Mechanical Behavior Of Materials 3rd Edition 2nd Custom Edition For The University Of Washington

Statics and Mechanics of Structures Mechanical Behavior of Materials **Mechanical Behavior of Materials** *Unit Manufacturing Processes* **Mechanical Behavior of Materials** *Mechanical Behavior of Materials* **Mechanical Behavior of Materials** *Dynamic Behavior of Materials Mechanical Behavior of Materials* **Mechanical Behavior of Materials** Mechanical Behaviour of Materials *Handbook of Materials Behavior Models, Three-Volume Set* Mechanical Behavior of Materials **Elements of Metallurgy and Engineering Alloys** *Mechanical Properties and Deformation Behavior of Materials Having Ultra-Fine Microstructures* **Mechanical Behavior of Materials** Mechanical Behavior of Materials **Mechanical Behaviour of Engineering Materials Linear and Non-linear Mechanical Behavior of Solid Materials** *Mechanical Behavior of Materials* **Mechanical Behavior and Fracture of Engineering Materials** Dynamic Behavior of Materials, Volume 1 Inelastic Behavior of Materials and Structures Under Monotonic and Cyclic Loading Mechanical Behavior of Engineering Materials **Modeling High Temperature Materials Behavior for Structural Analysis Analysis of Engineering Structures and Material Behavior Continuum Mechanics Modeling of Material Behavior** *Viscoelastic Behavior of Rubbery Materials* **The Behavior of Sandwich Structures of Isotropic and Composite Materials** *DISLOCATIONS AND MECHANICAL BEHAVIOUR OF MATERIALS* **Structural Analysis** *Mechanical Behavior of Biomaterials* **Mechanical Behavior of Materials eBook:International Edition** Behaviour of Granular Materials **Deformation and Fracture Behaviour of Polymer Materials The Mechanical Behavior of Materials X** Journal of the Mechanical Behavior of Materials **Mechanical Behavior of Materials: Concrete and cement paste. Glass and ceramics Multiscale Behavior of Materials and Structures The Mechanical Behaviour of Engineering Materials**

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Linear and Non-linear Mechanical Behavior of Solid Materials Jun 12 2021 This book offers an essential introduction to the linear and non-linear behavior of solid materials, and to the concepts of deformation, displacement and stress, within the context of continuum mechanics and thermodynamics. To illustrate the fundamental principles, the book starts with an overview of solid mechanics, experimental methods, classes of material behaviors, and the thermodynamic modeling framework. It then explores linear elastic behavior, thermoelasticity, plasticity, viscoplasticity,

fracture mechanics and damage behavior. The last part of the book is devoted to conventional and magnetic shape memory alloys, which may be used as actuators or sensors in adaptive structures. Given its range of coverage, the book will be especially valuable for students of engineering courses in Mechanics. Further, it includes a wealth of examples and exercises, making it accessible to the widest possible audience.

Mechanical Properties and Deformation Behavior of Materials Having Ultra-Fine Microstructures Oct 17 2021 In an attempt to meet the demand for new ultra-high strength materials, the processing of novel material configurations with unique microstructure is being explored in systems which are further and further from equilibrium. One such class of emerging materials is the so-called nanophased or nanostructured materials. This class of materials includes metals and alloys, ceramics, and polymers characterized by controlled ultra-fine microstructural features in the form oflayered, fibrous, or phase and grain distribution. While it is clear that these materials are in an early stage of development, there is now a sufficient body of literature to fuel discussion of how the mechanical properties and deformation behavior can be controlled through control of the microstructure. This NATO-Advanced Study Institute was convened in order to assess our current state of knowledge in the field of mechanical properties and deformation behavior in materials with ultra fine microstructure, to identify opportunities and needs for further research, and to identify the potential for technological applications. The Institute was the first international scientific meeting devoted to a discussion on the mechanical properties and deformation behavior of materials having grain sizes down to a few nanometers. Included in these discussions were the topics of superplasticity, tribology, and the supermodulus effect. Lectures were also presented which covered a variety of other themes including synthesis, characterization, thermodynamic stability, and general physical properties.

