Symbols

A	Cross-sectional area
A_v	Shear area
A_{vy}, A_{vz}	Shear area associated with shear force in the y- and z-direction, respectively
$\mathbf{C}$	Constitutive matrix, which relates stresses and strains
C_w	Cross-sectional constant for warping torsion
$\mathbf{D}$	Constitutive matrix in Voight notation, which relates stresses and strains
E	Young's modulus, i.e., modulus of elasticitiy
$\mathbf{F}$	Load vector
G	Shear modulus, $G=E/(2(1+\nu))$
I	Moment of inertia
I_y, I_z	Moment of inertia about the y and z-axes, respectively
i_y, i_z	Radius of gyration about the y and z-axes: $i_y = \sqrt{I_y/A}$, $i_z = \sqrt{I_z/A}$
J	Cross-sectional constant for St. Venant torsion
$\mathbf{K}$, $\mathbf{k}$	Stiffness matrix
L	Member length
M	Bending moment
M_{ij}	Bending moments in the theory for plates and shells. When $i=j$ then the moment acts on the surface with normal vector identified by the index, and is interpreted similar to a bending moment in beam theory. When $i\neq j$ then it is a twisting moment acting on the surface identified by the first index.
m_x, m_y, m_z	Distributed moment (torque) per unit length, around the x, y, and z-axes, respectively
M_x, M_y, M_z	Bending moments in beam theory, about the x, y, and z-axes, respectively. Note that torque is denoted, interchangeably, M_x and T
N	Axial force
P	Externally applied load
q	General symbol for force intensity per unit length. A subscript identifies the direction of the load. Without subscript it is distributed load basic beam theory. In that case the load is downwards, while q_z acts upwards

	because the z-axis runs upwards.
q_s	Shear flow. The subscript can be interpreted as an abbreviation for "shear" or as a reference to the *s*-axis, which runs along the centerline of the cross-section.
q_x, q_y, q_z	Externally applied distributed loads on a structural member in the *x*, *y*, and *z* direction, respectively
$\mathbf{q}$	Vector of generalized coordinates in finite element and energy methods
Q	First moment of area
$\mathbf{Q}$	Vector of generalized forces in finite element and energy methods
T	Torque, same as M_x
$\mathbf{u}$	Displacement vector, containing nodal displacements in all the considered directions
$\tilde{\mathbf{u}}$	Displacement vector containing continuous displacements *u*, *v*, and perhaps *w*. When necessary to avoid confusion, the tilde distinguishes this vector of continuous displacement fields from the vector of nodal degrees of freedom, **u**.
u, v, w	Displacement in the *x*, *y*, and *z* direction, respectively (they are identified by a tilde when it is possible to confuse them with degrees of freedom)
V	Shear force
V_x, V_y, V_z	Shear force in the *x*, *y*, and *z* direction, respectively, in beam theory
V_{ij}	Shear force in the theory for plates and shells
x, y, z	Axis directions. For 1D structural elements, *y* and *z* are the cross-section axes, *z* being the vertical axis in the local element configuration. For 2D elements, the z-axis is the out-of-plane direction.
γ	Shear strain
γ_{xy}, γ_{xz}, γ_{yz}	Engineering shear strains, $\gamma_{ij}= 2\varepsilon_{ij}$
δ	Coefficient of variation or identification of a virtual quantity
ε_{xx}, ε_{yy}, ε_{zz}	Axial strains
ε_{xy}, ε_{xz}, ε_{yz}	Coordinate shear strains ($\gamma_{ij}= 2\varepsilon_{ij}$)
λ	Occurrence rate or Lagrange multiplier
θ_x, θ_y, θ_z	Rotation around the *x*, *y*, and *z*-axis, respectively ($\theta_x=\phi$)
σ	Axial stress
σ_{ij}	Combined notation for shear stress and axial stress components. The type of stress depends on the indices. The first index indicates the surface on which the stress is acting and the second gives its direction. Thus, equal indices, such as σ_{xx}, means axial stress, while different indices, such as

	σ_{xz}, means shear stress (σ_{ij}=τ_{ij}).
σ_{xx}, σ_{yy}, σ_{zz}	Axial stresses
τ	Shear stress
τ_{xy}, τ_{yz}, τ_{xz}	Shear stresses, where the first index indicates the surface on which the stress is acting and the second index gives its direction
φ	Stress function
ϕ	Rotation around the x-axis, i.e., torsion (θ_x=ϕ)
ω	Frequency of vibration