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Engineering Plasticity Plasticity for Mechanical Engineers [by] W. Johnson [and] P.B. Mellor Sensitivy Analysis of the Johnson-Cook Plasticity Model for Hypervelocity Impacts Plasticity for Mechanical Engineers Metal Forming Plasticity Deformation Theory of Plasticity Engineering Plasticity and Impact Dynamics Engineering Plasticity and Impact Dynamics Plane-Strain Slip-Line Fields for Metal-Deformation Processes Applied Plasticity, Second Edition Dynamic Plasticity Applied Plasticity The Thermomechanics of Plasticity and Fracture Theory of Plasticity Problems of Technological Plasticity (Pushing) the Limits of Neuroplasticity Induced by Adult Language Acquisition Plasticity for Engineers Metal Matrix Composites Structural Plasticity Dynamic Models for Structural Plasticity Plasticity Engineering Plasticity Computational Plasticity in Powder Forming Processes Plasticity Theory Plasticity, Limit Analysis, Stability And Structural Design: An Academic Life Journey From Theory To Practice Advances in Engineering Plasticity and its Applications Computational Plasticity Plasticity Comparison and Parameter Identification of Plasticity Models A Course on Plasticity Theory Advances in Engineering Plasticity and its Applications (AEPA '96) Phenotypic Plasticity Unified Constitutive Equations for Creep and Plasticity Plasticity and Beyond Introduction to Engineering Plasticity Plasticity Phenotypic Plasticity & Evolution Advances in Engineering Plasticity XI Hormones and Brain Plasticity Crystal Plasticity Finite Element Methods

Phenotypic Plasticity & Evolution Mar 21 2020 Phenotypic plasticity – the ability of an individual organism to alter its features in direct response to a change in its environment – is ubiquitous. Understanding how and why this phenomenon exists is crucial because it unites all levels of biological inquiry. This book brings together researchers who approach plasticity from diverse perspectives to explore new ideas and recent findings about the causes and consequences of plasticity. Contributors also discuss such controversial topics as how plasticity shapes ecological and evolutionary processes; whether specific plastic responses can be passed to offspring; and whether plasticity has left an important imprint on the history of life. Importantly, each chapter highlights key questions for future research. Drawing on numerous studies of plasticity in natural populations of plants and animals, this book aims to foster greater appreciation for this important, but frequently misunderstood phenomenon. Key Features Written in an accessible style with numerous illustrations, including many in color Reviews the history of the study of plasticity, including Darwin’s views Most chapters conclude with recommendations for future research

Hormones and Brain Plasticity Jan 19 2020 The nervous system has a remarkable capacity for self-reorganization, and in this first systematic analysis of the interaction between hormones and brain plasticity, Luis Miguel Garcia-Segura proposes that hormones modulate metaplasticity in the brain. He covers a wide variety of hormones, brain regions, and neuroplastic events, and also provides a new theoretical background with which to interpret the interaction of hormones and brain remodeling throughout the entire life of the organism. Garcia-Segura argues that hormones are indispensable for adequately adapting the endogenous neuroplastic activity of the brain to the incessant modifications in external and internal environments. Their regulation of neuroplastic events in a given moment predetermines new neuroplastic responses that will occur in the future, adapting brain reorganization to changing physiological and behavioral demands throughout the life of the organism. The cross-regulation of brain plasticity and hormones integrates information originated in multiple endocrine glands and body organs with information coming from the external world in conjunction with the previous history of the organism. Multiple hormonal signals act in concert to regulate the generation of morphological and functional changes in neural cells, as well as the replacement of neurons, glial, and endothelial cells in neural networks. Brain remodeling, in turn, is involved in controlling the activity of the endocrine glands and regulating hormonal secretions. This bidirectional adjustment of brain plasticity in response to hormonal inputs, and adjustment of hormonal concentrations in response to neuroplastic events are crucial for maintaining the stability of the inner milieu and for the generation of adequate behavioral responses in anticipation of--and in adaptation to--new social and environmental circumstances and life events, including pathological conditions.

