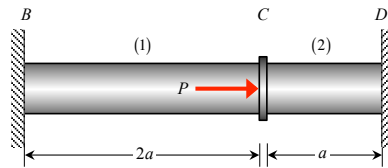


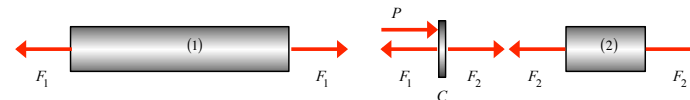
# Lecture 7 summary: axial deformation - indeterminate



The “**four-step plan**” for indeterminate structures (to be used throughout the course):

1. **EQUILIBRIUM**: FBDs and equilibrium equations

$$(1) \quad C: \sum F_x = F_2 + P - F_1 = 0$$



2. **LOAD/DEFORMATION**: Recall sign conventions defined in lecture book

$$(2) \quad e_1 = \frac{F_1 L_1}{E_1 A_1}$$

$$(3) \quad e_2 = \frac{F_2 L_2}{E_2 A_2}$$

3. **COMPATIBILITY\***: Enforce the fixed displacement BCs at B and D:

$$(4) \quad u_D = e_1 + e_2 = 0$$

4. **SOLVE**: Solve equations (1)-(4) for the internal loads  $F_1$  and  $F_2$ .

\* The *compatibility* step is unique for each problem. Put a focused effort in this step. Be mindful of sign conventions.