

**2.092/2.093**  
**COMPUTER METHODS IN DYNAMICS**  
**FALL 2006**

**Homework 1**

Instructor: Prof. K. J. Bathe  
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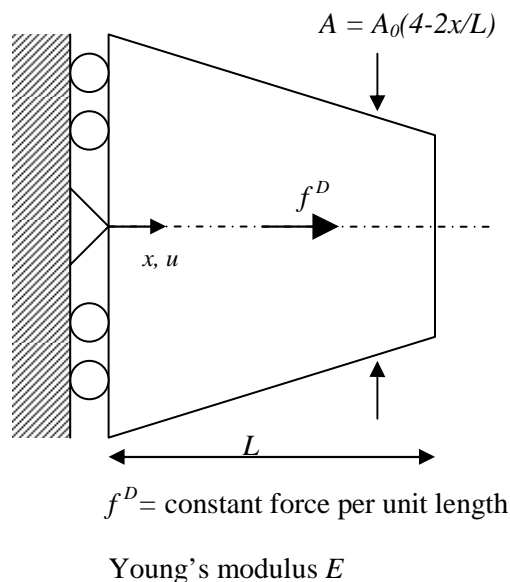
Assigned: Thurs., Sept 14  
Due: Thurs., Sept 21

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**Problem 1 (20 points):**

Consider the bar shown.

- Solve for the exact displacement response of the structure.
- Show explicitly that the principle of virtual work is satisfied with the displacement patterns (i)  $\bar{u} = ax$  (ii)  $\bar{u} = ax^2$ .
- Identify a stress  $\tau_{xx}$  for which the principle of virtual work is satisfied with pattern (ii) but not with pattern (i).



**Reading assignment of textbook:** Chapter 1, Sections 3.3.4, 4.1 and 4.2 (study in particular Examples 4.1, 4.2, 4.3 and 4.4)