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Video Coding CRC Press Mechanics of Composite Materials: Recent Advances covers the proceedings of the International Union of Theoretical and Applied Mechanics (IUTAM) Symposium on Mechanics of Composite Materials. The book reviews papers that emphasize fundamental mechanics, developments, and unresolved problems of the field. The text covers topics such as mechanical properties of composite materials; influence of microstructure on the thermoplastics and transport properties of particulate and short-fiber composites; and further applications of the systematic theory of materials with disordered constitution. The selection also explains the curved thermal crack growth in the interface of a unidirectional carbon-aluminum composite and energy release rates of various microcracks in short-fiber composites. The book will be of great interest to researchers and professionals whose line of work requires the understanding of the mechanics of composite materials. **Some Two- and Three-dimensional Stress Analyses in Solid Mechanics** Springer Nature

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".

Theory and Analysis, Second Edition CRC Press

Explains the physical principles of wave propagation and relates them to ultrasonic wave mechanics and the more recent guided wave techniques that are used to inspect and evaluate aircraft, power plants, and pipelines in chemical processing. An invaluable reference to this active field for graduate students, researchers, and practising engineers.

Modern Computational Methods Springer Science & Business Media

This is an intermediate book for beginning postgraduate students and junior researchers, and offers up-to-date content on both continuum mechanics and elasticity. The material is self-contained and should provide readers sufficient working knowledge in both areas. Though the focus is primarily on vector and tensor calculus (the so-called coordinate-free approach), the more traditional index notation is used whenever it is deemed more sensible. With the increasing demand for continuum modeling in such diverse areas as mathematical biology and geology, it is imperative to have various approaches to continuum mechanics and elasticity. This book presents these subjects from an applied mathematics perspective. In particular, it extensively uses linear algebra and vector calculus to develop the fundamentals of both subjects in a way that requires minimal use of coordinates (so that beginning graduate students and junior researchers come to appreciate the power of the tensor notation).

Metal Failures John Wiley & Sons

A major basic text on the theory and structural applications of laminated anisotropic plates. Detailed coverage of problems of bending under transverse load, stability, and free-vibrations, as well as laminated beams, expansional strain effects, curved plates, and free-edge effects.

Theory, Applications, and Numerics Рипол Классик

Exceptionally clear text treats elasticity from engineering and mathematical viewpoints. Comprehensive coverage of stress, strain, equilibrium, compatibility, Hooke's law, plane problems, torsion, energy, stress functions, more. 114 illustrations. 1967 edition.

Elasticity Routledge

This book is a product of the understanding I developed of stress analysis applied to plastics, while at work at L. J. Broutman and Associates (UBA) and as a lecturer in the seminars on this topic co-sponsored by UBA and Society of Plastics Engineers. I believe that by its extent and level of treatment, this book would serve as an easy-to-read desktop reference for professionals, as well as a text book at the junior or senior level in undergraduate programs. The main theme of this book is what to do with computed stress. To approach the theme effectively, I have taken the "stress category ap proach" to stress analysis. Such an approach is being

successfully used in the nuclear power field. In plastics, this approach helps in the prediction of long term behavior of structures. To maintain interest I have limited derivations and proofs to a minimum, and provided them, if at all, as flow charts. In this way, I believe that one can see better the connection between the variables, assumptions, and mathematics.

Mechanics of Composite Materials CRC Press

Showcasing vital engineering applications to transient and dynamic pertubations of macromolecular materials, structural recovery's role in mechanical responses in the glassy state, and viscoelastic parameters that condition the non-Newtonian behaviour of polymers, this work presents a systematic account of the responses of macromolecular materials

Micromanufacturing and Nanotechnology Cambridge University Press

The use of composite materials in engineering structures continues to increase dramatically, and there have been equally significant advances in modeling for general and composite materials and structures in particular. To reflect these developments, renowned author, educator, and researcher J.N. Reddy created an enhanced second edit

Advances in Structural Engineering Springer

The third international workshop on applications of computational mechanics in geotechnical engineering discussed the area of computational mechanics applied to geotechnical problems. During the event, topics such as ground reinforcement and computational models were covered.

