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C9D96M - GROSS HARTMAN

Although there are several books in print dealing with elasticity, many focus on specialized topics such as mathematical foundations, anisotropic materials, two-dimensional problems, thermoelasticity, non-linear theory, etc. As such they are not appropriate candidates for a general textbook. This book provides a concise and organized presentation and development of general theory of elasticity. This text is an excellent book teaching guide. Contains exercises for student engagement as well as the integration and use of MATLAB Software Provides development of common solution methodologies and a systematic review of analytical solutions useful in applications of

Text for advanced undergraduates and graduate students features numerous problems with complete answers. Topics include torsion, rotating disks, membrane stresses in shells, bending of flat plates, more. 1952 edition.

I am very much aware that it is an act of extreme rashness to attempt to write an elementary book about structures. Indeed it is only when the subject is stripped of its mathematics that one begins to realize how difficult it is to pin down and describe those structural concepts which are often called 'elementary'; by which I suppose we mean 'basic' or 'fundamental'. Some of the omissions and oversimplifications are intentional but no doubt some of them are due to my own brute ignorance and lack of understanding of the subject. Although this volume is more or less a sequel to *The New Science of Strong Materials* it can be read as an entirely separate book in its own right. For this reason a certain amount of repetition has been unavoidable in the earlier chapters. I have to thank a great many people for factual information, suggestions and for stimulating and sometimes heated discussions. Among the living, my colleagues at Reading University have been gener-

ous with help, notably Professor W. D. Biggs (Professor of Building Technology), Dr Richard Chaplin, Dr Giorgio Jeronimidis, Dr Julian Vincent and Dr Henry Blyth; Professor Anthony Flew, Professor of Philosophy, made useful suggestions about the last chapter. I am also grateful to Mr John Bartlett, Consultant Neurosurgeon at the Brook Hospital. Professor T. P. Hughes of the University of the West Indies has been helpful about rockets and many other things besides. My secretary, Mrs Jean Collins, was a great help in times of trouble. Mrs Nethercot of Vogue was kind to me about dress-making. Mr Gerald Leach and also many of the editorial staff of Penguins have exercised their accustomed patience and helpfulness. Among the dead, I owe a great deal to Dr Mark Pryor - lately of Trinity College, Cambridge - especially for discussions about biomechanics which extended over a period of nearly thirty years. Lastly, for reasons which must surely be obvious, I owe a humble oblation to Herodotus, once a citizen of Halicarnassus.

This new edition of J. E. Gordon's classic introduction to the properties of materials used in engineering answers some fundamental and fascinating questions about how the material world around us functions. In particular, Gordon focuses on so-called strong materials, such as metals, wood, ceramics, glass, and bone. For each material in question, Gordon explains the unique physical and chemical basis for its inherent structural qualities in irrepressibly fresh and simple terms. He also shows how an in-depth understanding of these materials' intrinsic strengths (and weaknesses) guides our engineering choices, allowing us to build the structures that support our modern society. Philip Ball's new introduction describes Gordon's career and the impact of his innovations in materials research, while also discussing how the field has evolved since Gordon wrote this enduring example of first-rate scientific communication.

Provides an introduction to numerical methods for students in en-

gineering. It uses Python 3, an easy-to-use, high-level programming language.

* Each chapter is written by one or more invited world-renowned experts * Information provided in handy reference tables and design charts * Numerous examples demonstrate how the theory outlined in the book is applied in the design of structures Tremendous strides have been made in the last decades in the advancement of offshore exploration and production of minerals. This book fills the need for a practical reference work for the state-of-the-art in offshore engineering. All the basic background material and its application in offshore engineering is covered. Particular emphasis is placed in the application of the theory to practical problems. It includes the practical aspects of the offshore structures with handy design guides, simple description of the various components of the offshore engineering and their functions. The primary purpose of the book is to provide the important practical aspects of offshore engineering without going into the nitty-gritty of the actual detailed design. · Provides all the important practical aspects of ocean engineering without going into the 'nitty-gritty' of actual design details· · Simple to use - with handy design guides, references tables and charts· · Numerous examples demonstrate how theory is applied in the design of structures

Engineers need to be familiar with the fundamental principles and concepts in materials and structures in order to be able to design structures to resist failures. For 4 decades, this book has provided engineers with these fundamentals. Thoroughly updated, the book has been expanded to cover everything on materials and structures that engineering students are likely to need. Starting with basic mechanics, the book goes on to cover modern numerical techniques such as matrix and finite element methods. There is also additional material on composite materials, thick shells, flat plates and the vibrations of complex structures. Illustrated

throughout with worked examples, the book also provides numerous problems for students to attempt. New edition introducing modern numerical techniques, such as matrix and finite element methods Covers requirements for an engineering undergraduate course on strength of materials and structures

