discovered?

D. What is the name of the material that the metal chromium is refined from?

E. How is glass tempered?

F. List five plastic and / or composites that were discussed in the presentations