Advances in Engineering Plasticity XI Feb 18 2020 Volume is indexed by Thomson Reuters CPCI-S (WoS). This special issue of the Key Engineering Materials contains the papers presented in the 11th Asia-Pacific Conference on Engineering Plasticity and Its Applications (AEPA2012), held in Singapore, 5-7 December 2012. This conference continues the primary objective of bringing together an international group of scientists, researchers and engineers from academic to industrial institutions, to exchange original ideas, discuss new developments and disseminate the latest research findings in the field of engineering plasticity. Previous symposia have been successfully held in Hong Kong (1992), Beijing (1994), Hiroshima (1996), Seoul (1998), Hong Kong (2000), Sydney (2002), Shanghai (2004), Nagoya (2006), Daejeon (2008) and Wuhan (2010).

Plasticity Apr 21 2020 Explores the Principles of Plasticity Most undergraduate programs lack an undergraduate plasticity theory course, and many graduate programs in design and manufacturing lack a course on plasticity—leaving a number of engineering students without adequate information on the subject. Emphasizing stresses generated in the material and its effect, Plasticity: Fundamentals and Applications effectively addresses this need. This book fills a void by introducing the basic fundamentals of solid mechanics of deformable bodies. It provides a thorough understanding of plasticity theory, introduces the concepts of plasticity, and discusses relevant applications. Studies the Effects of Forces and Motions on Solids The authors make a point of highlighting the importance of plastic deformation, and also discuss the concepts of elasticity (for a clear understanding of plasticity, the elasticity theory must also be understood). In addition, they present information on updated Lagrangian and Eulerian formulations for the modeling of metal forming and machining. Topics covered include: Stress Strain Constitutive relations Fracture Anisotropy Contact problems Plasticity: Fundamentals and Applications enables students to understand the basic fundamentals of plasticity theory, effectively use commercial finite-element (FE) software, and eventually develop their own code. It also provides suitable reference material for mechanical/civil/aerospace engineers, material processing engineers, applied mechanics researchers, mathematicians, and other industry professionals.

Unified Constitutive Equations for Creep and Plasticity Jul 25 2020 Constitutive equations refer to 'the equations that constitute the material response' at any point within an object. They are one of the ingredients necessary to predict the deformation and fracture response of solid bodies (among other ingredients such as the equations of equilibrium and compatibility and mathematical descriptions of the configuration and loading history). These ingredients are generally combined together in complicated computer programs, such as finite element analyses, which serve to both codify the pertinent knowledge and to provide convenient tools for making predictions of peak stresses,

plastic strain ranges, crack growth rates, and other quantities of interest. Such predictions fall largely into two classes: structural analysis and manufacturing analysis. In the first category, the usual purpose is life prediction, for assessment of safety, reliability, durability, and/or operational strategies. Some high-technology systems limited by mechanical behavior, and therefore requiring accurate life assess ments, include rocket engines (the space-shuttle main engine being a prominent example), piping and pressure vessels in nuclear and non-nuclear power plants (for example, heat exchanger tubes in solar central receivers and reformer tubes in high-temperature gas-cooled reactors used for process heat applications), and the ubiquitous example of the jet engine turbine blade. In structural analysis, one is sometimes concerned with predicting distortion per se, but more often, one is concerned with predicting fracture; in these cases the informa tion about deformation is an intermediate result en route to the final goal of a life prediction.

Engineering Plasticity Jul 05 2021 Engineering Plasticity focuses on certain features of the theory of plasticity that are particularly appropriate 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. Torsion, indentation problems, and slip-line fields are also discussed. 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 and the nature of physical theories. The reader is then introduced to the general problem of 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 explore 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 considered, along with wire-drawing and extrusion and the effects of changes in geometry on structure. This monograph is intended for students of engineering.