Mechanical Behavior of Materials Oct 29 2022 A balanced mechanics-materials approach and coverage of the latest developments in biomaterials and electronic materials, the new edition of this popular text is the most thorough and modern book available for upper-level undergraduate courses on the mechanical behavior of materials. To ensure that the student gains a thorough understanding the authors present the fundamental mechanisms that operate at micro- and nano-meter level across a wide-range of materials, in a way that is mathematically simple and requires no extensive knowledge of materials. This integrated approach provides a conceptual presentation that shows how the microstructure of a material controls its mechanical behavior, and this is reinforced through extensive use of micrographs and illustrations. New worked examples and exercises help the student test their understanding. Further resources for this title, including lecture slides of select illustrations and solutions for exercises, are available online at www.cambridge.org/97800521866758.

Continuum Mechanics Modeling of Material Behavior Oct 05 2020 Continuum Mechanics Modeling of Material Behavior offers a uniquely comprehensive introduction to topics like RVE theory, fabric tensor models, micropolar elasticity, elasticity with voids, nonlocal higher gradient elasticity and damage mechanics. Contemporary continuum mechanics research has been moving into areas of complex material microstructural behavior. Graduate students who are expected to do this type of research need a fundamental background beyond classical continuum theories. The book begins with several chapters that carefully and rigorously present mathematical preliminaries; kinematics of motion and deformation; force and stress measures; and mass, momentum and energy balance principles. The book then moves beyond other books by dedicating the last chapter to constitutive equation development, exploring a wide collection of constitutive relations and developing the corresponding material model formulations. Such material behavior models include classical linear theories of elasticity, fluid mechanics, viscoelasticity and plasticity, as well as linear and nonlinear theories of solids and fluids, including finite elasticity, nonlinear/non-Newtonian viscous fluids, and nonlinear viscoelastic materials. Finally, several relatively new continuum theories based on incorporation of material microstructure are presented including: fabric tensor theories, micropolar elasticity, elasticity with voids, nonlocal higher gradient elasticity and damage mechanics. Offers a thorough, concise and

organized presentation of continuum mechanics formulation Covers numerous applications in areas of contemporary continuum mechanics modeling, including micromechanical and multi-scale problems Integration and use of MATLAB software gives students more tools to solve, evaluate and plot problems under study Features extensive use of exercises, providing more material for student engagement and instructor presentation

Multiscale Behavior of Materials and Structures Sep 23 2019

Unit Manufacturing Processes Sep 27 2022 Manufacturing, reduced to its simplest form, involves the sequencing of product forms through a number of different processes. Each individual step, known as an unit manufacturing process, can be viewed as the fundamental building block of a nation's manufacturing capability. A committee of the National Research Council has prepared a report to help define national priorities for research in unit processes. It contains an organizing framework for unit process families, criteria for determining the criticality of a process or manufacturing technology, examples of research opportunities, and a prioritized list of enabling technologies that can lead to the manufacture of products of superior quality at competitive costs. The study was performed under the sponsorship of the National Science Foundation and the Defense Department's Manufacturing Technology Program.

The Mechanical Behaviour of Engineering Materials Aug 22 2019

Mechanical Behavior of Materials Dec 19 2021 An understanding of mechanisms for mechanical behavior is essential to applications of new materials and new designs using established materials. Focusing on the similarities and differences in mechanical response within and between the material classes, this book provides a balanced approach between practical engineering applications and the science behind mechanical behavior of materials. Covering the three main material classes: metals, ceramics and polymers, topics covered include stress, strain, tensors, elasticity, dislocations, strengthening mechanisms, high temperature deformation, fracture, fatigue, wear and deformation processing. Designed to provide a bridge between introductory coverage of materials science and strength of materials books and specialized treatments on elasticity, deformation and mechanical processing, this title: * Successfully employs the principles of physics and mathematics to the materials science topics covered. * Provides short biographical or historical background on key contributors to the field of materials science. * Includes over one hundred new figures and mechanical test data that illustrate the subjects covered. * Features numerous examples and more than 150 homework problems, with problems pitched at three levels.