Ultrasonic Waves in Solid Media Butterworth-Heinemann

Everyone involved with the mechanics of composite materials and structures must have come across the works of Dr. N.J. Pagano in their research. His research papers are among the most referenced of all existing literature in the field of mechanics of composite materials. This monograph makes available, in one volume, all Dr. Pagano's major technical papers. Most of the papers included in this volume have been published in the open literature, but there are a few exceptions -- a few key, unpublished reports have been included for continuity. The topics are: some basic studies of anisotropic behavior, exact solutions for elastic response, role of micromechanics, and some carbon--carbon spinoffs. The volume can be used as a reference book by researchers in academia, industry, and government laboratories, and it can be used as a reference text for a graduate course on the mechanics of composite materials.

Mechanics of Composite Materials Springer Nature

Widely regarded as the most authoritative and comprehensive book inits field, the fourth edition of Fundamentals of RockMechanics includes new and substantially updated chapters tothis highly praised text. Extensively updated throughout, this new edition containssubstantially expanded chapters on poroelasticity, wavepropogation, and subsurface stresses Features entirely new chapters on rock fractures andmicromechanical models of rock behaviour Discusses fundamental concepts such as stress and strain Offers a thorough introduction to the subject before expertlydelving into a fundamental, self-contained discussion of specifictopics Unavailable for many years, now back by popular demand. An Instructor manual CD-ROM for this title is available. Pleasecontact our Higher Education team at ahref="mailto: HigherEducation@wiley.com"HigherEducation@wiley.com/afor more information. Reviews: “ With this attention to detail, and rigorous adherence toclarity and exactness in description, this edition will consolidatethe standing achieved by the earlier editions as a mostauthoritative and comprehensive book in its field. It will continueto serve as a leading reference work for geoscientists interestedin structural geology, tectonics and petrophysics as well as forcivil, mining and petroleum

engineers. ” (PetroleumGeoscience) "...I consider this book to be an invaluable reference forstudying and understanding the fundamental science at the base ofrock mechanics. I believe this to be a must-have textbook and Istrongly recommend it to anyone, student or professional,interested in the subject." (Rock Mechanics and RockEngineering) "An excellent book, very well presented, and is a must for theshelves of serious engineers and scientists active or interested inthe fields of rock mechanics and rock engineering.... Highlyrecommended." (South African Geographical Journal, 2008)

Structural Geology and Personal Computers Springer Science & Business Media

“ 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.

Recent Advances Routledge

In recent years there has been an increasing interest in Second Generation Image and Video Coding Techniques. These techniques introduce new concepts from image analysis that greatly improve the performance of the coding schemes for very high compression. This interest has been further emphasized by the future MPEG 4 standard. Second generation image and video coding techniques are the ensemble of approaches proposing new and more efficient image representations than the conventional canonical form. As a consequence, the human visual system becomes a fundamental part of the encoding/decoding chain. More insight to distinguish between first and second generation can be gained if it is noticed that image and video coding is basically carried out in two steps. First, image data are converted into a sequence of messages and, second, code words are assigned to the messages. Methods of the first generation put the emphasis on the second step, whereas methods of the second generation put it on the first step and use available results for the second step. As a result of including the human visual system, second generation can be also seen as an approach of seeing the image composed by different entities called objects. This implies that the image or sequence of images have first to be analyzed and/or segmented in order to find the entities. It is in this context that we have selected in this book three main approaches as second generation video coding techniques: Segmentation-based schemes Model Based Schemes Fractal Based Schemes £ /LIST £ Video Coding: The Second Generation Approach is an important introduction to the new coding techniques for video. As such, all researchers, students and practitioners working in image processing will find this book of interest.

