Elasticity Plasticity The Structur 2nd Edition

Second-Order Effect in Elasticity, Plasticity and Fluid Dynamics
THEORY OF ELASTICITY AND PLASTICITY
Elasticity, Plasticity and Structure of Matter
Physical Basis of Plasticity in Solids
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Elasticity, Plasticity and Structure of Matter ... With a chapter on the plasticity of crystals by Dr. W. G. Burgers ... Second edition. [Translated by H. E. Teves-Acly.].
Elasticity, Plasticity and Structure of Matter ... with a Chapter on the Plasticity of Crystals by Dr. W.G. Burgers. [Translated by H.E. Teves-Acly.].
Foundations of the Theory of Elasticity, Plasticity, and Viscoelasticity
Deformation Theory of Plasticity
Plasticity
Fundamentals of the Theory of Plasticity
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Second-Order Effects in Elasticity, Plasticity and Fluid Dynamics
Mechanics Of Solids And Structures (2nd Edition)
Engineering Plasticity

BLAZE COCHRAN

Second-Order Effect in Elasticity, Plasticity and Fluid Dynamics
Springer Science & Business Media
Engineering Plasticity deals with certain features of the theory of plasticity that can be applied to engineering design. Topics covered range from specification of an ideal plastic material to the behavior of structures made of idealized elastic-plastic material, theorems of plastic theory, and rotating discs, along with torsion, indentation problems, and slip-line fields. This book consists of 12 chapters and begins by providing an engineering background for the theory of plasticity, with emphasis on the use of metals in structural engineering; the nature of physical theories; and the conceptual simplicity and power of plastic theory. The next chapter explains how to set up a model of the plastic behavior of metal for use in analysis and design of structures and forming processes, paying particular attention to the plastic deformation that occurs when a specimen of metal is stressed. Subsequent chapters focus on the behavior of a simple structure made of elastic-plastic material; theorems of plastic theory; rotating discs; and indentation problems. Torsion, slip-line fields, and circular plates under transverse loading are also discussed, together with wire-drawing and extrusion and the effects of changes in geometry on structure. This monograph is written primarily for engineering students.
THEORY OF ELASTICITY AND PLASTICITY World Scientific
Theory of Elasticity and Plasticity is designed as a textbook for both undergraduate and postgraduate students of engineering in civil, mechanical and aeronautical disciplines. This book has been written with the objective of bringing the concepts of elasticity and plasticity to the students in a simplified and comprehensive manner. The basic concepts, definitions, theory as well as practical applications are discussed in a clear, logical and concise manner for better understanding. Starting with, general relationships between stress, strain and deformations, the book deals with specific problems on plane stress, plane strain and

torsion in non-circular sections. Advanced topics such as membrane analogy, beams on elastic foundations and plastic analysis of pressure vessels are also discussed elaborately. For better comprehension, the text is well supported with: Large number of worked-out examples in each chapter. Well-labelled illustrations. Numerous Review Questions that reinforce the understanding of the subject. As all the concepts are covered extensively with a blend of theory and practice, this book will be a useful resource to the students.

Elasticity, Plasticity and Structure of Matter Springer Science & Business Media

This book focuses on the plastic property of materials, and the way in which structures made of such material behave under load. It is intended for civil, mechanical, electro-mechanical, marine, and aeronautical engineers for under-graduate or post-graduate courses or research, and professionals in industry. Professor Calladine, from long experience in teaching, research and industry, here delivers a readable and authoritative account of theory and applications. He presents the classical "perfect plasticity material" as a model of irreversible mechanical behaviour, using this perfect plasticity property to analyse a range of continuum structural problems and metal-forming processes relevant to engineering practice.

