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Fatigue and Fracture Jun 27 2019 "This book emphasizes the physical and practical aspects of fatigue and fracture. It covers mechanical properties of materials, differences between ductile and brittle fractures, fracture mechanics, the basics of fatigue, structural joints, high temperature failures, wear, environmentally-induced failures, and steps in the failure analysis process."--publishers website.

Engineering Mechanics of Solids Sep 30 2019

[Introduction to Mechanics of Solids](#) Mar 05 2020

Geotechnical Characterization and Modelling Sep 22 2021 This volume comprises select papers presented during the Indian Geotechnical Conference 2018, discussing issues and challenges relating to the characterization of geomaterials, modelling approaches, and geotechnical engineering education. With a combination of field studies, laboratory experiments and modelling approaches, the chapters in this volume address some of the most widely investigated geotechnical engineering topics. This volume will be of interest to researchers and practitioners alike.

Mechanical Sciences Nov 05 2022 This introductory textbook covers the fundamentals of engineering mechanics (solid mechanics and fluid mechanics) and thermodynamics. The solid mechanics chapters cover the basic topics on statics, dynamics, and strength of materials. The fluid mechanics chapters deal with elementary aspects of fluid at rest and in motion. The last chapters discuss thermodynamic principles. The contents include solved examples in an attempt to clarify the topics.

[Micro and Smart Systems: Technology and Modeling](#) Apr 29 2022 Microsystems are systems that integrate, on a chip or a package, one or more of many different categories of microdevices. As the past few decades were dominated by the development and rapid miniaturization of circuitry, the current and coming decades are witnessing a similar revolution in the miniaturization of sensors, actuators, and electronics; and communication, control and power devices. Applications ranging from biomedicine to warfare are driving rapid innovation and growth in the field, which is pushing this topic into graduate and undergraduate curricula in electrical, mechanical, and biomedical engineering.

[Automotive Transmissions](#) Feb 25 2022 This book gives a full account of the development process for automotive transmissions. Main topics: - Overview of the traffic – vehicle – transmission system - Mediating the power flow in vehicles - Selecting the ratios - Vehicle transmission systems - basic design principles - Typical designs of vehicle transmissions - Layout and design of important components, e.g. gearshifting mechanisms, moving-off elements, pumps, retarders - Transmission control units - Product development process, Manufacturing technology of vehicle transmissions, Reliability and testing The book covers manual, automated manual and automatic transmissions as well as continuously variable transmissions and hybrid drives for passenger cars and commercial vehicles. Furthermore, final drives, power take-offs and transfer gearboxes for 4-WD-vehicles are considered. Since the release of the first edition in 1999 there have been a lot of changes in the field of vehicles and transmissions. About 40% of the second edition’s content is new or revised with new data.

[Fracture Mechanics for Modern Engineering Design](#) Dec 14 2020 Fracture is a natural reaction of solids to relieve stress and shed excess energy. The fragility of solids is a constant threat to our survival as we drive over a bridge, go through a tunnel, or even inside a building. This book weaves together the essential concepts underlying fracture mechanics.

[Atmospheric and Space Flight Dynamics](#) May 19 2021 This book offers a unified presentation that does not discriminate between atmospheric and space flight. It demonstrates that the two disciplines have evolved from the same set of physical principles and introduces a broad range of critical concepts in an accessible, yet mathematically rigorous presentation. The book presents many MATLAB and Simulink-based numerical examples and real-world simulations. Replete with illustrations, end-of-chapter exercises, and selected solutions, the work is primarily useful as a textbook for advanced undergraduate and beginning graduate-level students.

[FLUID MECHANICS](#) Jan 15 2021 Fluid Mechanics has transformed from fundamental subject to application-oriented subject. Over the years, numerous experts introduced number of books on the theme. Majority of them are rather theoretical with numerical problems and derivations. However, due to increase in computational facilities and availability of MATLAB and equivalent software tools, the subject is also transforming into computational perspective. We firmly believe that this new dimension will greatly benefit present generation students. The present book is an effort to tackle the subject in MATLAB environment and consists of 16 chapters. The book can support undergraduate students in fluid mechanics, and can also be referred to as a text/reference book. KEY FEATURES • Explanation of Fluid Mechanics in MATLAB in structured and lucid manner • 161 Example Problems supported by corresponding MATLAB codes compatible with 2016a version • 162 Exercise Problems for reinforced learning • 12 MP4 Videos for the demonstration of MATLAB codes for effective understanding while enhancing thinking ability of readers • A Question Bank containing 261 Representative Questions and 120 Numerical Problems TARGET AUDIENCE Students of B.E/B.Tech and AMIE (Civil, Mechanical and Chemical Engineering) & Useful to students preparing for GATE and UPSC examinations.