The Maritime Engineering Reference Book is a one-stop source for engineers involved in marine engineering and naval architecture. In this essential reference, Anthony F. Molland has brought together the work of a number of the world's leading writers in the field to create an inclusive volume for a wide audience of marine engineers, naval architects and those involved in marine operations, insurance and other related fields. Coverage ranges from the basics to more advanced topics in ship design, construction and operation. All the key areas are covered, including ship flotation and stability, ship structures, propulsion, seakeeping and maneuvering. The marine environment and maritime safety are explored as well as new technologies, such as computer aided ship design and remotely operated vehicles (ROVs). Facts, figures and data from world-leading experts makes this an invaluable ready-reference for those involved in the field of maritime engineering. Professor A.F. Molland, BSc, MSc, PhD, CEng, FRINA. is Emeritus Professor of Ship Design at the University of Southampton, UK. He has lectured ship design and operation for many years. He has carried out extensive research and published widely on ship design and various aspects of ship hydrodynamics. * A comprehensive overview from best-selling authors including Bryan Barrass, Rawson and Tupper, and David Eyres * Covers basic and advanced material on marine engineering and Naval Architecture topics * Have key facts, figures and data to hand in one complete reference book

Young engineers are often required to utilize commercial finite element software without having had a course on finite element theory. That can lead to computer-aided design errors. This book outlines the basic theory, with a minimum of mathematics, and how its phases are structured within a typical software. The importance of estimating a solution, or verifying the results, by other means is emphasized and illustrated. The book also demonstrates the common processes for utilizing the typical graphical icon interfaces in commercial codes. In particular, the book uses and covers the widely utilized SolidWorks solid modeling and simulation system to demonstrate applications in heat transfer, stress analy-

sis, vibrations, buckling, and other fields. The book, with its detailed applications, will appeal to upper-level undergraduates as well as engineers new to industry.

This volume is a thorough introduction to contemporary research in elasticity, and may be used as a working textbook at the graduate level for courses in pure or applied mathematics or in continuum mechanics. It provides a thorough description (with emphasis on the nonlinear aspects) of the two competing mathematical models of three-dimensional elasticity, together with a mathematical analysis of these models. The book is as self-contained as possible.

This best-selling textbook presents the concepts of continuum mechanics, and the second edition includes additional explanations, examples and exercises.

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.

The most complete single-volume treatment of classical elasticity, this text features extensive editorial apparatus, including a historical introduction. Topics include stress, strain, bending, torsion, gravitational effects, and much more. 1927 edition.

The essence of continuum mechanics- the internal response of materials to external loading- is often obscured by the complex mathematics of its formulation. By building gradually from one-dimensional to two- and three-dimensional formulations, this book provides an accessible introduction to the fundamentals of solid and fluid mechanics, covering s

The Mechanics and Thermodynamics of Continua presents a unified treatment of continuum mechanics and thermodynamics

that emphasises the universal status of the basic balances and the entropy imbalance. These laws are viewed as fundamental building blocks on which to frame theories of material behaviour. As a valuable reference source, this book presents a detailed and complete treatment of continuum mechanics and thermodynamics for graduates and advanced undergraduates in engineering, physics and mathematics. The chapters on plasticity discuss the standard isotropic theories and, in addition, crystal plasticity and gradient plasticity.

This is the 11th Volume in the series Memorial Tributes compiled by the National Academy of Engineering as a personal remembrance of the lives and outstanding achievements of its members and foreign associates. These volumes are intended to stand as an enduring record of the many contributions of engineers and engineering to the benefit of humankind. In most cases, the authors of the tributes are contemporaries or colleagues who had personal knowledge of the interests and the engineering accomplishments of the deceased. Through its members and foreign associates, the Academy carries out the responsibilities for which it was established in 1964. Under the charter of the National Academy of Sciences, the National Academy of Engineering was formed as a parallel organization of outstanding engineers. Members are elected on the basis of significant contributions to engineering theory and practice and to the literature of engineering or on the basis of demonstrated unusual accomplishments in the pioneering of new and developing fields of technology. The National Academies share a responsibility to advise the federal government on matters of science and technology. The expertise and credibility that the National Academy of Engineering brings to that task stem directly from the abilities, interests, and achievements of our members and foreign associates, our colleagues and friends, whose special gifts we remember in this book.