Mechanical Behavior of Materials: Concrete and cement paste. Glass and ceramics Oct 24 2019

Mechanical Behaviour of Materials Feb 18 2022 The first volume of this two-volume work deals with elastic and elastoplastic behaviour; this second volume continues with viscoelasticity, damage, fracture (resistance to cracking) and contact mechanics.

Mechanical Behavior of Materials eBook:International Edition Mar 29 2020 For upper-level undergraduate engineering courses in Mechanical Behavior of Materials. Mechanical Behavior of Materials, 4/e introduces the spectrum of mechanical behavior of materials, emphasizing practical engineering methods for testing structural materials to obtain their properties, and predicting their strength and life when used for machines, vehicles, and structures. With its logical treatment and ready-to-use format, it is ideal for upper-level undergraduate students who have completed elementary mechanics of materials courses.

Structural Analysis May 31 2020 The authors and their colleagues developed this text over many years, teaching undergraduate and graduate courses in structural analysis courses at the Daniel Guggenheim School of Aerospace Engineering of the Georgia Institute of Technology. The emphasis is on clarity and unity in the presentation of basic structural analysis concepts and methods. The equations of linear elasticity and basic constitutive behaviour of isotropic and composite materials are reviewed. The text focuses on the analysis of practical structural components

including bars, beams and plates. Particular attention is devoted to the analysis of thin-walled beams under bending shearing and torsion. Advanced topics such as warping, non-uniform torsion, shear deformations, thermal effect and plastic deformations are addressed. A unified treatment of work and energy principles is provided that naturally leads to an examination of approximate analysis methods including an introduction to matrix and finite element methods. This teaching tool based on practical situations and thorough methodology should prove valuable to both lecturers and students of structural analysis in engineering worldwide. This is a textbook for teaching structural analysis of aerospace structures. It can be used for 3rd and 4th year students in aerospace engineering, as well as for 1st and 2nd year graduate students in aerospace and mechanical engineering.

Modeling High Temperature Materials Behavior for Structural Analysis Dec 07 2020 This monograph presents approaches to characterize inelastic behavior of materials and structures at high temperature. Starting from experimental observations, it discusses basic features of inelastic phenomena including creep, plasticity, relaxation, low cycle and thermal fatigue. The authors formulate constitutive equations to describe the inelastic response for the given states of stress and microstructure. They introduce evolution equations to capture hardening, recovery, softening, ageing and damage processes. Principles of continuum mechanics and thermodynamics are presented to provide a framework for the modeling materials behavior with the aim of structural analysis of high-temperature engineering components.

Analysis of Engineering Structures and Material Behavior Nov 05 2020 Theoretical and experimental study of the mechanical behavior of structures under load Analysis of Engineering Structures and Material Behavior is a textbook covering introductory and advanced topics in structural analysis. It begins with an introduction to the topic, before covering fundamental concepts of stress, strain and information about mechanical testing of materials. Material behaviors, yield criteria and loads imposed on the engineering elements are also discussed. The book then moves on to cover more advanced areas including relationships between stress and strain, rheological models, creep of metallic materials and fracture mechanics. Finally, the finite element method and its applications are considered. Key features: Covers introductory and advanced topics in structural analysis, including load, stress, strain, creep, fatigue and finite element analysis of structural elements. Includes examples and considers mathematical formulations. A pedagogical approach to the topic. Analysis of Engineering Structures and Material Behavior is suitable as a textbook for structural analysis and mechanics courses in structural, civil and mechanical engineering, as well as a valuable guide for practicing engineers.