[Engineering Mechanics](#) Oct 04 2022 Engineering Mechanics is designed to serve as a textbook for a single-semester undergraduate course on Engineering Mechanics. Beginning with a review of vector algebra and Newton’s laws, the book goes on to cover concepts of statics, such as equilibrium of bodies, plane trusses, friction, and the method of virtual work. This is followed by an extensive discussion of topics in dynamics, including momentum, work and energy, rotational dynamics, and harmonic oscillators. Written in an easy-to-understand manner, the book includes a large number of solved examples which illustrate problem-solving methodology. It contains an extensive set of end-of-chapter exercises. Both solved and unsolved problems show a good gradation of difficulty levels. A summary at the end of each chapter reviews the key concepts discussed.

[Fluid Mechanics and Its Applications](#) Jul 21 2021

Introduction to Machining Science Dec 02 2019 About the Book: This book is an attempt to consolidate the basic scientific studies in the machining area so that fundamental mechanics and other concepts related to primary machining processes could be understood. The book is essentially designed for senior undergraduate mechanical and production engineering students but practicing engineers will also find it useful for tool and product design. The topics covered include plastic deformation, chip formation, tool geometry, mechanics of orthogonal and oblique cutting, measurement of cutting force, cutting temperature, tool wear and tool life, economics of machining, grinding of metals and machining vibrations. The analyses presented have been illustrated through numerical examples. Review questions and bibliography are also included. About the Author: Dr. G.K. Lal has been associated with the Indian Institute of Technology, Kanpur for the past 34 years. He retired as a Professor of Mechanical Engineering in 2003 and had earlier held the positions of Dean (1976-80) and Deputy Director (1982-88). Before joining IIT Kanpur he had taught at the Banaras Hindu University and held research positions at the University of Sherbrooke (Canada) and the Carnegie-Mellon University (USA). He also worked as a Design Engineer with the Abitibi Paper and Power Corp. of Canada.

[Digital Photoelasticity](#) Sep 03 2022 A straightforward introduction to basic concepts and methodologies for digital photoelasticity, providing a foundation on which future researchers and students can develop their own ideas. The book thus promotes research into the formulation of problems in digital photoelasticity and the application of these techniques to industries. In one volume it provides data acquisition by DIP techniques, its analysis by statistical techniques, and its presentation by computer graphics plus the use of rapid prototyping technologies to speed up the entire process. The book not only presents the various techniques but also provides the relevant time-tested software codes. Exercises designed to support and extend the treatment are found at the end of each chapter.

Statics and Dynamics Jan 27 2022

Manufacturing Engineering Oct 24 2021 This book presents selected proceedings of the International Conference on Production and Industrial Engineering (CPIE) 2018. Focusing on recent developments in the field of production and manufacturing engineering, it provides solutions to wide-ranging contemporary problems in manufacturing engineering and other allied areas using analytical models and the latest numerical approaches. The topics covered in this book include conventional and non conventional machining, casting, welding, materials and processing. As such it is useful to academics, researchers and practitioners working in the field of manufacturing and production engineering.

Special Theory of Relativity Jul 09 2020 The Special Theory of Relativity (STR) is the physical theory of measurement in inertial frames of reference proposed by Albert Einstein. It is deemed special because the theory or principle of relativity is applied only to inertial frames. In this books, Prof Ghatak sets out and explains the basic physics behind Einstein’s theory, and at the same time he gives the reader a concise, enthusiastic overview of Einstein’s massive contribution to science and the knowledge of mankind. In 1999, Time Magazine names Albert Einstein as "The Person of the Century." This book tells us why. The introduction deals with a summary of Einstein’s work, Chapter One discusses Time Dilation and Length Contraction, Chapter Two deals with Mass-energy Relationship and Lorentz Transformations, and Chapters Three and Four reproduce two of his original ground breaking papers from 1905. "Special Theory of Relativity" can be read by physics and engineering undergraduates as a support text on their courses, but it is of equal interest to readers of general science and fans of Albert Einstein.

[Construction in Geotechnical Engineering](#) Feb 13 2021 This volume comprises select papers presented during the Indian Geotechnical Conference 2018. This volume discusses construction challenges and issues in geotechnical engineering. The contents cover foundation design and analysis, issues related to geotechnical structures, including dams, retaining walls, embankments and pavements, and rock mechanics and construction in rocks and rocky environments. Many of the papers discuss live case studies related to important geotechnical engineering projects worldwide, providing useful insights into the realistic designs and constructions. This volume will be of interest to students, researchers and practitioners alike.

