

CE 203 STRUCTURAL MECHANICS I

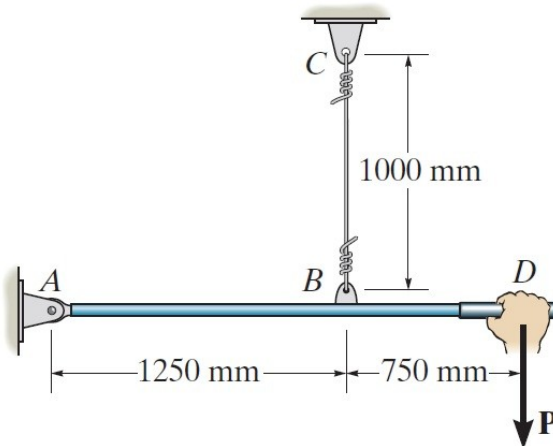
First Semester 2012 / 2013 (121)

HOMEWORK NO. 4

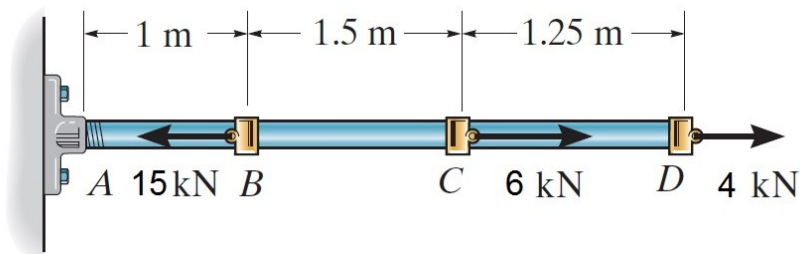
- **Textbook Sections Covered: 4.1 - 4.4 , Axial Rods**
- **DUE DATE: Monday 1st October 2012**

1- Solve problem 4.8 in the textbook using the given revised data: For cables AH & BC , $E = 100 \text{ GPa}$, and cross sectional area is 40 mm^2 . For cables DE & CF , $E = 150 \text{ GPa}$, and cross sectional area is 50 mm^2 .

2- The rigid bar AD is supported using cable BC , which has a radius of 3 mm. If the allowable stress in the cable is 80 MPa , and point D is not allowed to move down more than 4mm, determine the largest load P that can be applied. ($E = 100 \text{ GPa}$)



3- The given rod has a constant diameter $d = 10 \text{ mm}$. Segments AB & CD are made of A36 steel , and segment BC is made of C83400 red brass. Determine the following quantities : a) total change of length for AD , b) relative displacement of D with respect to B , b) relative displacement of D with respect to A.



4- The two rods are made of the same material and are connected as shown. If the cross-sectional area of BC is 100 mm^2 and that of CD is 250 mm^2 , determine the stress in each rod when a force $P = 5 \text{ kN}$ is applied at the junction C . Also, determine the displacement of point C . ($E = 100 \text{ GPa}$)