Structural Plasticity Oct 08 2021 Limit and shakedown analysis for structures can provide a very useful tool for design and analysis of engineering structures. "Structural Plasticity - Limit, Shakedown and Dynamic Plastic Analyses of Structure" provides more general solutions of limit and shakedown analysis for structures by using a unified strength theory. A series of solutions of plates from circular, annular plates to rhombus plates and square plates, rotating discs and cylinders, pressure vessels are presented. These results encompass the Tresca-Mohr-Coulomb solution of structure as special cases. The unified solution, which cannot be obtained by using a single criterion, is suitable to more materials and structures. Maohong Yu is professor of Department of Civil Engineering at Xi'an Jiaotong University, China. He has authored 12 books including "Unified Strength Theory and Its Applications" and "Generalized Plasticity".

(Pushing) the Limits of Neuroplasticity Induced by Adult Language Acquisition Jan 11 2022 Most adults attempt to learn a second or even third language at some point in their life. Since language exposure is one of the most intense cognitive training regimes one can encounter, it is not surprising that previous research has shown that multilingualism can induce profound change in the brain or ‘neuroplasticity’.What remains unclear is the scope of such adult language learning induced neuroplasticity. In other words, much is yet to be investigated about the factors that limit or promote adult language learning induced neuroplasticity. On the one hand, the present research topic discusses research that sheds light on neural mechanisms that limit adult language learning induced neuroplasticity such as: neural mechanisms of first language interference in the acquisition of a second language and reduced opportunity for language induced neuroplasticity due to aging. On the other hand, the Research Topic discusses factors that could enhance non-native language learning (and underlying neuroplastic mechanisms), such as the duration of the training regime, language aptitude, and meta-linguistic awareness. Therefore, the goal of the present Research Topic is to examine both the limits of neuroplasticity in adult language learning and the ways to push beyond those limits. Understanding of such limits and frontiers to push beyond the limits is not only theoretically fundamental but could also have practical implications for enhancing language training programmes.

Plasticity for Mechanical Engineers [by] W. Johnson [and] P.B. Mellor Mar 25 2023

Computational Plasticity in Powder Forming Processes Jun 04 2021 The powder forming process is an extremely effective method of manufacturing structural metal components with high-dimensional accuracy on a mass production basis. The process is applicable to nearly all industry sectors. It offers competitive engineering solutions in terms of technical performance and manufacturing costs. For these reasons, powder metallurgy is developing faster than other metal forming technology. Computational Plasticity in Powder Forming Proceses takes a specific look at the application of computer-aided engineering in modern powder forming technologies, with particular attention given to the Finite Element Method (FEM). FEM analysis provides detailed information on conditions within the processed material, which is often more complete than can be obtained even from elaborate physical experiments, and the numerical simulation makes it possible to examine a range of designs, or operating conditions economically. * Describes the mechanical behavior of powder materials using classical and modern constitutive theories. * Devoted to the application of adaptive FEM strategy in the analysis of powder forming processes. * 2D and 3D numerical modeling of powder forming processes are presented, using advanced plasticity models.

Theory of Plasticity Mar 13 2022 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.

Deformation Theory of Plasticity Nov 21 2022

Dynamic Plasticity Jun 16 2022 Dynamic Plasticity discusses the problems encountered in the theory of dynamic deformation of plastic bodies. The book describes one-dimensional problems involving a single component of stress, particle velocity, and single spatial coordinate. The propagation of longitudinal elastic-plastic waves in thin rods or wires is a simple example of this problem of dynamic plasticity. Another one-dimensional problem, which has various possible transverse motions, is the dynamics of extensible strings. This problem is associated in calculations dealing with cables of suspension bridges, of elevator cables, of electric cables. The analogy with the mechanics of extensible strings can be extended to circular and rectangular membranes such as explained by Karunes and Onat. Karunes and Onat analyzed the propagation of transverse and longitudinal shock waves in such membranes using the Rakhmatulin theory for strings. The text also discusses axi-symmetrical problems and the problems of soil mechanics when applied to soft soils. The book can prove valuable to civil engineers, structural engineers, physicist, and students of mechanical engineering or industrial design.