Designed to meet the needs of undergraduate students, "Introduction to Biomechanics" takes the fresh approach of combining the viewpoints of both a well-respected teacher and a successful student. With an eye toward practicality without loss of depth of instruction, this book seeks to explain the fundamental concepts of biomechanics. With the accompanying web site providing models, sample problems, review questions and more, Introduction to Biomechanics provides students with the full range of instructional material for this complex and dynamic field.

This algebra-based text is designed specifically for Engineering Technology students, using both SI and US Customary units. All example problems are fully worked out with unit conversions. Unlike most textbooks, this one is updated each semester using student comments, with an average of 80 changes per edition.

MECHANICS OF MATERIALS BRIEF EDITION by Gere and Goodno presents thorough and in-depth coverage of the essential topics required for an introductory course in Mechanics of Materials. This user-friendly text gives complete discussions with an emphasis on need to know material with a minimization of nice to know content. Topics considered beyond the scope of a first course in the subject matter have been eliminated to better tailor the text to the introductory course. Continuing the tradition of hallmark clarity and accuracy found in all 7 full editions of Mechanics of Materials, this text develops student understanding along with analytical and problem-solving skills. The main topics include analysis and design of structural members subjected to tension, compression, torsion, bending, and more. How would you briefly describe this book and its package to an instructor? What problems does it solve? Why would an instructor adopt this book? Important Notice: Media content referenced within the product description or the product text may not be available in the ebook version.

This lively textbook differs from others on the subject by its usefulness as a conceptual and mathematical preparation for the study of quantum mechanics, by its emphasis on a variety of learning tools aimed at fostering the student's self-awareness of learning, and by its frequent connections to current research.

The refined theory of beams, which takes into account both rotary inertia and shear deformation, was developed jointly by Timoshenko and Ehrenfest in the years 1911-1912. In over a century since the theory was first articulated, tens of thousands of studies have been performed utilizing this theory in various contexts. Likewise, the generalization of the Timoshenko-Ehrenfest beam theory to plates was given by Uflyand and Mindlin in the years 1948-1951. The importance of these theories stems from the fact that beams and plates are indispensable, and are often occurring elements of every civil, mechanical, ocean, and aerospace structure. Despite a long history and many papers, there is not a single book that summarizes these two celebrated theories. This book is dedicated to closing the existing gap within the literature. It also deals extensively with several controversial topics, namely those

of priority, the so-called 'second spectrum' shear coefficient, and other issues, and shows vividly that the above beam and plate theories are unnecessarily overcomplicated. In the spirit of Einstein's dictum, 'Everything should be made as simple as possible but not simpler,' this book works to clarify both the Timoshenko-Ehrenfest beam and Uflyand-Mindlin plate theories, and seeks to articulate everything in the simplest possible language, including their numerous applications. This book is addressed to graduate students, practicing engineers, researchers in their early career, and active scientists who may want to have a different look at the above theories, as well as readers at all levels of their academic or scientific career who want to know the history of the subject. The Timoshenko-Ehrenfest Beam and Uflyand-Mindlin Plate Theories are the key reference works in the study of stocky beams and thick plates that should be given their due and remain important for generations to come, since classical Bernoulli-Euler beam and Kirchhoff-Love theories are applicable for slender beams and thin plates, respectively. Related Link(s)

The Structural Engineer's Pocket Book British Standards Edition is the only compilation of all tables, data, facts and formulae needed for scheme design to British Standards by structural engineers in a handy-sized format. Bringing together data from many sources into a compact, affordable pocketbook, it saves valuable time spent tracking down information needed regularly. This second edition is a companion to the more recent Eurocode third edition. Although small in size, this book contains the facts and figures needed for preliminary design whether in the office or on-site. Based on UK conventions, it is split into 14 sections including geotechnics, structural steel, reinforced concrete, masonry and timber, and includes a section on sustainability covering general concepts, materials, actions and targets for structural engineers.

This classic text combines the scholarly insights of its distinguished author with the practical, problem-solving orientation of an experienced industrial engineer. Abundant examples and figures, plus 233 problems and answers. 1956 edition.