Physical Basis of Plasticity in Solids Springer Science & Business Media

The fifteen chapters of this book are arranged in a logical progression. The text begins with the more fundamental material on stress and strain transformations with elasticity theory for plane and axially symmetric bodies, followed by a full treatment of the theories of bending and torsion. Coverage of moment distribution, shear flow, struts and energy methods precede a chapter on finite elements. Thereafter, the book presents yield and strength criteria, plasticity, collapse, creep, visco-elasticity, fatigue and fracture mechanics. Appended is material on the properties of areas, matrices and stress concentrations. Each topic is illustrated by worked examples and supported by numerous exercises drawn from the author's teaching experience and professional institution examinations (CEI).This edition includes new material and an extended exercise section for each of the fifteen chapters, as well as three appendices. The broad text ensures its suitability for undergraduate and postgraduate courses in which the mechanics of solids and structures form a part including: mechanical, aeronautical, civil, design and materials engineering.

Plasticity for Engineers Springer Science & Business Media

The essential aim of this book is to consider a wide set of problems arising in the mathematical modeling of mechanical systems under unilateral constraints. In these investigations elastic and non-elastic deformations, friction and adhesion phenomena are taken into account. All the necessary mathematical tools are given: local boundary value problem formulations, construction of variational equations and inequalities and their transition to minimization problems, existence and uniqueness theorems, and variational transformations (Friedrichs and Young-Fenchel-Moreau) to dual and saddle-point search problems.

Plasticity and Beyond Springer Science & Business Media

Plasticity is concerned with the mechanics of materials deformed beyond their elastic limit. A strong knowledge of plasticity is essential for engineers dealing with a wide range of engineering problems, such as those encountered in the forming of metals, the design of pressure vessels, the mechanics of impact, civil and structural engineering, as well as the understanding of fatigue and the economical design of structures. Theory of Plasticity is the most comprehensive reference on the subject as well as the most up to date -- no other significant Plasticity reference has been published recently, making this of great interest to academics and professionals. This new edition presents extensive new material on the use of computational methods, plus coverage of important developments in cyclic plasticity and soil plasticity. A complete plasticity reference for graduate students, researchers and practicing engineers; no other book offers such an up to date or comprehensive reference on this key continuum mechanics subject Updates with new material on computational analysis and applications, new end of chapter exercises Plasticity is a key subject in all mechanical engineering disciplines, as well as in manufacturing engineering and civil engineering. Chakrabarty is one of the subject's leading figures.

Variational and Quasi-Variational Inequalities in Mechanics Elsevier

Intended for use by advanced engineering students and professionals, this volume focuses on plastic deformation of metals at normal temperatures, as applied to strength of machines and structures. 1971 edition.

Elasticity CRC Press

The subject of Elasticity can be approached from several points of view, depending on whether the practitioner is principally interested in the mathematicalstructure of the subject or in its use in engineering applications and in the latter case, whether essentially numerical or analytical methods are envisaged as the solution method. My first introduction to the subject was in response to a need for information about a specific problem in Tribology. As a practising engineer with a background only in elementary Strength of Materials, I approached that problem initially using the con cepts of concentrated forces and superposition. Today, with a rather more extensive knowledge of analytical techniques in Elasticity, I still find it helpful to go back to these roots in the elementary theory and think through a problem physically as well as mathematically, whenever some new and unexpected feature presents difficulties in research. This way of thinking will be found to permeate this book. My engineering background will also reveal itself in a tendency to work examples through to final expressions for stresses and displacements, rather than leave the derivation at a point where the remaining manipulations would be routine. With the practical engineering reader in mind, I have endeavoured to keep to a minimum any dependence on previous knowledge of Solid Mechanics, Continuum Mechanics or Mathematics.

Elasticity, plasticity and structure of matter CRC Press

Dams and Appurtenant Hydraulic Structures, now in its second edition, provides a comprehensive and complete overview of all kinds of dams and appurtenant hydraulic structures throughout the world.The reader is guided through different aspects of dams and appurtenant hydraulic structures in 35 chapters, which are subdivided in five themes:I. Dams an

Applied Mechanics Reviews Courier Corporation

This careful and detailed introduction to non-linear continuum mechanics and to elasticity and platicity, with a unique mathematical foundation, starts right from the basics. The general theory of mechanical behaviour is particularized for the broad and important classes of elasticity and plasticity. Brings the reader to the forefront of today's knowledge. A list of notations and an index help the reader finding specific topics.