Journal of the Mechanical Behavior of Materials Nov 25 2019

Behaviour of Granular Materials Feb 27 2020 This book presents a complete and comprehensive analysis of the behaviour of granular materials including the description of experimental results, the different ways to define the global behaviour from local phenomena at the particle scale, the various modellings which can be used for a D.E.M. analysis to solve practical problems and finally the analysis of strain localisation. The concepts developed in this book are applicable to many kinds of granular materials considered in civil, mechanical or chemical engineering.

Mechanical Behavior of Materials Aug 27 2022 Provides comprehensive treatment of the mechanical behavior of materials within a balanced mechanics-materials approach. Covering a range of materials, including metals, polymers, ceramics, and composites, this book presents the properties of materials while addressing the principal ideas behind theories of mechanical behavior. It includes broad treatment of flow and fracture criteria. It presents various mechanisms for tailoring the strength and toughness of materials. It also provides references and a list of suggested readings in each chapter. A valuable reference book on the mechanical behavior of materials for all practicing Mechanical and Materials Engineers.

The Behavior of Sandwich Structures of Isotropic and Composite Materials Aug 03 2020 The Behavior of Sandwich Structures of Isotropic and Composite Materials presents the mathematics, descriptions, and analytical techniques in the growing field of sandwich structures. From a background in sandwich structures to thermoelastic problems of sandwich structures and sandwich shell theory, the book provides the knowledge

needed to analyze, design, and optimize various sandwich structures. As one would expect from a book on sandwich structures, this volume discusses special failure modes such as face wrinkling and core shear instability. Coverage includes not only honeycomb cores, but also foam, web, and truss cores. An important topic in composite structure design, optimization is explored in two chapters on sandwich plates and sandwich shells. The author presents the optimization techniques in closed form and the methods are applicable to material selection and geometric design. The book also contains a set of problems and references at the end of each chapter. This text is ideal for engineers-in-training, as well as practical engineers who desire a comprehensive understanding of sandwich structures technology.

Handbook of Materials Behavior Models, Three-Volume Set Jan 20 2022 This first of a kind reference/handbook deals with nonlinear models and properties of material. In the study the behavior of materials' phenomena no unique laws exist. Therefore, researchers often turn to models to determine the properties of materials. This will be the first book to bring together such a comprehensive collection of these models. The Handbook deals with all solid materials, and is organized first by phenomena. Most of the materials models presented in an applications-oriented fashion, less descriptive and more practitioner-geared, making it useful in the daily working activities of professionals. The Handbook is divided into three volumes. Volume I, Deformation of Materials, introduces general methodologies in the art of modeling, in choosing materials, and in the "so-called" size effect. Chapters 2-5 deal respectively with elasticity and viscoelasticity, yield limit, plasticity, and visco-plasticity. Volume II, Failures in Materials, provides models on such concerns as continuous damage, cracking and fracture, and friction wear. Volume III, Multiphysics Behavior, deals with multiphysics coupled behaviors. Chapter's 10 and 11 are devoted to special classes of materials (composites, biomaterials, and geomaterials). The different sections within each chapter describe one model each with its domain of validity, its background, its formulation, the identification of material parameters for as many materials as possible, and advice on how to implement or use the model. The study of the behavior of materials, especially solids, is related to hundreds of areas in engineering design and control. Predicting how a material will perform under various conditions is essential to determining the optimal performance of machines and vehicles and the structural integrity of buildings, as well as safety issues. Such practical examples would be how various new materials, such as those used in new airplane hulls, react to heat or cold or sudden temperature changes, or how new building materials hold up under extreme earthquake conditions. The Handbook of Materials Behavior Models: Gathers together 117 models of behavior of materials written by the most eminent specialists in their field Presents each model's domain of validity, a short background, its formulation, a methodology to identify the materials parameters, advise on how to use it in practical applications as well as extensive references Covers all solid materials: metals, alloys, ceramics, polymers, composites, concrete, wood, rubber, geomaterials such as rocks, soils, sand, clay, biomaterials, etc Concerns all engineering phenomena: elasticity, viscoelasticity, yield limit, plasticity, viscoplasticity, damage, fracture, friction, and wear