Engineering Mechanics of Composite Materials Apr 05 2020

Intelligent Mechatronic Systems May 07 2020 Acting as a support resource for practitioners and professionals looking to advance their understanding of complex mechatronic systems, Intelligent Mechatronic Systems explains their design and recent developments from first principles to practical applications. Detailed descriptions of the mathematical models of complex mechatronic systems, developed from fundamental physical relationships, are built on to develop innovative solutions with particular emphasis on physical model-based control strategies. Following a concurrent engineering approach, supported by industrial case studies, and drawing on the practical experience of the authors, Intelligent Mechatronic Systems covers range of topic and includes: An explanation of a common graphical tool for integrated design and its uses from modeling and simulation to the control synthesis Introductions to key concepts such as different means of achieving fault tolerance, robust overwhelming control and force and impedance control Dedicated chapters for advanced topics such as multibody dynamics and micro-electromechanical systems, vehicle mechatronic systems, robot kinematics and dynamics, space robotics and intelligent transportation systems Detailed discussion of cooperative environments and reconfigurable systems Intelligent Mechatronic Systems provides control, electrical and mechanical engineers and researchers in industrial automation with a means to design practical, functional and safe intelligent systems.

Elasticity for Engineers Aug 22 2021 Covers the basic principles - and the corresponding accompanying mathematical expressions - involved in the theory of elasticity, along with applications to a large variety of problems in civil engineering. It also includes a comprehensive range of worked examples and problems for students to consolidate their understanding of the fundamental principles and illustrate their application in practical situations.

Advanced Machining Processes Oct 31 2019

[Mathematical Methods in Engineering](#) Jun 07 2020 This book collects chapters dealing with some of the theoretical aspects needed to properly discuss the dynamics of complex engineering systems. The book illustrates advanced theoretical development and new techniques designed to better solve problems

within the nonlinear dynamical systems. Topics covered in this volume include advances on fixed point results on partial metric spaces, localization of the spectral expansions associated with the partial differential operators, irregularity in graphs and inverse problems, Hyers-Ulam and Hyers-Ulam-Rassias stability for integro-differential equations, fixed point results for mixed multivalued mappings of Feng-Liu type on Mb-metric spaces, and the limit q-Bernstein operators, analytical investigation on the fractional diffusion absorption equation.

Introduction to Aircraft Flight Mechanics Aug 10 2020 Suitable for use in undergraduate aeronautical engineering curricula, this title is written for those first encountering the topic by clearly explaining the concepts and derivations of equations involved in aircraft flight mechanics. It also features insights about the A-10 based upon the author's career experience with this aircraft.

Springer Handbook of Experimental Solid Mechanics May 31 2022 As a reference book, the Springer Handbook provides a comprehensive exposition of the techniques and tools of experimental mechanics. An informative introduction to each topic is provided, which advises the reader on suitable techniques for practical applications. New topics include biological materials, MEMS and NEMS, nanoindentation, digital photomechanics, photoacoustic characterization, and atomic force microscopy in experimental solid mechanics. Written and compiled by internationally renowned experts in the field, this book is a timely, updated reference for both practitioners and researchers in science and engineering.

Advanced Soil Mechanics, Second Edition Jul 01 2022 This revised edition is restructured with additional text and extensive illustrations, along with developments in geotechnical literature. Among the topics included are: soil aggregates, stresses in soil mass, pore water pressure due to undrained loading, permeability and seepage, consolidation, shear strength of soils, and evaluation of soil settlement. The text presents mathematical derivations as well as numerous worked-out examples.

Topology Optimization Jul 29 2019 The topology optimization method solves the basic engineering problem of distributing a limited amount of material in a design space. The first edition of this book has become the standard text on optimal design which is concerned with the optimization of structural topology, shape and material. This edition, has been substantially revised and updated to reflect progress made in modelling and computational procedures. It also encompasses a comprehensive and unified description of the state-of-the-art of the so-called material distribution method, based on the use of mathematical programming and finite elements. Applications treated include not only structures but also materials and MEMS.