Plasticity in Structural Engineering Fundamentals and Applications Bull Ridge Corporation

Computational Methods in Elasticity and Plasticity: Solids and Porous Media presents the latest developments in the area of elastic and elasto-plastic finite element modeling of solids, porous media and pressure-dependent materials and structures. The book covers the following topics in depth: the mathematical

foundations of solid mechanics, the finite element method for solids and porous media, the theory of plasticity and the finite element implementation of elasto-plastic constitutive models. The book also includes: -A detailed coverage of elasticity for isotropic and anisotropic solids. -A detailed treatment of nonlinear iterative methods that could be used for nonlinear elastic and elasto-plastic analyses. -A detailed treatment of a kinematic hardening von Mises model that could be used to simulate cyclic behavior of solids. -Discussion of recent advances in the analysis of porous media and pressure-dependent materials in more detail than other books currently available. Computational Methods in Elasticity and Plasticity: Solids and Porous Media also contains problem sets, worked examples and a solutions manual for instructors.

Second-order Effects in Elasticity Plasticity and Fluid Dynamics Elsevier

The book presents the latest findings in experimental plasticity, crystal plasticity, phase transitions, advanced mathematical modeling of finite plasticity and multi-scale modeling. The associated algorithmic treatment is mainly based on finite element formulations for standard (local approach) as well as for non-standard (non-local approach) continua and for pure macroscopic as well as for directly coupled two-scale boundary value problems. Applications in the area of material design/processing are covered, ranging from grain boundary effects in polycrystals and phase transitions to deep-drawing of multiphase steels by directly taking into account random microstructures.

Elasticity, Plasticity, and Structure of Matter Elsevier

This book introduces the physical mechanism of the plastic deformation of solids, which relies essentially on the occurrence and motion of dislocations. These are linear defects, specific of crystalline solids whose motion under external stresses explains the relative ease by which solids (metals in particular) can be deformed in order to give them desired shapes. The objective is to introduce the topic to undergraduate students, restricting to the main ideas and showing their relevance in interpreting phenomena well known to everyone (e.g. why are certain metals harder than others?), and finally training the students in the practice of calculating the simplest properties of dislocations.

Elasticity PHI Learning Pvt. Ltd.

Foundations of the Theory of Elasticity, Plasticity, and Viscoelasticity details fundamental and practical skills and approaches for carrying out research in the field of modern problems in the mechanics of deformed solids, which involves the theories of elasticity, plasticity, and viscoelasticity. The book includes all modern methods of research a

Dams and Appurtenant Hydraulic Structures, 2nd edition World Scientific

Plasticity documents the proceedings of the Second Symposium on Naval Structural Mechanics held at Brown University, Rhode Island, 5-7 April 1960. It was sponsored jointly by the Office of Naval Research of the U.S. Navy and Brown University. The symposium was devoted to plasticity. The intention was to provide critical reviews of recent developments in certain areas of plasticity of particular current interest and importance, and to supplement these with short accounts of related current research work. The papers presented at the symposium covered the following areas: atomic theory of plastic flow and fracture; stress-strain relations including thermoplasticity and creep; basic theory including stability and uniqueness; boundary value problems including plates and shells; dynamic loading and plastic waves; and developments in design. Two talks were also held for the purpose of reviewing the present status of application of plasticity in design of naval vessels. The symposium was opened by Captain J. C. Myers on behalf of the Office of Naval Research and by Professor W. Prager on behalf of Brown University. Professor Prager closed the symposium by presenting a brief resume of the main accomplishments and trends in plasticity brought to light during the symposium.

