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Livello bibliografico	Monografia
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Nota di bibliografia	Includes bibliographical references and index.
Nota di contenuto	Finite Elements: Computational Engineering Sciences; Contents; Preface; About the Author; Notations; 1 The Computational Engineering Sciences: an introduction; 1.1 Engineering Simulation; 1.2 A Problem-Solving Environment; 1.3 Weak Formulation Essence; 1.4 Decisions on Forming WSN; 1.5 Discrete WSh Implementations; 1.6 Chapter Summary; References; 2 Problem Statements: in the engineering sciences; 2.1 Engineering Simulation; 2.2 Continuum Mechanics Viewpoint; 2.3 Continuum Conservation Principle Forms; 2.4 Constitutive Closure for Conservation Principle PDEs 2.5 Engineering Science Continuum MechanicsReferences; 3 Some Introductory Material: PDEs, BCs, solutions, discrete concepts; 3.1 Example Linear Heat Conduction Solutions; 3.2 Multidimensional PDEs, Separation of Variables; 3.3 Mathematical Foundation Essence for GWSN; 3.4 A Legacy FD Construction; 3.5 An FD Approximate Solution; 3.6 Lagrange Interpolation Polynomials; 3.7 Chapter Summary; Exercises; References; 4 Heat Conduction: an FE weak statement tutorial; 4.1 A Steady Heat Conduction Example; 4.2 Weak Form

Approximation, Error Extremization

5.6 Global Theory, Asymptotic Error Estimate5.7 Nonsmooth Data,

Theory Generalization; 5.8 Temperature-Dependent Conductivity,

Nonlinearity; 5.9 Static Condensation, p-Elements; 5.10 Chapter

Summary; Exercises; Computer Labs; References; 6 Engineering

Sciences, $n = 1$: GWSH $\{N_k()\}$ implementations in the computational

engineering sciences; 6.1 Introduction; 6.2 The Euler-Bernoulli Beam

Equation; 6.3 Euler-Bernoulli Beam Theory GWSH Reformulation; 6.4

Timoshenko Beam Theory; 6.5 Mechanical Vibrations of a Beam; 6.6

Fluid Mechanics, Potential Flow; 6.7 Electromagnetic Plane Wave

Propagation

6.8 Convection-Radiation Finned Cylinder Heat Transfer6.9 Chapter

Summary; Exercises; Computer Labs; References; 7 Steady Heat

Transfer, $n > 1$: $n = 2, 3$ GWSH for D E+ BCs, FE bases, convergence,

error mechanisms; 7.1 Introduction; 7.2 Multidimensional FE Bases and

DOF; 7.3 Multidimensional FE Operations for $\{N_k()\}$; 7.4 The $N_k =$

1,2 Basis FE Matrix Library; 7.5 NC Basis $\{W_S\}$ e Template, Accuracy,

Convergence; 7.6 The Tensor Product Basis Element Family; 7.7 Gauss

Numerical Quadrature, $k = 1$ TP Basis Library; 7.8 Convection-Radiation

BC GWSH Implementation

7.9 Linear Basis GWSH Template Unification

Sommario/riassunto

Approaches computational engineering sciences from the perspective of engineering applications Uniting theory with hands-on computer practice, this book gives readers a firm appreciation of the error mechanisms and control that underlie discrete approximation implementations in the engineering sciences. Key features: Illustrative examples include heat conduction, structural mechanics, mechanical vibrations, heat transfer with convection and radiation, fluid mechanics and heat and mass transportTakes a cross-discipline continuum mechanics viewpoi

2. Record Nr.	UNISA996417493403316
Titolo	North Carolina Central law journal
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