Metal Forming Plasticity Dec 22 2022 The International Union of Theoretical and Applied Mechanics (IUTAM) which is the head

organisation of most of the existing national and international societies of mechanics, decided to sponsor a Symposium on METAL FORMING PLASTICITY. It was held near Munich (Federal Republic of Germany) between August 28 and September 3, 1978, in the "Evange lische Academy" in the Castle of Tutzing which is situ ated in a park at Lake Starnberg overlooking the Alps. The subjects of the Symposium were basic aspects of the theoretical and experimental mechanics of metal form ing processes rather than technological details, or plas ticity as such. Thus the spectrum of the Conference extended from necessary physical background, through ex perimental, analytical, or numerical methods, to appli cations to specific technological deformation processes such as rolling, deep drawing, extrusion, etc. The following persons were by the IUTAM-bureau ap pointed to membership of the "Scientific Committee" which was responsible for the nomination of participants as well as for the form of the scientific program: w. Johnson (U.K.), H. Kudo (Japan), H. Lippmann (F.R.G, chairman), G.S. Pisarenko (USSR), anc W. Szczepinski (Poland) . The technical organisation was in the hands of a "Local Organizing Committee" formed by VI F. Fischer, K. Heckel, G. Kuhn, H. Lippmann (chairman), K. Magnus, V. Mannl, G. Sonntag, all of them from Munich and K. Lange (Stuttgart), O. Pa'Nelski (DUsseldorf) . This committee was supported by two secretaries, i.e.

Applied Plasticity May 15 2022 Mechanical engineering, an engineering discipline forged and shaped by the needs of the industrial revolution, is once again asked to do its substantial share in the call for industrial renewal. The general call is urgent as we face profound issues of productivity and competitiveness that require engineering solutions, among others . The Mechanical Engineering Series features graduate texts and research monographs intended to address the need for information in contemporary areas of mechanical engineering. The series is conceived as a comprehensive one that covers a broad range of c- centrations important to mechanical engineering graduate education and research . We are fortunate to have a distinguished roster of consulting editors on the ad- sory board, each an expert in one of the areas of concentration . The names of the consulting editors are listed on the facing page of this volume . The areas of conc- tration are applied mechanics, biomechanics, computational mechanics, dynamic systems and control, energetics , mechanics of materials, processing, production systems, thermal science, and tribology .

Metal Matrix Composites Nov 09 2021 Fourteen peer-reviewed papers on testing techniques, analysis approaches, and descriptions of various failure processes. From the Symposium on [title] held at Sparks, NV, April 1988. Annotation copyright Book News, Inc. Portland, Or.

Plasticity for Engineers Dec 10 2021 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.

Sensitivy Analysis of the Johnson-Cook Plasticity Model for Hypervelocity Impacts Feb 24 2023

Engineering Plasticity and Impact Dynamics Oct 20 2022 Plasticity and impact dynamics are two important areas in engineering practice, which includes structural engineering, crashworthiness, metal formation and new structural materials. The application of engineering plasticity and impact dynamics has resulted in significant achievements both technically and economically.This book presents the state-of-the-art developments in the above fields. It contains over 15 chapters written by experts in engineering plasticity and impact dynamics. It covers a wide range of theoretical developments and engineering applications, including fundamentals of energy absorption, applications of new materials, crashworthiness, bifurcation in plasticity, microdynamics, penetration, wave propagation, fracture, laser impact and particle-impact-induced erosion.

The Thermomechanics of Plasticity and Fracture Apr 14 2022 This book concentrates upon the mathematical theory of plasticity and fracture as opposed to the physical theory of these fields, presented in the thermomechanical framework.