Elasticity and Plasticity of Large Deformations Springer Science & Business Media

This volume comprises two classic essays on the mathematical theories of elasticity and plasticity by authorities in this area of engineering science. Undergraduate and graduate students in engineering as well as professional engineers will find these works excellent texts and references. The Mathematical Theory of Elasticity covers plane stress and plane strain in the isotropic medium, holes and fillets of assignable shapes, approximate conformal mapping, reinforcement of holes, mixed boundary value problems, the third fundamental problem in two dimensions, eigensolutions for plane and axisymmetric states, anisotropic elasticity, thermal stress, elastic waves induced by thermal shock, three-dimensional contact problems, wave propagation, traveling loads and sources of disturbance, diffraction, and pulse propagation. The Mathematical Theory of Plasticity explores the theory of perfectly plastic solids, the theory of strain-hardening plastic solids, piecewise linear plasticity, minimum principles of plasticity, bending of a circular plate, and other problems.

Elasticity and Plasticity of the Elements of Structures and Machines Springer

This book examines the issues across the breadth of elasticity theory. Firstly, the underpinning mathematics of vectors and matrices is covered. Thereafter, the equivalence between the inidicial, symbolic and matrix notations used for tensors is illustrated in the preparation for specific types of material behaviour to be expressed, usually as a response function from which a constitutive stress-strain relation follow.Mechanics of Elastic Solids shows that the elastic response of solid materials has many forms. Metals and their alloys confirm dutifully to Hooke's law. Non-metals do not when the law connecting stress to strain is expressed in polynomial, exponential and various empirical, material specific forms. Hyper- and hypo- elasticity theories differ in that the former is restricted to its thermodynamic basis while the latter pervades many an observed response with its release from thermal restriction, but only at the risk of contravening the laws of thermodynamics.This unique compendium is suitable for a degree or diploma course in engineering and applied mathematics, as well as postgraduate and professional researchers.

Elasticity and Plasticity World Scientific Publishing Company

This book was written to serve as the standard textbook of elastoplasticity for students, engineers and researchers in the field of applied mechanics. The present second edition is improved thoroughly from the first edition by selecting the standard theories from various formulations and models, which are required to study the essentials of elastoplasticity steadily and effectively and will remain universally in the history of elastoplasticity. It opens with an explanation of vector-tensor analysis and continuum mechanics as a foundation to study elastoplasticity theory, extending over various strain and stress tensors and their rates. Subsequently, constitutive equations of elastoplastic and viscoplastic deformations for monotonic, cyclic and non-proportional loading behavior in a general rate and their applications to metals and soils are described in detail, and constitutive equations of friction behavior between solids and its application to the prediction of stick-slip phenomena are delineated. In addition, the return-mapping algorithm, the consistent tangent operators and the objective time-integration

algorithm of rate tensor are explained in order to enforce the FEM analyses. All the derivation processes and formulations of equations are described in detail without an abbreviation throughout the book. The distinguishable features and importance of this book is the comprehensive description of fundamental concepts and formulations including the objectivity of tensor and constitutive equations, the objective time-derivative of tensor functions, the associated flow rule, the loading criterion, the continuity and smoothness conditions and their substantial physical interpretations in addition to the wide classes of reversible/irreversible constitutive equations of solids and friction behavior between solids.

Elasticity, Plasticity and Structure of Matter CRC Press

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Elasticity, Plasticity and Structure of Matter Springer Science & Business

Applied Elasticity and Plasticity is a comprehensive work that introduces graduate students and professionals in civil, mechanical, aeronautical and metallurgical engineering to the basic theories of elasticity, plasticity and their practical applications. Based on experimental data of static tension tests of material, several elastic and plastic stress-strain relations are derived, and commonly-used yield criteria and strain hardening rules are discussed as well. Analysis of conventional, deviatoric and mathematical stress and strain in two and three dimensions is presented. Analytical applications include torsion and bending of structural components subjected to various loadings, thick-walled cylindrical and spherical vessels subjected to internal and external pressures, stress-concentrations around holes, stress-intensity factors in structural components containing circular, elliptical and many more concepts important for professionals and students alike.