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	Nota di contenuto	Cover; Contents; 1 Historical introduction; 2 Weighted residual and variational methods; 2.1 Classification of differential operators; 2.2 Self-adjoint positive definite operators; 2.3 Weighted residual methods; 2.4 Extremum formulation: homogeneous boundary conditions; 2.5 Non-homogeneous boundary conditions; 2.6 Partial differential equations: natural boundary conditions; 2.7 The Rayleigh-Ritz method; 2.8 The 'elastic analogy' for Poisson's equation; 2.9 Variational methods for time-dependent problems; 2.10 Exercises and solutions; 3 The finite element method for elliptic problems 3.1 Difficulties associated with the application of weighted residual methods3.2 Piecewise application of the Galerkin method; 3.3 Terminology; 3.4 Finite element idealization; 3.5 Illustrative problem involving one independent variable; 3.6 Finite element equations for Poisson's equation; 3.7 A rectangular element for Poisson's equation; 3.8 A triangular element for Poisson's equation; 3.9 Exercises and solutions; 4 Higher-order elements: the isoparametric concept; 4.1 A two-point boundary-value problem; 4.2 Higher-order rectangular elements; 4.3 Higher-order triangular elements 4.4 Two degrees of freedom at each node4.5 Condensation of internal

| Sommario/riassunto | The finite element method is a technique for solving problems in applied science and engineering. The essence of this book is the application of the finite element method to the solution of boundary and initial-value problems posed in terms of partial differential equations. The method is developed for the solution of Poisson's equation, in a weighted-residual context, and then proceeds to time-dependent and nonlinear problems. The relationship with the variational approach is alsoexplained. This book is written at an introductory level, developing all the necessary concepts where required. Co |