Fundamentals of Metal Machining and Machine Tools Oct 12 2020 In the more than 15 years since the second edition of Fundamentals of Machining and Machine Tools was published, the industry has seen many changes. Students must keep up with developments in analytical modeling of machining processes, modern cutting tool materials, and how these changes affect the economics of machining. With coverage reflecting s

elements of nonequilibrium statistical mechanics Sep 10 2020

Computer Aided Engineering Design Nov 12 2020 A new discipline is said to attain maturity when the subject matter takes the shape of a textbook. Several textbooks later, the discipline tends to acquire a firm place in the curriculum for teaching and learning. Computer Aided Engineering Design (CAED), barely three decades old, is interdisciplinary in nature whose boundaries are still expanding. However, it draws its core strength from several acknowledged and diverse areas such as computer graphics, differential geometry, Boolean algebra, computational geometry, topological spaces, numerical analysis, mechanics of solids, engineering design and a few others. CAED also needs to show its strong linkages with Computer Aided Manufacturing (CAM). As is true with any growing discipline, the literature is widespread in research journals, edited books, and conference proceedings. Various textbooks have appeared with different biases, like geometric modeling, computer graphics, and CAD/CAM over the last decade. This book goes into mathematical foundations and the core subjects of CAED without allowing itself to be overshadowed by computer graphics. It is written in a logical and thorough manner for use mainly by senior and graduate level students as well as users and developers of CAD software. The book covers (a) The fundamental concepts of geometric modeling so that a real understanding of designing synthetic surfaces and solid modeling can be achieved. (b) A wide spectrum of CAED topics such as CAD of linkages and machine elements, finite element analysis, optimization. (c) Application of these methods to real world problems.

Theory of Mechanisms and Machines Aug 29 2019

Engineering Mechanics | AICTE Prescribed Textbook - English Aug 02 2022 Engineering Mechanics with Lab Manual is a compulsory for the first year Diploma course in Engineering 7 Technology. Syllabus of this book is strictly align as per model curriculum of AICTE and academic content is amalgamated with the concept of Outcome based Education (OBE). Book covers is five units- Basic mechanics & force system, Equilibrium, Friction, Centroid and Centre of gravity & simple lifting machine. Each unit written in every easy, systematic and orderly manner. Each unit contains a set of exercise at the end of each unit to test the student's comprehension. Also in each unit the laboratory practical pertaining to unit is included. Some salient features of the book: 1 Content of the book aligned with the mapping of Course Outcomes, Programs Outcomes and Unit Outcomes. 1 Book provides lots of recent information, interesting facts, QR Code for E-resources, QR Code for use of ICT, projects, group discussion etc. 1 Student and teacher centric subject materials included in book with balanced and chronological manner. 1 Figures, tables, equations and activities are insert to improve clarity of the topics. 1 Objective questions, Short questions and long answer exercise given for practice of students after every unit. 1 Solved and unsolved problems including numerical examples taken with systematic steps.

FLUID MECHANICS Mar 17 2021 The third edition of this easy-to-understand text continues to provide students with a sound understanding of the fundamental concepts of various physical phenomena of science of fluid mechanics. It adds a new chapter (Vortex Theory) which presents a vivid interpretation of vortex motions that are of fundamental importance in aerodynamics and in the performance of many other engineering devices. It elaborately explains the dynamics of vortex motion with the help of Helmholtz's theorems and provides illustrations of how the manifestations of Helmholtz's theorems can be observed in daily life. Several new problems along with answers are added at the end of Chapter 4 on Boundary Layer. The book is suitable for a one-semester course in fluid mechanics for undergraduate students of mechanical, aerospace, civil and chemical engineering students. A Solutions Manual containing solutions to end-of-chapter problems is available for use by instructors.

Computational Continuum Mechanics Nov 24 2021 An updated and expanded edition of the popular guide to basic continuum mechanics and computational techniques This updated third edition of the popular reference covers state-of-the-art computational techniques for basic continuum mechanics modeling of both small and large deformations. Approaches to developing complex models are described in detail, and numerous examples are presented demonstrating how computational algorithms can be developed using basic continuum mechanics approaches. The integration of geometry and analysis for the study of the motion and behaviors of materials under varying conditions is an increasingly popular approach in continuum mechanics, and absolute nodal coordinate formulation (ANCF) is rapidly emerging as the best way to achieve that integration. At the same time, simulation software is undergoing significant changes which will lead to the seamless fusion of CAD, finite element, and multibody system computer codes in one computational environment. Computational Continuum Mechanics, Third Edition is the only book to provide in-depth coverage of the formulations required to achieve this integration. Provides detailed coverage of the absolute nodal coordinate formulation (ANCF), a popular new approach to the integration of geometry and analysis Provides detailed coverage of the floating frame of reference (FFR) formulation, a popular well-established approach for solving small deformation problems Supplies numerous examples of how complex models have been developed to solve an array of real-world problems Covers modeling of both small and large deformations in detail Demonstrates how to develop computational algorithms using basic continuum mechanics approaches Computational Continuum Mechanics, Third Edition is designed to function equally well as a text for advanced undergraduates and first-year graduate students and as a working reference for researchers, practicing engineers, and scientists working in computational mechanics, bio-mechanics, computational biology, multibody system dynamics, and other fields of science and engineering using the general continuum mechanics theory.