Dynamic Models for Structural Plasticity Sep 07 2021 Our topic is irreversible or plastic deformation of structural elements composed of relatively thin ductile materials. These deformations are commonly used in sheet metal forming operations to produce lightweight parts of any particular shape. In another context, this type of plastic deformation is described as impact damage in the case of structural components involved in collision. Here we are concerned with mechanics of both static and dynamic deformation processes. The purpose is to use typical material properties and structural characteristics to calculate the deformation for certain types of load; in particular to find the final deflection and shape of the deformed structure and to illustrate how the development of this final shape depends on the constitutive model used to represent the material behavior. The major issue to be addressed is which structural and constitutive properties are important for calculating response to either static or brief but intense dynamic loads. Furthermore, how do the results of various constitutive models compare with observed behavior.

Plasticity Theory May 03 2021 The aim of Plasticity Theory is to provide a comprehensive introduction to the contemporary state of knowledge in basic plasticity theory and to its applications. It treats several areas not commonly found between the covers of a single book: the physics of plasticity, constitutive theory, dynamic plasticity, large-deformation plasticity, and numerical methods, in addition to a representative survey of problems treated by classical methods, such as elastic-plastic problems, plane plastic flow, and limit analysis; the problem discussed come from areas of interest to mechanical, structural, and geotechnical engineers, metallurgists and others. The necessary mathematics and basic mechanics and thermodynamics are covered in an introductory chapter, making the book a self-contained text suitable for advanced undergraduates and graduate students, as well as a reference for practitioners of solid mechanics.

Plasticity Dec 30 2020 Focussing on theoretical aspects of the small-strain theory of hardening elastoplasticity, this monograph provides a comprehensive and unified treatment of the mathematical theory and numerical analysis, exploiting in particular the great advantages gained by placing the theory in a convex analytic context. Divided into three parts, the first part of the text provides a detailed introduction to plasticity, in which the mechanics of elastoplastic behaviour is emphasised, while the second part is taken up with mathematical analysis of the elastoplasticity problem. The third part is devoted to error analysis of various semi-discrete and fully discrete approximations for variational formulations of the elastoplasticity.

Plasticity and Beyond Jun 23 2020 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.

Problems of Technological Plasticity Feb 12 2022 In this book the classical rigid-plastic model of deformed workpiece and the characteristic (slipline) method of analysis is assumed. The rigid-plastic solid assumption is deemed reasonable for the problems of technological plasticity with large scale plastic flow, where small elastic stains are negligible. Along with classical results of the theory of plasticity the book includes

many original analytical and numerical solutions of the problems of technological plasticity obtained by the authors in Russia and unknown for most western readers. The results of the analyses are given by analytical formulae and many graphs and tables, so the book will be useful for the practical and research engineers. It may also be used as a textbook by graduate students and engineers.

Crystal Plasticity Finite Element Methods Dec 18 2019 Written by the leading experts in computational materials science, this handy reference concisely reviews the most important aspects of plasticity modeling: constitutive laws, phase transformations, texture methods, continuum approaches and damage mechanisms. As a result, it provides the knowledge needed to avoid failures in critical systems udner mechanical load. With its various application examples to micro- and macrostructure mechanics, this is an invaluable resource for mechanical engineers as well as for researchers wanting to improve on this method and extend its outreach.