Mine Planning and Equipment Selection 1997 CRC Press

A thorough understanding of the kinematic and mechanical evolution of fault-related structures is of great value, both academic (e.g. How do mountains form?) and practical (e.g. How are valuable hydrocarbons trapped in fault-related folds?). Precise knowledge of the present-day geometry is necessary to know where to drill for hydrocarbons. Understanding the evolution of a structure, including displacement fields, strain and stress history, may offer powerful insights to how and if hydrocarbons might have migrated, and the most efficient way to extract them. Small structures, including faults, fractures, pressure solution seams, and localized compaction, which may strongly influence subsurface fluid flow, may be predictable with a detailed mechanical understanding of a structure's evolution. The primary focus of this thesis is the integration of field observations, geospatial data including airborne LiDAR, and numerical modeling to investigate three dimensional deformational patterns associated with fault slip accumulated over geologic time scales. The work investigates contractional tectonics at Sheep Mountain anticline, Greybull, WY, and extensional tectonics at the Volcanic Tableland, Bishop, CA. A detailed geometric model is a necessary prerequisite for complete kinematic or mechanical analysis of any structure. High quality 3D seismic imaging data provides the means to characterize fold geometry for many subsurface industrial applications; however, such data is expensive, availability is limited, and data quality is often poor in regions of high topography where outcrop exposures are best. A new method for using high resolution topographic data, geologic field mapping and numerical interpolation is applied to model the 3D geometry of a reservoir-scale fold at Sheep Mountain anticline. The Volcanic Tableland is a classic field site for studies of fault slip scaling relationships and conceptual models for evolution of normal faults. Three dimensional elastic models are used to constrain subsurface fault geometry from detailed maps of fault scarps and topography, and to reconcile two potentially competing conceptual models for fault growth: by coalescence and by subsidiary faulting. The Tableland fault array likely initiated as a broad array of small faults, and as some have grown and coalesced, their strain shadows have inhibited the growth and initiation of nearby faults. The Volcanic Tableland also is used as a geologic example in a study of the capabilities and limitations of mechanics-based restoration, a relatively new approach to modeling in structural geology that provides distinct advantages over traditional kinematic methods, but that is significantly hampered by unphysical boundary conditions. The models do not accurately represent geological strain and stress distributions, as many have hoped. A new mechanics-based retrodeformational technique that is not subject to the same unphysical boundary conditions is suggested. However, the method, which is based on reversal of tectonic loads that may be optimized by paleostress analysis, restores only that topography which may be explained by an idealized elastic model. Elastic models are appealing for mechanical analysis of fault-related deformation because the linear nature of such models lends itself to retrodeformation and provides computationally efficient and stable numerical implementation for simulating slip distributions and associated deformation in complicated 3D fault systems. However, cumulative rock deformation is not elastic. Synthetic models are applied to investigate the implications of assuming elastic deformation and frictionless fault slip, as opposed to a more realistic elasto-plastic deformation with frictional fault slip. Results confirm that elastic models are limited in their ability to simulate geologic stress distributions, but that they may provide a reasonable, first-order approximation of strain tensor orientation and the distribution of

Elasticity Springer Nature

ElasticityTensor, Dyadic, and Engineering ApproachesCourier Corporation

Structural Analysis of Laminated Anisotropic Plates Stanford University

Introduction to Linear Elasticity, 3rd Edition provides an applications-oriented grounding in the tensor-based theory of elasticity for students in mechanical, civil, aeronautical, biomedical engineering, as well as materials and earth science. The book is distinct from the traditional text aimed at graduate students in solid mechanics by introducing its subject at a level appropriate for advanced undergraduate and beginning graduate students. The author's presentation allows students to apply the basic notions of stress analysis and move on to advanced work in continuum mechanics, plasticity, plate and shell theory, composite materials, and finite method analysis.

An Applied Mathematics Introduction CRC Press

Elasticity: Theory and Applications

Mechanics of Laminated Composite Plates and Shells Elsevier

This book presents the micromechanics of random structure heterogeneous materials, a multidisciplinary research area that has experienced a revolutionary renascence at the overlap of various branches of materials science, mechanical engineering, applied mathematics, technical physics, geophysics, and biology. It demonstrates intriguing successes of unified rigorous theoretical methods of applied mathematics and statistical physics in material science of microheterogeneous media. The prediction of the behaviour of heterogeneous materials by the use of properties of constituents and their microstructure is a central problem of micromechanics. This book is the first in micromechanics where a successful effort of systematic and fundamental research of the microstructure of the wide class of heterogeneous materials of natural and synthetic nature is attempted. The uniqueness of the book lies in its development and expressive representation of statistical methods quantitatively describing random structures which are at most adopted for the forthcoming evaluation of a wide variety of macroscopic transport, electromagnetic, strength, and elastoplastic properties of heterogeneous materials.

Fault-related Deformation Over Geologic Time Springer Science & Business Media

One of the only texts available to cover not only how failure occurs but also examine methods developed to expose the reasons for failure, Metal Failures has long been considered the most definitive and authoritative resources in metallurgical failure analysis. Now in a completely revised edition, this Second Edition features updates of all chapters plus new coverage of elastic behavior and plastic deformation, localized necking, the phenomenological aspects of fatigue, fatigue crack propagation, alloys and coatings, tensors and tensor notations, and much more.