Mechanics Of Solid By R K Rajput

Introduction to Contact Mechanics
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Mechanics of Solids
Computational Fluid and Solid Mechanics 2003
Solid Mechanics in Engineering
Finite Element Computations in Mechanics with R
STRENGTH OF MATERIALS
Localization and Solitary Waves in Solid Mechanics

CARLO HAYDEN

Introduction to Contact Mechanics
Cambridge University Press

This book covers the essential topics for a second-level course in strength of materials or mechanics of materials, with an emphasis on techniques that are useful for mechanical design. Design typically involves an initial conceptual stage during which many options are considered. At this stage, quick approximate analytical methods are crucial in determining which of the initial proposals are feasible. The ideal would be to get within 30% with a few lines of calculation. The designer also needs to develop experience as to the kinds of features in the geometry or the loading that are most likely to lead to critical conditions. With this in mind, the author tries wherever possible to give a physical and even an intuitive interpretation to the problems under investigation. For example, students are encouraged to estimate the location of weak and strong bending axes and the resulting neutral axes of bending before performing calculations, and the author discusses ways of getting good accuracy with a simple one-degree of freedom Rayleigh-Ritz approximation. Students are also encouraged to develop a feeling for structural deformation by performing simple experiments in their outside environment, for example, estimating the radius to which an initially straight bar can be bent without producing permanent deformation, or convincing themselves of the dramatic difference between torsional and bending stiffness for a thin-walled open beam section by trying to bend and then twist a structural steel beam by hand-applied loads at one end. In choosing dimensions for mechanical components, designers will expect to be guided by criteria of minimum weight, which with elementary calculations, generally leads to a thin-walled structure as an optimal solution. This consideration motivates the emphasis on thin-walled structures, but also demands that students be introduced to the limits imposed by structural instability. Emphasis is also placed on the effect of manufacturing errors on such highly-designed structures - for example, the effect of load misalignment on a beam with a large ratio between principal stiffness and the large magnification of initial alignment or loading errors in a strut below, but not too far below the buckling load. Additional material can be found on http://extras.springer.com/

Multiscale Deformation and Fracture in Materials and Structures
Elsevier

Bringing together the world’s leading researchers and practitioners of computational mechanics, these new volumes meet and build on the eight key challenges for research and development in computational mechanics. Researchers have recently identified eight critical research tasks facing the field of computational mechanics. These tasks have come about because it appears possible to reach a new level of mathematical modelling and numerical solution that will lead to a much deeper understanding of nature and to great improvements in engineering design. The eight tasks are: The automatic solution of mathematical models Effective numerical schemes for fluid flows The development of an effective mesh-free numerical solution method The development of numerical procedures for multiphysics problems The development of operational procedures for multiscale problems The modelling of uncertainties The analysis of complete life cycles of systems Education - teaching sound engineering and scientific judgement Readers of Computational Fluid and Solid Mechanics 2003 will be able to apply the combined experience of many of the world’s leading researchers to their own research needs. Those in academic environments will gain a better insight into the needs and constraints of the industries they are involved with; those in industry will gain a competitive advantage by gaining insight into the cutting edge research being carried out by colleagues in academia. Features Bridges the gap between academic researchers and practitioners in industry Outlines the eight main challenges facing Research and Design in Computational mechanics and offers new insights into the shifting the research agenda Provides a vision of how strong, basic and exciting education at university can be harmonized with life-long learning to obtain maximum value from the new powerful tools of analysis

Mathematical Modelling in Solid Mechanics
Springer Science & Business Media

This book comprises select proceedings of the 63rd Congress of the Indian Society of Theoretical and Applied Mechanics (IStAM) held in Bangalore, in December 2018. Latest research in computational, experimental, and applied mechanics is presented in the book. The chapters are broadly classified into two sections - (i) fluid mechanics and (ii) solid mechanics. Each section covers computational and experimental studies on various contemporary topics such as aerospace dynamics and propulsion, atmospheric sciences, boundary layers, compressible flow, environmental fluid dynamics, control structures, fracture and crack, viscoelasticity, and mechanics of composites. The contents of this book will serve as a useful reference to students, researchers, and practitioners interested in the broad field of mechanics.

Solid and Fluid Mechanics Routledge

Very few polymer mechanics problems are solved with only pen and paper today, and virtually all academic research and industrial work relies heavily on finite element simulations and specialized computer software. Introducing and demonstrating the utility of computational tools and simulations, Mechanics of Solid Polymers provides a modern view of how solid polymers behave, how they can be experimentally characterized, and how to predict their behavior in different load environments. Reflecting the significant progress made in the understanding of polymer behaviour over the last two decades, this book will discuss recent developments and compare them to classical theories. The book shows how to best make use of commercially available finite element software to solve polymer mechanics problems, introducing readers to the current state of the art in predicting failure using a combination of experiment and computational techniques. Case studies and example Matlab code are also included. As industry and academia are increasingly reliant on advanced computational mechanics software to implement sophisticated constitutive models - and authoritative information is hard to find in one place - this book provides engineers with what they need to know to make best use of the technology available. Helps professionals deploy the latest experimental polymer testing methods to assess suitability for applications Discusses material models for different polymer types Shows how best to make use of available finite element software to model polymer behaviour, and includes case studies and example code to help engineers and researchers apply it to their work Contact Mechanics Springer

Mechanics of Solids and MaterialsCambridge University Press

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