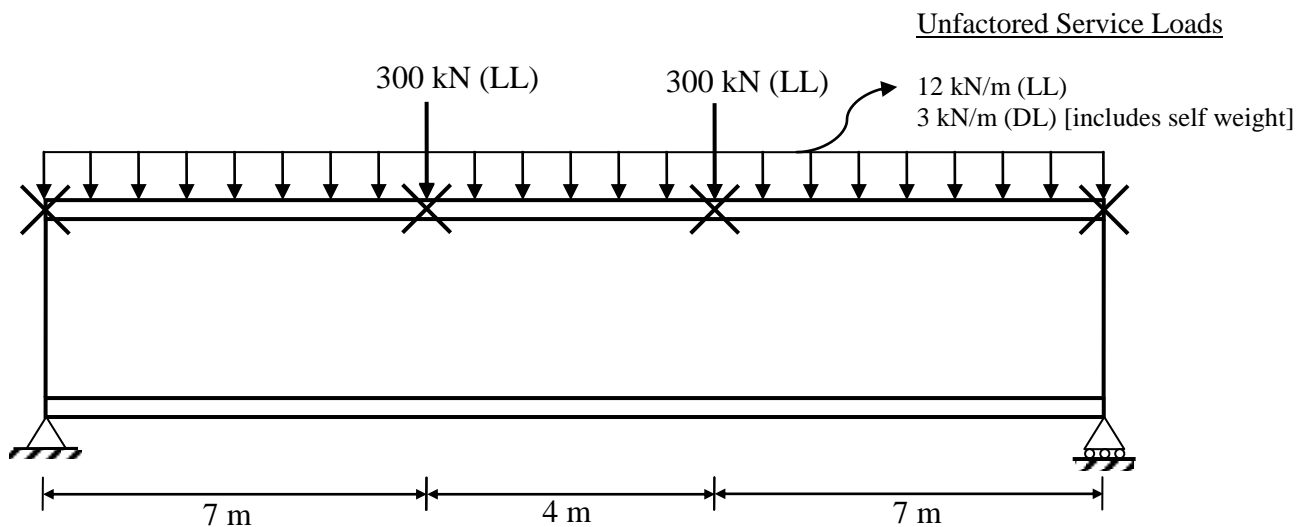


**DESIGN OF STEEL STRUCTURES**  
**2019 – 2020 Fall Semester**

**Homework No: 4 – Date Due: 02.12.2019**

- 1) Design an efficient girder for the two cases explained below. Beam has lateral supports at the ends and at concentrated load locations. Use S235 Steel. ( $F_y=235$  MPa) Show your weld design. ( $F_{EXX}=360$  MPa)



Given loads are service loads. Use 1.2D+1.6L load combination. USE LRFD.

**Case a)** Design an unstiffened girder with a compact web.

**Case b)** Design an unstiffened girder with a noncompact web.

- Service live load deflection  $\Delta_{LL}$  should be less than  $L/360$ .
- Indicate the total weight of the designed girder.
- Show your final calculations clearly.