

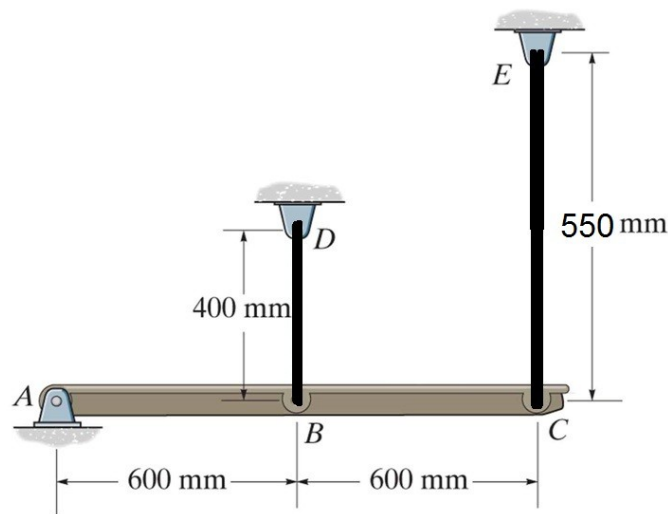
**CE 203 STRUCTURAL MECHANICS I**

First Semester 2012 / 2013 (121)

**HOMEWORK NO. 6**

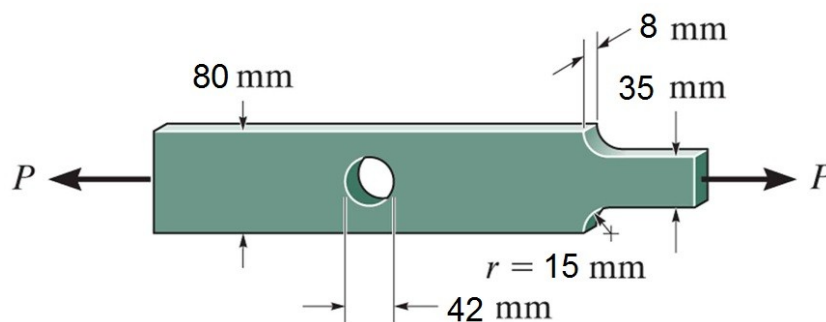
- **Textbook Sections Covered:** 4.6, 4.7, 10.6, Axial Rods , Stress Concentration & Generalized Hooke's Law
- **DUE DATE:** Monday, 15 October 2012

1- The rigid beam AC is supported by a pin at A and the thin rods BD and CE. The 2 rods are made of 6061-T6 aluminum alloy , and each has a radius of 12 mm. Determine the stress in each rod, if the temperature of both rods is increased from 30° C to 100° C. ( Ignore all self-weight)



2- Solve problem 4.91 in the textbook (page 169 ) using the given revised data: **the larger width is 50mm (instead of 37.5) and the smaller width is 30mm (instead of 25)**

3- For the given bar, determine : a) average stress near the left end, b) average stress near the right end, c) maximum stress near the hole , d) maximum stress near the fillet , e) maximum stress in the whole bar.



4- Solve problem 10.57 in the textbook (page 519 ) using the given data:  $E = 2 \text{ GPa}$  and  $\nu = 0.3$  . In addition, calculate the dilatation (volumetric strain).

5- The given solid cube is subjected to the shown forces. Each side was initially 100 mm long. Determine the final dimensions of the block after the application of the loads. Also, calculate the dilatation and the change of volume for the block. ( $E = 10 \text{ GPa}$  ,  $\nu = 0.3$ )

