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Altri autori (Persone)	GambelinJacques
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Nota di contenuto	Modeling and Dimensioning of Structures; Table of Contents; Preface; Part 1. Level 1; Chapter 1. The Basics of Linear Elastic Behavior; 1.1. Cohesion forces; 1.2. The notion of stress; 1.2.1. Definition; 1.2.2. Graphical representation; 1.2.3. Normal and shear stresses; 1.3. Hooke's law derived from a uniaxially applied force; 1.3.1. The stretch test; 1.3.2. Linear mechanical behavior; 1.3.3. Elastic mechanical behavior; 1.3.4. Interpretation of the test at a macroscopic level; 1.3.5. Interpretation of the test at a mesoscopic level; 1.3.6. Interpretation of the test at a microscopic level 1.5.2.3. Shear resultant Tz1.5.2.4. Torsion moment Mt; 1.5.2.5. Bending moment Mfy; 1.5.2.6. Bending moment Mfz; Chapter 2. Mechanical Behavior of Structures: An Energy Approach; 2.1. Work and

energy; 2.1.1. Elementary work developed by a force; 2.1.2. Elementary work developed by a moment; 2.2. Conversion of work into energy; 2.2.1. Potential energy of deformation; 2.2.2. Potential energy for a spring; 2.3. Some standard expressions for potential deformation energy; 2.3.1. Deformation energies in a straight beam; 2.3.1.1. Traction (or compression); 2.3.1.2. Torsion
2.3.1.3. Pure bending (xy plane)2.3.1.4. Plane bending (xy plane); 2.3.2. Deformation energy under plane stresses; 2.3.2.1. Case 1: dFx (Figure 2.17); 2.3.2.2. Case 2: dFx then dFy (Figure 2.18); 2.3.2.3. Case 3: dFx then dFy followed by dFxy (Figure 2.19); 2.3.2.4. Different expressions for potential energy: quadratic forms; 2.4. Work produced by external forces on a structure; 2.4.1. Beam under plane bending subjected to two forces; 2.4.1.1. Example 1; 2.4.1.2. Example 2; 2.4.2. Beam in plane bending subject to "n" forces; 2.4.3. Generalization to any structure
2.4.3.1. Structure loaded by two forces 1 F and F22.4.3.2. Structure loaded by "n" forces F1,... Fn; 2.4.3.3. A search for real displacements on a loaded structure; 2.4.4. Summary; 2.5. Links of a structure with its surroundings; 2.5.1. Example; 2.5.2. Generalization; 2.5.2.1. Structures with rigid-body movements; 2.5.2.2. "Properly linked" structure; 2.6. Stiffness of a structure; 2.6.1. Preliminary note; 2.6.2. Stiffness matrix; 2.6.3. Examples; 2.6.3.1. Example: beam under plane bending loaded by two forces; 2.6.3.2. Example: beam under plane bending loaded by a force and a moment
2.6.3.3. Generalization

Sommario/riassunto

This book provides the main topics currently used for the calculus of structures. The reference establishes a link between the traditional approach on the strength of materials and the present finite element method, details the main aspects of practical modeling, and explores numerous case studies.