Mechanics of Materials

University Mechanical Engineering · Vocabulary in context

Word	Example
mechanics of materials	Use **mechanics of materials** to estimate stress and deformation.
normal stress	For uniform **normal stress**, divide axial force by section area.
strain /streɪn/	**Strain** is the extension divided by the original length.
Poisson's ratio	**Poisson's ratio** is minus lateral strain divided by axial strain.
torsion /ˈtɔːʃn/	**Torsion** loads a member about its axis.
angle of twist	The **angle of twist** accumulates along the shaft.
flexure formula	Use the **flexure formula** to find bending stress in this beam.
transverse shear	A beam's **transverse shear** stress depends on its cross-section.
Mohr's circle	Use **Mohr's circle** to find stresses on an inclined plane.
principal stress	**Principal stress**es act on planes of zero shear.
deflection /dɪˈflekʃn/	**Deflection** is the beam displacement under load.
elastic curve	The **elastic curve** shows the beam's deflected shape.
buckling	A slender column may bend sideways through **buckling**.

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↘ **eccentric loading**	**Eccentric loading** applies a force away from the section's centroid.
polar moment of area	A larger **polar moment of area** makes a shaft twist less under the same torque.
radius of gyration	The **radius of gyration** k gives the moment of inertia as $I = mk^2$.

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