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Design for Deflection: Calculating Deflections in Slender Member Using Strain Energy Methods (Paperback)

By Carl F Zorowski

Createspace Independent Publishing Platform, 2017. Paperback. Condition: New. Language: English . Brand New Book ***** Print on Demand *****. Monograph VI of the Mechanical Design Engineering Series deals with the development and application of strain energy methods to determine the deflection of slender members subjected to bending, torsion and extension (or compression) loadings. Chapter 1 compares the use of classical mechanics techniques to strain energy methods of calculating deflection to illustrate the ease and convenience of using one over the other. Chapter 2 develops how the work done by simple normal and shear stresses along with their respective strains contributes to the strain energy stored in a deformed body. Hooke s Law relationships for an elastic material are introduced to eliminate shear strains and a state of plane strain is introduced for including slender member loading modes. In Chapter 3 the normal and shear stresses are replaced by the bending moments, torques and tensions in slender members that create the internal stresses. Castigliano s theorem is introduced as a means to determine the deflections and slopes that exist at applied moments, torques and axial tension or compression. Chapter 4 presents a number p special example applications of Castigliano s theorem:...



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