1 Solids 1D examples

The governing equations are:

1. Conservation of linear momentum

$$\frac{d\sigma_{xx}}{dx} + \rho g x = 0 \tag{1}$$

2. Constitutive Equation for Linear Elastic Isotropic Material

$$\sigma_{xx} = E\epsilon_{xx} \tag{2}$$

3. Kinematics

$$\epsilon_{xx} = \frac{\partial u_x}{\partial x} \tag{3}$$

1.1 Bar with axial force