Mechanical Behavior of Biomaterials Apr 30 2020 Mechanical Behaviour of Biomaterials focuses on the interface between engineering and medicine, where new insights into engineering aspects will prove to be extremely useful in their relation to the biomedical sciences and their applications. The book's main objective focuses on the mechanical behavior of biomaterials, covering key aspects, such as mechanical properties, characterization and performance. Particular emphasis is given to fatigue, creep and wear, fracture, and stress and strain relationships in biomaterials. Chapters look at both experimental and theoretical results. Readers will find this to be an essential reference for academics, biomechanical researchers, medical doctors, biologists, chemists, physicists, mechanical, biomedical and materials engineers and industrial professionals. Presents contributions from international experts Provides insights at the interface of disciplines, such as engineering and the medical and dental sciences Presents a comprehensive understanding on the mechanical properties of biomaterials Covers surface and bulk properties

Mechanical Behavior of Materials Jun 24 2022
Mechanical Behavior of Materials May 12 2021
Mechanical Behavior of Materials Mar 22 2022 This textbook supports a range of core courses in undergraduate materials and mechanical engineering curricula given at leading universities globally. It presents fundamentals and quantitative analysis of mechanical behavior of materials covering engineering mechanics and materials, deformation behavior, fracture mechanics, and failure design. This book provides a holistic understanding of mechanical behavior of materials, and enables critical thinking through mathematical modeling and problem solving. Each of the 15 chapters first introduces readers to the technologic importance of the topic and provides basic concepts with diagrammatic illustrations; and then its engineering analysis/mathematical modelling along with calculations are presented. Featuring 200 end-of-chapter calculations/worked examples, 120 diagrams, 260 equations on mechanics and materials, the text is ideal for students of mechanical, materials, structural, civil, and aerospace engineering.
The Mechanical Behavior of Materials X Dec 27 2019 Volume is indexed by Thomson Reuters CPCI-S (WoS). The objective of this collection was to gather together the latest information on the mechanical behavior of materials. The volumes cover the progress made in all aspects of the mechanical behavior of materials, seen from both the macroscopic and microscopic viewpoints.
Mechanical Behavior of Materials Jul 26 2022 Covers stress-strain equations, mechanical testing, yielding and fracture under stress, fracture of cracked members, and fatigue of materials.
Mechanical Behaviour of Engineering Materials Jul 14 2021 How do engineering materials deform when bearing mechanical loads? To answer this crucial question, the book bridges the gap between continuum mechanics and materials science. The different kinds of material deformation are explained in detail. The book also discusses the physical processes occurring during the deformation of all classes of engineering materials and shows how these materials can be strengthened to meet the design requirements. It provides the knowledge needed in selecting the appropriate engineering material for a certain design problem. This book is both a valuable textbook and a useful reference for graduate students and practising engineers.
Mechanical Behavior and Fracture of Engineering Materials Apr 10 2021 This book presents the theoretical concepts of stress and strain, as well as the strengthening and fracture mechanisms of engineering materials in an accessible level for non-expert readers, but without losing scientific rigor. This volume fills the gap between the specialized books on mechanical behavior, physical metallurgy and material science and engineering books on strength of materials, structural design and materials failure. Therefore it is intended for college students and practicing engineers that are learning for the first time the mechanical behavior and failure of engineering materials or wish to deepen their understanding on these topics. The book includes specific topics seldom covered in other books, such as: how to determine a state of stress, the relation between stress definition and mechanical design, or the theory behind the methods included in industrial standards to assess defects or to determine fatigue life. The emphasis is put into the link between scientific knowledge and practical applications, including solved problems of the main topics, such as stress and strain calculation. Mohr's Circle, yield criteria, fracture mechanics, fatigue and creep life prediction. The volume covers both the original findings in the field of mechanical behavior of engineering materials, and the most recent and widely accepted theories and techniques applied to this topic. At the beginning of some selected topics that by the author's judgement are transcendental for this field of study, the prime references are given, as well as a brief biographical semblance of those who were the pioneers or original contributors. Finally, the intention of this book is to be a textbook for undergraduate and graduate courses on Mechanical Behavior, Mechanical Metallurgy and Materials Science, as well as a consulting

