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Titolo	Introduction to Nonlinear Thermomechanics of Solids / / by Micha Kleiber, Piotr Kowalczyk
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Disciplina	531.3
Soggetti	Mechanics, Applied Solids Mechanics Mathematical physics Mechanical engineering Computer-aided engineering Mathematics - Data processing Solid Mechanics Classical Mechanics Theoretical, Mathematical and Computational Physics Mechanical Engineering Computer-Aided Engineering (CAD, CAE) and Design Computational Science and Engineering
Lingua di pubblicazione	Inglese
Formato	Materiale a stampa
Livello bibliografico	Monografia
Note generali	Includes Index.
Nota di contenuto	1. Introduction -- 1.1. General remarks on the book content -- 1.2. Nonlinear continuum thermomechanics as a field of research and its industrial applications -- 2. Fundamental concepts of mechanics -- 2.1. Statics of a bar -- 2.2. Trusses -- 2.3. Two-dimensional continuum generalization -- 3. Fundamentals of tensor algebra and analysis -- 3.1. Introduction -- 3.1.1. Euclidean space and coordinate systems -- 3.1.2. Scalars and vectors -- 3.1.3. Basis of vector space -- 3.2. Tensors -- 3.2.1. Definitions -- 3.2.2. Operations on tensors --

3.2.3. Isotropic tensors -- 3.3. Second order tensors -- 3.3.1. Definitions and properties -- 3.3.2. Tensor eigenproblem -- 3.3.3. Spectral decomposition of symmetric tensor -- 3.3.4. Polar decomposition of tensor -- 3.4. Tensor functions and fields -- 3.4.1. Integration and differentiation of tensor fields -- 3.4.2. Gauss–Ostrogradski theorem -- 3.5. Curvilinear coordinate systems -- 3.6. Notations used in tensor description -- 4. Motion, deformation and strain in material continuum -- 4.1. Motion of bodies -- 4.2. Strain -- 4.2.1. Definitions -- 4.2.2. Physical meaning of strain in one dimension -- 4.2.3. Physical meaning of strain components -- 4.2.4. Some other strain tensor properties -- 4.3. Area and volumetric deformation -- 4.4. Strain rate and strain increments -- 4.4.1. Time derivative of a tensor field. Lagrangian and Eulerian description of motion -- 4.4.2. Increments and rates of strain tensor measures -- 4.4.3. Strain increments and rates in one dimension -- 4.5. Strain compatibility equations -- 5. Description of stress state -- 5.1. Introduction -- 5.1.1. Forces, stress vectors and stress tensor in continuum -- 5.1.2. Principal stress directions. Extreme stress values -- 5.2. Description of stress in deformable body -- 5.2.1. Cauchy and Piola–Kirchhoff stress tensors -- 5.2.2. Objectivity and invariance of stress measures -- 5.3. Increments and rates of stress tensors -- 5.4. Work of internal forces. Conjugate stress–strain pairs -- 6. Conservation laws in continuum mechanics -- 6.1. Mass conservation law -- 6.2. Momentum conservation law -- 6.3. Angular momentum conservation law -- 6.4. Mechanical energy conservation law -- 7. Constitutive equations -- 7.1. Introductory remarks -- 7.2. Elastic materials -- 7.2.1. Linear elasticity -- 7.2.2. Nonlinear elasticity -- 7.3. Viscoelastic materials -- 7.3.1. One-dimensional models -- 7.3.2. Continuum formulation -- 7.3.3. Energy dissipation in viscoelastic materials -- 7.4. Elastoplastic materials -- 7.4.1. One-dimensional models -- 7.4.2. Three-dimensional formulation in plastic flow theory -- 8. Fundamental system of solid mechanics equations -- 8.1. Field equations and initial-boundary conditions -- 8.2. Incremental form of equations -- 8.3. Some special cases -- 8.4. Example of analytical solution -- 9. Fundamentals of thermomechanics and heat conduction problem -- 9.1. Laws of thermodynamics -- 9.1.1. The first law of thermodynamics -- 9.1.2. The second law of thermodynamics -- 9.2. Heat conduction problem -- 9.3. Fundamental system of solid thermomechanics equations. Thermomechanical Couplings -- 9.4. Thermal expansion in constitutive equations of linear elasticity -- 10. Variational formulations in solid thermomechanics -- 10.1. Variational principles — introduction -- 10.2. Variational formulations for linear mechanics problems -- 10.2.1. Virtual work principle and potential energy -- 10.2.2. Extended variational formulations -- 10.3. Variational formulations for nonlinear mechanics problems -- 10.3.1. Elasticity at large deformations -- 10.3.2. Incremental problem of nonlinear mechanics -- 10.4. Variational formulations for heat conduction problems -- 11. Discrete formulations in thermomechanics -- 11.1. Discrete formulations in heat conduction problems -- 11.1.1. Linear problem of stationary heat conduction -- 11.1.2. General form of the heat conduction problem -- 11.2. Discrete formulations in solid mechanics problems -- 11.2.1. Linear problem of statics -- 11.2.2. Linear problem of dynamics -- 11.2.3. Nonlinear elastic problem with large deformations -- 11.2.4. Incremental form of nonlinear mechanics problem -- 11.3. Weighted residual method -- 12. Fundamentals of finite element method -- 12.1. Introduction -- 12.1.1. FEM formulation for linear heat conduction problem -- 12.1.2. FEM formulation for linear static elasticity problem -- 12.2. FEM approximation at the