Computational Plasticity Jan 31 2021 “Computational Plasticity with Emphasis on the Application of the Unified Strength Theory” explores a new and important branch of computational mechanics and is the third book in a plasticity series published by Springer. The other two are: Generalized Plasticity, Springer: Berlin, 2006; and Structural Plasticity, Springer and Zhejiang University Press: Hangzhou, 2009. This monograph describes the unified strength theory and associated flow rule, the implementation of these basic theories in computational programs, and shows how a series of results can be obtained by using them. The unified strength theory has been implemented in several special nonlinear finite-element programs and commercial Finite Element Codes by individual users and corporations. Many new and interesting findings for beams, plates, underground caves, excavations, strip foundations, circular foundations, slop, underground structures of hydraulic power stations, pumped-storage power stations, underground mining, high-velocity penetration of concrete structures, ancient structures, and rocket components, along with relevant computational results, are presented. This book is intended for graduate students, researchers and engineers working in solid mechanics, engineering and materials science. The theories and methods provided in this book can also be used for other computer codes and different structures. More results can be obtained, which put the potential strength of the material to better use, thus offering material-saving and energy-saving solutions. Mao-Hong Yu is a professor at the Department of Civil Engineering at Xi'an Jiaotong University, Xi'an, China.

Comparison and Parameter Identification of Plasticity Models Nov 28 2020

Plane-Strain Slip-Line Fields for Metal-Deformation Processes Aug 18 2022 Plane-Strain Slip-Line Fields for Metal-Deformation Processes: A Source Book and Bibliography provides information pertinent to the theory and application of plain-train slip fields to metal-working problems. This book discusses the industrial importance of axial symmetry. Organized into seven chapters, this book begins with an overview of the oldest processes of metal forming, including forging, coining, hammering, drifting, cutting, or parting. This text then examines the basic aspects of the basic theory of classical plasticity. Other chapters consider the governing equations of the plane plastic flow of a rigid-perfectly plastic solid. This book discusses as well the methods for the solution of problems of plane plastic flow of a rigid-perfectly plastic solid. The final chapter deals with the application of the theory of plasticity to the quasi-static plane-strain deformation of an isotropic rigid-perfectly plastic, rate insensitive material. This book is a valuable resource for mechanical engineers, materials scientists, teachers, and research workers.

Plasticity, Limit Analysis, Stability And Structural Design: An Academic Life Journey From Theory To Practice Apr 02 2021 This book is a personal anthology of the author's utmost academic works and accomplishments with his former students and colleagues intended as an enduring record for the engineering community for many years to come.The author's forty-year professional career and academic life journey is first briefly sketched in Chapter 1 and more details are elaborated in three chapters that follow: Chapter 2: The first ten years at Lehigh — beginning to show; Chapter 3: Twenty=three years at Purdue — the highly productive years; and Chapter 4: seven years at UH — the pursuit of excellence. The author's specific academic contributions are documented in the following three chapters: Chapter 5: 23 academic bulletins are selected to highlight his 10 major research areas; Chapter 6: 23 Academic masterpiece books are listed along with their respective peer review comments; and Chapter 7: academic publications include journal articles, conference proceedings and symposiums, and lectures and keynotes. The book ends with the listing of all the author's 55 doctoral students' dissertation titles in Chapter 8.In 1975 at Lehigh, the author published a milestone treatise on Limit Analysis and Soil Plasticity. In 1982 at Purdue, he published another pioneering work on Plasticity in Reinforced Concrete.In September 1999, the author was recruited by UH to take the Deanship of the College of Engineering to accomplish the noble mission: to build the College to become one of the top 50 engineering schools by strengthening the faculty, improving the facilities, and increasing the enrollment. Over his seven years at UH, a lot of progress was made in all these three areas — the research program expanded, facilities improved, and enrollment increased.

Plasticity for Mechanical Engineers Jan 23 2023

Advances in Engineering Plasticity and its Applications Mar 01 2021 Classical plasticity is a well established domain of mechanics and engineering, providing the basis for many engineering structural design, manufacturing processes and natural phenomena. New important characteristics are emerging in the interdisciplinary approach of micro-, meso- and macro-mechanics, and through analysis, experiments and computation. The interaction of mechanics and materials scientists is introducing tremendous changes in the two disciplines, so that the possibility of materials being processed on the microscale to achieve the desired macroscopic properties is rapidly approaching. A comprehensive overview on the latest developments in both macroplasticity and microplasticity theories, their interactions and applications in various engineering disciplines such as solid mechanics, structural analysis and geo-mechanics, materials science and technology, and metal forming and machining, is given in this volume. Case studies written by international experts focus on aspects such as the applications of plasticity in interdisciplinary and non-conventional areas. The 150 papers provide a current and useful reference source on the latest advances for both research workers and engineers in the various fields of plasticity.