and/or training material for practicing engineers in industry that deal with mechanical design, materials selection, material processing, structural integrity assessment, and for researchers that incursion for the first time in the topics covered in this book.
Dynamic Behavior of Materials May 24 2022 Addresses fundamentals and advanced topics relevant to the behavior of materials under in-service conditions such as impact, shock, stress and high-strain rate deformations. Deals extensively with materials from a microstructure perspective which is the future direction of research today.
Inelastic Behavior of Materials and Structures Under Monotonic and Cyclic Loading Feb 06 2021 This book presents studies on the inelastic behavior of materials and structures under monotonic and cyclic loads. It focuses on the description of new effects like purely thermal cycles or cases of non-trivial damages. The various models are based on different approaches and methods and scaling aspects are taken into account. In addition to purely phenomenological models, the book also presents mechanisms-based approaches. It includes contributions written by leading authors from a host of different countries.
Mechanical Behavior of Engineering Materials Jan 08 2021 This monograph consists of two volumes and provides a unified, comprehensive presentation of the important topics pertaining to the understanding and determination of the mechanical behaviour of engineering materials under different regimes of loading. The large subject area is separated into eighteen chapters and four appendices, all self-contained, which give a complete picture and allow a thorough understanding of the current status and future direction of individual topics. Volume I contains eight chapters and three appendices, and concerns itself with the basic concepts pertaining to the entire monograph, together with the response behaviour of engineering materials under static and quasi-static loading. Thus, Volume I is dedicated to the introduction, the basic concepts and principles of the mechanical response of engineering materials, together with the relevant analysis of elastic, elastic-plastic, and viscoelastic behaviour. Volume II consists of ten chapters and one appendix, and concerns itself with the mechanical behaviour of various classes of materials under dynamic loading, together with the effects of local and microstructural phenomena on the response behaviour of the material. Volume II also contains selected topics concerning intelligent material systems, and pattern recognition and classification methodology for the characterization of material response states. The monograph contains a large number of illustrations, numerical examples and solved problems. The majority of chapters also contain a large number of review problems to challenge the reader. The monograph can be used as a textbook in science and engineering, for third and fourth undergraduate levels, as well as for the graduate levels. It is also a definitive reference work for scientists and engineers involved in the production, processing and applications of engineering materials, as well as for other professionals who are involved in the engineering design process.
Dynamic Behavior of Materials, Volume 1 Mar 10 2021 Dynamic Behavior of Materials, Volume 1 of the Proceedings of the 2020 SEM Annual Conference & Exposition on Experimental and Applied Mechanics, the first volume of seven from the Conference, brings together contributions to this important area of research and engineering. The collection presents early findings and case studies on fundamental and applied aspects of Experimental Mechanics, including papers on: Synchrotron Applications/Advanced Dynamic Imaging Quantitative Visualization of Dynamic Events Novel Experimental Techniques Dynamic Behavior of Geomaterials Dynamic Failure & Fragmentation Dynamic Response of Low Impedance Materials Hybrid Experimental/Computational Studies Shock and Blast Loading Advances in Material Modeling Industrial Applications
Mechanical Behavior of Materials Sep 15 2021 For upper-level undergraduate and graduate level engineering courses in Mechanical Behavior of Materials. Predicting the mechanical behavior of materials Mechanical Behavior of Materials, 5th Edition introduces the spectrum of mechanical behavior of materials and covers the topics of deformation, fracture, and fatigue. The text emphasizes practical engineering methods for testing structural materials to obtain their properties, predicting their strength and life, and avoiding structural failure when used for machines, vehicles,

and structures. With its logical treatment and ready-to-use format, the text is ideal for upper-level undergraduate students who have completed an elementary mechanics of materials course. The 5th Edition features many improvements and updates throughout including new or revised problems and questions, and a new chapter on Environmentally Assisted Cracking.