Fundamentals of Machine Component Design presents a thorough introduction to the concepts and methods essential to mechanical engineering design, analysis, and application. In-depth coverage of major topics, including free body diagrams, force flow concepts, failure theories, and fatigue design, are coupled with specific applications to bearings, springs, brakes, clutches, fasteners,

and more for a real-world functional body of knowledge. Critical thinking and problem-solving skills are strengthened through a graphical procedural framework, enabling the effective identification of problems and clear presentation of solutions. Solidly focused on practical applications of fundamental theory, this text helps students develop the ability to conceptualize designs, interpret test results, and facilitate improvement. Clear presentation reinforces central ideas with multiple case studies, in-class exercises, homework problems, computer software data sets, and access to supplemental internet resources, while appendices provide extensive reference material on processing methods, joinability, failure modes, and material properties to aid student comprehension and encourage self-study.

Elasticity in Engineering Mechanics has been prized by many aspiring and practicing engineers as an easy-to-navigate guide to an area of engineering science that is fundamental to aeronautical, civil, and mechanical engineering, and to other branches of engineering. With its focus not only on elasticity theory, including nano- and biomechanics, but also on concrete applications in real engineering situations, this acclaimed work is a core text in a spectrum of courses at both the undergraduate and graduate levels, and a superior reference for engineering professionals.

Developed from the authors, combined total of 50 years undergraduate and graduate teaching experience, this book presents the finite element method formulated as a general-purpose numerical procedure for solving engineering problems governed by partial differential equations. Focusing on the formulation and application of the finite element method through the integration of finite element theory, code development, and software application, the book is both introductory and self-contained, as well as being a hands-on experience for any student. This authoritative text on Finite Elements: Adopts a generic approach to the subject, and is not application specific. In conjunction with a web-based chapter, it integrates code development, theory, and application in one book. Provides an accompanying Web site that includes ABAQUS Student Edition, Matlab data and programs, and instructor resources. Contains a comprehensive set of homework problems at the end of each chapter. Produces a practical, meaningful course for both lecturers, planning a finite element module, and for students using the text in private study. Accompanied by a book companion website housing supplementary material that can be

found at <http://www.wileyeurope.com/college/Fish> A First Course in Finite Elements is the ideal practical introductory course for junior and senior undergraduate students from a variety of science and engineering disciplines. The accompanying advanced topics at the end of each chapter also make it suitable for courses at graduate level, as well as for practitioners who need to attain or refresh their knowledge of finite elements through private study.

Written by world-renowned authorities on mechanics, this classic ranges from theoretical explanations of 2- and 3-D stress and strain to practical applications such as torsion, bending, and thermal stress. 1961 edition.

Solid Mechanics: A Variational Approach, Augmented Edition presents a lucid and thoroughly developed approach to solid mechanics for students engaged in the study of elastic structures not seen in other texts currently on the market. This work offers a clear and carefully prepared exposition of variational techniques as they are applied to solid mechanics. Unlike other books in this field, Dym and Shames treat all the necessary theory needed for the study of solid mechanics and include extensive applications. Of particular note is the variational approach used in developing consistent structural theories and in obtaining exact and approximate solutions for many problems. Based on both semester and year-long courses taught to undergraduate seniors and graduate students, this text is geared for programs in aeronautical, civil, and mechanical engineering, and in engineering science. The au-

thors' objective is two-fold: first, to introduce the student to the theory of structures (one- and two-dimensional) as developed from the three-dimensional theory of elasticity; and second, to introduce the student to the strength and utility of variational principles and methods, including briefly making the connection to finite element methods. A complete set of homework problems is included.

This is the 21st Volume in the series Memorial Tributes compiled by the National Academy of Engineering as a personal remembrance of the lives and outstanding achievements of its members and foreign associates. These volumes are intended to stand as an enduring record of the many contributions of engineers and engineering to the benefit of humankind. In most cases, the authors of the tributes are contemporaries or colleagues who had personal knowledge of the interests and the engineering accomplishments of the deceased. Through its members and foreign associates, the Academy carries out the responsibilities for which it was established in 1964. Under the charter of the National Academy of Sciences, the National Academy of Engineering was formed as a parallel organization of outstanding engineers. Members are elected on the basis of significant contributions to engineering theory and practice and to the literature of engineering or on the basis of demonstrated unusual accomplishments in the pioneering of new and developing fields of technology. The National Academies share a responsibility to advise the federal government on mat-

ters of science and technology. The expertise and credibility that the National Academy of Engineering brings to that task stem directly from the abilities, interests, and achievements of our members and foreign associates, our colleagues and friends, whose special gifts we remember in this book.

Fluids -- Heat transfer -- Thermodynamics -- Mechanical seals -- Pumps and compressors -- Drivers -- Gears -- Bearings -- Piping and pressure vessels -- Tribology -- Vibration -- Materials -- Stress and strain -- Fatigue -- Instrumentation -- Engineering economics. 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.