This study introduces a MATLAB-based learning tool to enhance engineering students’ understanding of stress and shear forces in cantilever cylindrical beams. Utilizing graphical methods, including Mohr’s Circle, the tool allows users to input beam parameters, triggering calculations for axial stress, bending moment, and shear stress. While successful, potential enhancements such as unit flexibility and support for different beam types are identified, offering valuable insights for further development.

Mohr’s Circle is a graphical representation used to analyze and visualize stress components acting on a material at different orientations. It aids engineers in understanding normal and shear stresses and is valuable for identifying principal stresses and maximum shear stresses. By providing a clear visual representation, Mohr’s Circle enhances the interpretation of complex stress states and assists in making informed decisions in structural analysis and design.

Stress and shear are fundamental mechanical concepts representing internal forces within structural elements. Stresses are perpendicular to the face of the stress element we are observing while shear stresses are parallel to the face of the stress element.


I would like to thank Professor Xiaoping for his lectures and teaching me the material, along with Professor Sirikumara for her help through our progress of the project.

Mohr’s Circle

Stress & Shear MATLAB Learning Tool

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