

Steifigkeitsmatrix des Stabes im 3-Dim.

$$[k] =$$

$$\begin{bmatrix} \frac{\partial^4}{\partial x^4} & \frac{\partial^3}{\partial x^3} & \frac{\partial^2}{\partial x^2} & \frac{\partial}{\partial x} \\ \frac{\partial^3}{\partial x^3} & \frac{\partial^2}{\partial x^2} & \frac{\partial}{\partial x} & 1 \\ \frac{\partial^2}{\partial x^2} & \frac{\partial}{\partial x} & 1 & 0 \\ \frac{\partial}{\partial x} & 1 & 0 & 0 \end{bmatrix}$$

$$\begin{bmatrix} + \frac{EA}{2} & - \frac{EA}{6} \\ - \frac{EA}{6} & + \frac{EA}{3} \end{bmatrix} \cdot \begin{bmatrix} \frac{\partial^4}{\partial x^4} & \frac{\partial^3}{\partial x^3} & \frac{\partial^2}{\partial x^2} & \frac{\partial}{\partial x} \\ \frac{\partial^3}{\partial x^3} & \frac{\partial^2}{\partial x^2} & \frac{\partial}{\partial x} & 1 \\ \frac{\partial^2}{\partial x^2} & \frac{\partial}{\partial x} & 1 & 0 \\ \frac{\partial}{\partial x} & 1 & 0 & 0 \end{bmatrix}$$

$$[k] = \frac{EA}{2}$$

$$\begin{bmatrix} \frac{\partial^4}{\partial x^4} & \frac{\partial^3}{\partial x^3} & \frac{\partial^2}{\partial x^2} & \frac{\partial}{\partial x} \\ \frac{\partial^3}{\partial x^3} & \frac{\partial^2}{\partial x^2} & \frac{\partial}{\partial x} & 1 \\ \frac{\partial^2}{\partial x^2} & \frac{\partial}{\partial x} & 1 & 0 \\ \frac{\partial}{\partial x} & 1 & 0 & 0 \end{bmatrix}$$