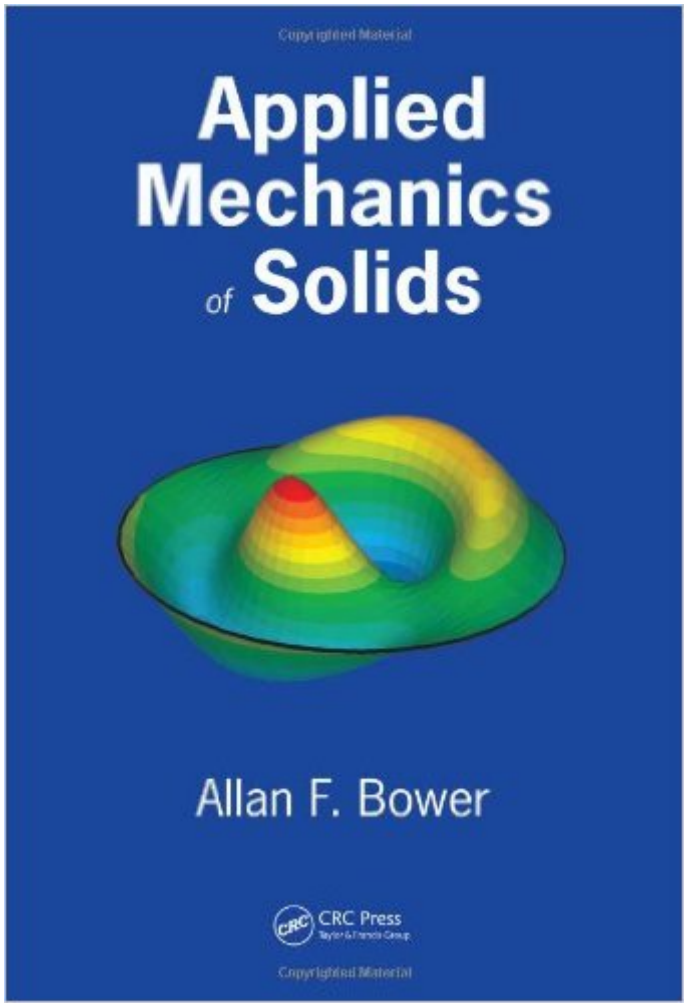
Applied Mechanics Of Solids



Synopsis

Modern computer simulations make stress analysis easy. As they continue to replace classical mathematical methods of analysis, these software programs require users to have a solid understanding of the fundamental principles on which they are based. Develop Intuitive Ability to Identify and Avoid Physically Meaningless Predictions Applied Mechanics of Solids is a powerful tool for understanding how to take advantage of these revolutionary computer advances in the field of solid mechanics. Beginning with a description of the physical and mathematical laws that govern deformation in solids, the text presents modern constitutive equations, as well as analytical and computational methods of stress analysis and fracture mechanics. It also addresses the nonlinear theory of deformable rods, membranes, plates, and shells, and solutions to important boundary and initial value problems in solid mechanics. The author uses the step-by-step manner of a blackboard lecture to explain problem solving methods, often providing the solution to a problem before its derivation is presented. This format will be useful for practicing engineers and scientists who need a quick review of some aspect of solid mechanics, as well as for instructors and students. Select and Combine Topics Using Self-Contained Modules and Subsections Borrowing from the classical literature on linear elasticity, plasticity, and structural mechanics, this book: Introduces concepts, analytical techniques, and numerical methods used to analyze deformation, stress, and failure in materials or components Discusses the use of finite element software for stress analysis Assesses simple analytical solutions to explain how to set up properly posed boundary and initial-value problems Provides an understanding of algorithms implemented in software code Complemented by the authorâ ™s website, which features problem sets and sample code for self study, this book offers a crucial overview of problem solving for solid mechanics. It will help readers make optimal use of commercial finite element programs to achieve the most accurate prediction results possible.

Book Information

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Customer Reviews

This is one of the best concise reference for a wide variety of topics in soild mechanics. The authour covers the most fundamental and important topics and this can be a helpful reference to anyone right from a begineer to advanced level researchers. The Maple and Matlab FEM codes accompanying the chapters are wonderful and illustrate the concepts in a very good way thus encouraging budding researchers to understand those topics by practicing them using an FEM code. A very well written text.

I had Prof. Bower as my primary instructor for a freshman engineering course in dynamics and vibrations, and his clarity in lectures most certainly comes through in this textbook. It covers an absurd range of topics (I've taken graduate level courses in continuum, elasticity, and plasticity since then, and they each cover about as much material as one or two chapters of this book) in great detail as well. Though this book may not be for college students just starting in engineering, I can most certainly recommend it for mechanical engineers at the advanced undergraduate and graduate levels. If you are doing any coursework into the theory of mechanics, don't hesitate to get this; it has been one amazing reference work. After all, there is a reason why engineering professors at some of the top programs in the nation use this text with their courses.

I am using this book to teach a solid mechanics course. The book style is as if someone has put his powerpoint lectures together and made a book. Many important subjects which need to be discussed in detail have been just mentioned in multiple bullets with very short statements. For example, the author does not prove the strain compatibility equations and just mentions them without even discussing intuitively or mathematically why we need those equations. Another example is Von Mises criterion which is not only not proved from shear strain energy point of view but also not well explained and compared to other models such as Tresca's criterion. There are many many other examples as such in this book which I think makes it improper to use as a textbook. The only good thing about the book is the fact that it contains a lot of material and it is very

likely that you can find a formula which you do not remember in it. However, if you do not remember a topic you better look it up in other books.

Bower gives an impressive review of the basic understanding of solid mechanics. In addition if you need a quick overview of the Finite Element procedure this book will undoubtedly increase your understanding.

A great book covering a large range of topics with a good balance of physical and mathematical reasoning. A must have for someone working in computational mechanics.