Mechanical Behavior of Materials Nov 29 2022 This is a textbook on the mechanical behavior of materials for mechanical and materials engineering. It emphasizes quantitative problem solving. This new edition includes treatment of the effects of texture on properties and microstructure in Chapter 7, a new chapter (12) on discontinuous and inhomogeneous deformation, and treatment of foams in Chapter 21.

DISLOCATIONS AND MECHANICAL BEHAVIOUR OF MATERIALS Jul 02 2020 Primarily intended for the senior undergraduate and postgraduate students of Metallurgical and Materials Engineering/Mechanical Engineering, the book begins with the description of elementary mechanical testing method and then moves on to the theory of elasticity, the micromechanics of high strain rate deformation phenomenon and quantitative methods of materials selection. Dislocation and their applications is the strength of this book. The topics such as creep, fatigue and fracture are comprehensively covered. The final chapter presents the principles of materials selection. The book contains numerous solved and unsolved examples to reinforce the understanding of the subject.

Elements of Metallurgy and Engineering Alloys Nov 17 2021 This practical reference provides thorough and systematic coverage on both basic metallurgy and the practical engineering aspects of metallic material selection and application.

Mechanical Behavior of Materials Apr 22 2022

Viscoelastic Behavior of Rubbery Materials Sep 03 2020 The enormous size of polymer molecules causes their molecular motions to span a broad range of length scales and give rise to viscoelastic behaviour. This rate-dependence of the properties is a predominant characteristic of soft materials (rubbers, biopolymers, lubricants, adhesives, etc.). Improving the performance and developing new applications for soft materials require an understanding of the basic principles of how molecular motions underlie physical properties. This text is intended to provide grounding in fundamental aspects of the dynamic behavior of rubbery materials, adopting a molecular perspective in its treatment to emphasize how microscopic processes are connected to the observed macroscopic behavior. The latest discoveries and advances in the science and technology of rubbery materials are described and critically analyzed.

Mechanical Behavior of Materials Aug 15 2021 Publisher Description

Statics and Mechanics of Structures Dec 31 2022 The statics and mechanics of structures form a core aspect of civil engineering. This book provides an introduction to the subject, starting from classic hand-calculation types of analysis and gradually advancing to a systematic form suitable for computer implementation. It starts with statically determinate structures in the form of trusses, beams and frames. Instability is discussed in the form of the column problem - both the ideal column and the imperfect column used in actual column design. The theory of statically indeterminate structures is then introduced, and the force and deformation methods are explained and illustrated. An important aspect of the book’s approach is the systematic development of the theory in a form suitable for computer implementation using finite elements. This development is supported by two small computer programs, MiniTruss and MiniFrame, which permit static analysis of trusses and frames, as well as linearized stability analysis. The book’s final section presents related strength of materials subjects in greater detail; these include stress and strain, failure criteria, and normal and shear stresses in general beam flexure and in beam torsion. The book is well-suited as a textbook for a two-semester introductory course on structures.

Deformation and Fracture Behaviour of Polymer Materials Jan 26 2020 This book covers the most recent advances in the deformation and

fracture behaviour of polymer material. It provides deeper insight into related morphology–property correlations of thermoplastics, elastomers and polymer resins. Each chapter of this book gives a comprehensive review of state-of-the-art methods of materials testing and diagnostics, tailored for plastic pipes, films and adhesive systems as well as elastomeric components and others. The investigation of deformation and fracture behaviour using the experimental methods of fracture mechanics has been the subject of intense research during the last decade. In a systematic manner, modern aspects of fracture mechanics in the industrial application of polymers for bridging basic research and industrial development are illustrated by multifarious examples of innovative materials usage. This book will be of value to scientists, engineers and in polymer materials science.