A Course on Plasticity Theory Oct 28 2020 Plasticity Theory is characterized by many competing and often incompatible points of view. This book seeks to strengthen the foundations of continuum plasticity theory, emphasizing a unifying perspective grounded in the fundamental notion of material symmetry. Steigmann's book offers a systematic framework for the proper understanding of established models of plasticity and for their modern extensions and generalizations. Particular emphasis is placed on the differential-geometric aspects of the subject and their role in illuminating the conceptual foundations of plasticity theory. Classical models, together with several subjects of interest in contemporary research, are developed in a unified format. The book is addressed to graduate students and academics working in the field of continuum mechanics.

Advances in Engineering Plasticity and its Applications (AEPA '96) Sep 26 2020 AEPA '96 provides a forum for discussion on the state-of-art developments in plasticity. An emphasis is placed on the close interaction of the theories from macroplasticity, mesoplasticity and microplasticity together with their applications in various engineering disciplines such as solid mechanics, metal forming, structural analysis, geo-mechanics and micromechanics. These proceedings include over 140 papers from the conference including case studies showing applications of plasticity in inter-disciplinary or nonconventional areas.

Engineering Plasticity Apr 26 2023

Phenotypic Plasticity Aug 26 2020 "The author begins by defining phenotypic plasticity and detailing its history, including important experiments and methods of statistical and graphical analysis. He then provides extended examples and discussion of the molecular basis of plasticity, the plasticity of development, the ecology of plastic responses, and the role of costs and constraints in the evolution of plasticity. A brief epilogue looks at how plasticity studies shed light on the nature/nurture debate in the popular media.".
Engineering Plasticity and Impact Dynamics Sep 19 2022
Applied Plasticity, Second Edition Jul 17 2022 This book begins with the fundamentals of the mathematical theory of plasticity. The discussion then turns to the theory of plastic stress and its applications to structural analysis. It concludes with a wide range of topics in dynamic plasticity including wave propagation, armor penetration, and structural impact in the plastic range. In view of the rapidly growing interest in computational methods, an appendix presents the fundamentals of a finite-element analysis of metal-forming problems.
Plasticity Aug 06 2021 Publisher Description
Introduction to Engineering Plasticity May 23 2020 The theory of plasticity is a branch of solid mechanics that investigates the relationship between permanent deformation and load, and the distribution of stress and strains of materials and structures beyond their elastic limit. Engineering plasticity underpins the safety of many modern systems and structures. Realizing the full potential of materials as well as designing precise metal processing and energy absorption structures requires mastery of engineering plasticity. Introduction to Engineering Plasticity: Fundamentals with Applications in Metal Forming, Limit Analysis and Energy Absorption presents both fundamental theory on plasticity and emphasizes the latest engineering applications. The title combines theory and engineering applications of plasticity, elaborating on problem solving in real-world engineering tasks such as in metal forming, limit analysis of structures, and understanding the energy absorption of structures and materials. The five main parts of the book cover: Plastic properties of materials and their characterization; Fundamental theory in plasticity; Elastic-plastic problems and typical solutions; and Rigid-plastic problems under plane-stress conditions. This title provides students and engineers alike with the fundamentals and advanced tools needed in engineering plasticity. Brings together plasticity theory with engineering applications and problem solving Elaborates problem solving methods and demonstrates plasticity in various engineering fields Covers the recent decades of research on metal forming and limit analysis Includes energy absorption of new structures and materials where plasticity dominates analysis and design Gives a systematic account of the theory of plasticity alongside its engineering applications