Engineering Fluid Mechanics Apr 17 2021 Engineering Fluid Mechanics guides students from theory to application, emphasizing critical thinking, problem solving, estimation, and other vital engineering skills. Clear, accessible writing puts the focus on essential concepts, while abundant illustrations, charts, diagrams, and examples illustrate complex topics and highlight the physical reality of fluid dynamics applications. Over 1,000 chapter problems provide the “deliberate practice”—with feedback—that leads to material mastery, and discussion of real-world applications provides a frame of reference that enhances student comprehension. The study of fluid mechanics pulls from chemistry, physics, statics, and calculus to describe the behavior of liquid matter; as a strong foundation in these concepts is essential across a variety of engineering fields, this text likewise pulls from civil engineering, mechanical engineering, chemical engineering, and more to provide a broadly relevant, immediately practicable knowledge base. Written by a team of educators who are also practicing engineers, this book merges effective pedagogy with professional perspective to help today's students become tomorrow's skillful engineers.

Advanced Mechanics of Solids Dec 26 2021

Introduction to Fluid Mechanics and Fluid Machines Feb 02 2020

Vibrations and Waves in Continuous Mechanical Systems Jun 19 2021 The subject of vibrations is of fundamental importance in engineering and technology. Discrete modelling is sufficient to understand the dynamics of many vibrating systems; however a large number of vibration phenomena are far more easily understood when modelled as continuous systems. The theory of vibrations in continuous systems is crucial to the understanding of engineering problems in areas as diverse as automotive brakes, overhead transmission lines, liquid filled tanks, ultrasonic testing or room acoustics. Starting from an elementary level, Vibrations and Waves in Continuous Mechanical Systems helps develop a comprehensive understanding of the theory of these systems and the tools with which to analyse them, before progressing to more advanced topics. Presents dynamics and analysis techniques for a wide range of continuous systems including strings, bars, beams, membranes, plates, fluids and elastic bodies in one, two and three dimensions. Covers special topics such as the interaction of discrete and continuous systems, vibrations in translating media, and sound emission from vibrating surfaces, among others.

Develops the reader's understanding by progressing from very simple results to more complex analysis without skipping the key steps in the derivations. Offers a number of new topics and exercises that form essential steppingstones to the present level of research in the field. Includes exercises at the end of the chapters based on both the academic and practical experience of the authors. Vibrations and Waves in Continuous Mechanical Systems provides a first course on the vibrations of continuous systems that will be suitable for students of continuous system dynamics, at senior undergraduate and graduate levels, in mechanical, civil and aerospace engineering. It will also appeal to researchers developing theory and analysis within the field.

Engineers Black Book Jan 03 2020 "This easy-to-use pocket book contains a wealth of up-to-date, useful, practical and hard-to-find information. With 160 matt laminated, greaseproof pages you'll enjoy glare-free reading and durability. Includes: data sheets, formulae, reference tables and equivalent charts. New content in the 3rd edition includes; Reamer and Drill Bit Types, Taper Pins, T-slot sizing, Counterboring/Sinking, Extended Angles Conversions for Cutting Tapers, Keyways and Keyseats, Woodruff Keys, Retaining Rings, O-Rings, Flange Sizing, Common Workshop Metals, Adhesives, GD&T, Graph and Design Paper included at the back of the book. Engineers Black Book contains a wealth of up-to-date, useful, information within over 160 matt laminated grease proof pages. It is ideal for engineers, trades people, apprentices, machine shops, tool rooms and technical colleges." -- publisher website.

Cardiovascular Fluid Mechanics Mar 29 2022 The book presents the state of the art in the interdisciplinary field of fluid mechanics applied to cardiovascular modelling. It is neither a monograph nor a collection of research papers, rather an extended review in the field. It is arranged in 4 scientific chapters each presenting thoroughly the approach of a leading research team; two additional chapters prepared by biomedical scientists present the topic by the applied perspective. A unique feature is a substantial (approx. one fourth of the book) medical introductory part, written by clinical researchers for scientific readers, that would require a large effort to be collected otherwise.