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Matrix; 2.2.2 Rod Mass Element; 2.3 The Eigenvalue Equation; 2.4 Beam Element; 2.4.1 Beam Element Stiffness Matrix
 2.4.2 Beam Element Mass Matrix 2.5 Beam with an Axial Force; 2.6 Beam on an Elastic Foundation; 2.7 General Remarks on the Discretisation Process; 2.8 Alternative Derivation of Element Stiffness; 2.9 Two-dimensional Elements: Plane Stress; 2.10 Energy Approach and Plane Strain; 2.10.1 Thermoelasticity; 2.11 Plane Element Mass Matrix; 2.12 Axisymmetric Stress and Strain; 2.13 Three-dimensional Stress and Strain; 2.14 Plate Bending Element; 2.15 Summary of Element Equations for Solids; 2.16 Flow of Fluids: Navier-Stokes Equations; 2.17 Simplified Flow Equations; 2.17.1 Steady State 2.17.2 Transient State 2.17.3 Convection; 2.18 Further Coupled Equations: Biot Consolidation; 2.19 Conclusions; References; Chapter 3 Programming Finite Element Computations; 3.1 Introduction; 3.2 Local Coordinates for Quadrilateral Elements; 3.2.1 Numerical Integration for Quadrilaterals; 3.2.2 Analytical Integration for Quadrilaterals; 3.3 Local Coordinates for Triangular Elements; 3.3.1 Numerical Integration for Triangles; 3.3.2 Analytical Integration for Triangles; 3.4 Multi-Element Assemblies; 3.5 'Element-by-Element' Techniques; 3.5.1 Conjugate Gradient Method for Linear Equation Systems 3.5.2 Preconditioning 3.5.3 Unsymmetric Systems; 3.5.4 Symmetric Non-Positive Definite Equations; 3.5.5 Eigenvalue Systems; 3.6 Incorporation of Boundary Conditions; 3.6.1 Convection Boundary Conditions; 3.7 Programming using Building Blocks; 3.7.1 Black Box Routines; 3.7.2 Special Purpose Routines; 3.7.3 Plane Elastic Analysis using Quadrilateral Elements; 3.7.4 Plane Elastic Analysis using Triangular Elements; 3.7.5 Axisymmetric Strain of Elastic Solids; 3.7.6 Plane Steady Laminar Fluid Flow; 3.7.7 Mass Matrix Formation; 3.7.8 Higher-Order 2D Elements; 3.7.9 Three-Dimensional Elements 3.7.10 Assembly of Elements

Sommario/riassunto

"Provides an updated version of Fortran 2003 (all the Fortran programs and subroutines are listed in full in the text but will also be made available online)"--