element level -- 12.2.1. Simple one-dimensional elements -- 12.2.2. Constant strain elements -- 12.2.3. Isoparametric elements -- 13. Solution of FEM equation systems -- 13.1. Introduction -- 13.2. Solution methods for linear algebraic equation systems -- 13.2.1. Elimination methods -- 13.2.2. Iterative methods -- 13.3. Multigrid methods -- 13.4. Solution methods for nonlinear algebraic equation systems -- 13.5. Solution methods for linear and nonlinear systems of first order ordinary differential equations -- 13.6. Solution methods for linear and nonlinear systems of second order ordinary differential equations -- Bibliography -- Index. .

Sommario/riassunto

The first part of this textbook presents the mathematical background needed to precisely describe the basic problem of continuum thermomechanics. The book then concentrates on developing governing equations for the problem dealing in turn with the kinematics of material continuum, description of the state of stress, discussion of the fundamental conservation laws of underlying physics, formulation of initial-boundary value problems and presenting weak (variational) formulations. In the final part the crucial issue of developing techniques for solving specific problems of thermomechanics is addressed. To this aim the authors present a discretized formulation of the governing equations, discuss the fundamentals of the finite element method and develop some basic algorithms for solving algebraic and ordinary differential equations typical of problems on hand. Theoretical derivations are followed by carefully prepared computational exercises and solutions.

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Autore	Friedman Edward S
Titolo	Handbook of Depression : Second Edition / / by Edward S Friedman, Ian M Anderson
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ISBN	1-907673-79-2
Edizione	[1st ed. 2014.]
Descrizione fisica	1 online resource (112 p.)
Disciplina	615.78
Soggetti	Psychiatry Psychopharmacology Psychotherapy
Lingua di pubblicazione	Inglese
Formato	Materiale a stampa
Livello bibliografico	Monografia
Note generali	Description based upon print version of record.
Nota di bibliografia	Includes bibliographical references at the end of each chapters.
Nota di contenuto	Chapter 1 Classification, causes and epidemiology -- Chapter 2 Depression in different types of patients -- Chapter 3 Disgnosis -- Chapter 4 Principles of therapy -- Chapter 5 Medications -- Chapter 6 Other treatments -- Chapter 7 Management of treatment nonresponse -- Chapter 8 Continuation and maintenance treatment. .
Sommario/riassunto	Depression is a common mood disorder that affects approximately 10% of the global population at some point in their lives and can cause serious psychological, physical, and cognitive distress. Additionally, patients with depression are at a greater risk for cardiovascular disease, stroke, functional impairment, disability and all-cause mortality. Aside from the impact on the individual, this condition presents a very real economic burden, as depression is the most predominant mental health problem among working-age patients and the leading cause of lost work productivity. Despite advances in screening and treating depression in recent decades, a vast majority of patients with depression do not actively seek treatment and, of those that do, only a quarter have been found to receive adequate and effective interventions. Handbook of Depression, Second Edition is a concise review of assessment tools, available and emerging pharmacological and non-pharmacological treatment options, and consensus management guidelines that center on enhancing the

clinician-patient relationship and improving patient quality of life. Cowritten by expert US- and UK-based authors, this handbook has an innovative global focus that consolidates current knowledge in a convenient, pocket-sized guide that is ideal for every day reference in a clinical setting.