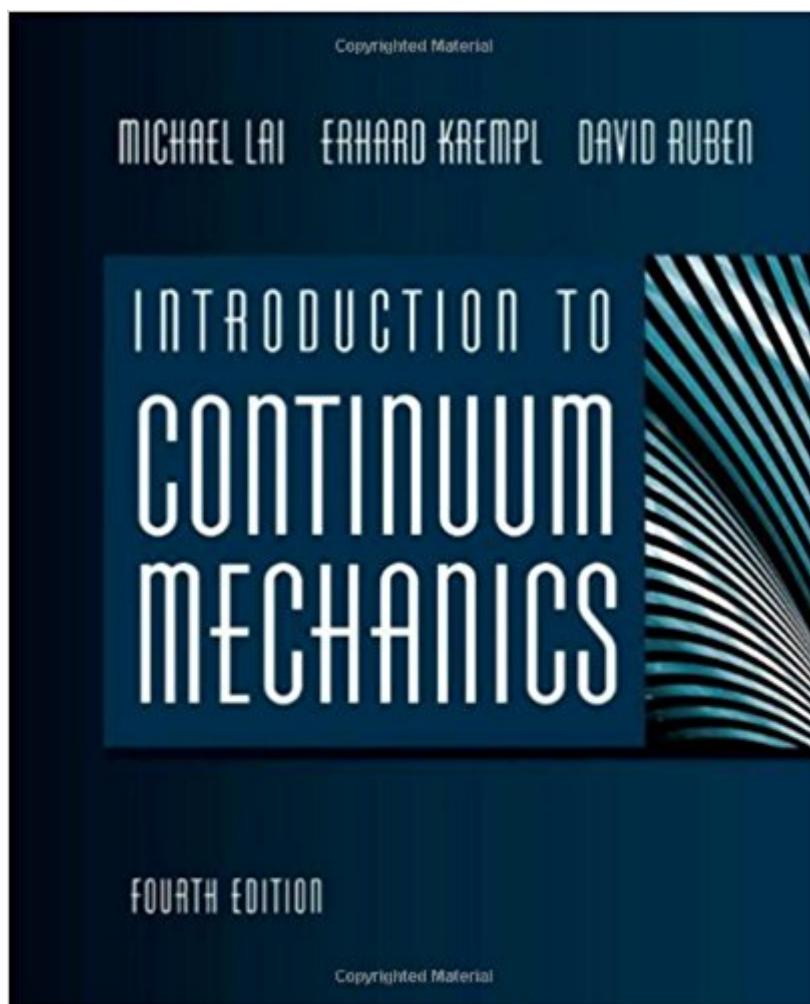


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# Introduction To Continuum Mechanics, Fourth Edition



## Synopsis

Continuum Mechanics is a branch of physical mechanics that describes the macroscopic mechanical behavior of solid or fluid materials considered to be continuously distributed. It is fundamental to the fields of civil, mechanical, chemical and bioengineering. This time-tested text has been used for over 35 years to introduce junior and senior-level undergraduate engineering students, as well as graduate students, to the basic principles of continuum mechanics and their applications to real engineering problems. The text begins with a detailed presentation of the coordinate invariant quantity, the tensor, introduced as a linear transformation. This is then followed by the formulation of the kinematics of deformation, large as well as very small, the description of stresses and the basic laws of continuum mechanics. As applications of these laws, the behaviors of certain material idealizations (models) including the elastic, viscous and viscoelastic materials, are presented. This new edition offers expanded coverage of the subject matter both in terms of details and contents, providing greater flexibility for either a one or two-semester course in either continuum mechanics or elasticity. Although this current edition has expanded the coverage of the subject matter, it nevertheless uses the same approach as that in the earlier editions - that one can cover advanced topics in an elementary way that go from simple to complex, using a wealth of illustrative examples and problems. It is, and will remain, one of the most accessible textbooks on this challenging engineering subject. Significantly expanded coverage of elasticity in Chapter 5, including solutions of some 3-D problems based on the fundamental potential functions approach. New section at the end of Chapter 4 devoted to the integral formulation of the field equations. Seven new appendices appear at the end of the relevant chapters to help make each chapter more self-contained. Expanded and improved problem sets providing both intellectual challenges and engineering applications.

## Book Information

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## Customer Reviews

Professor of Mechanical Engineering and Orthopaedic Bioengineering at Columbia University, New York

This book is great for an introductory course. The examples convey the ideas, the tensor analysis is developed throughout the text but it is not excessive (the good lord knows Tensors can be one or two courses on their own). The problems at the end of the chapter are ALL workable, and each of them makes you use some of the analysis developed. That tells me that the author has been around teaching many, many years, and is really interested in the students gathering a solid understanding of continuum mechanics. This book would be useful for folks that have switched fields (a EE/ME/Aero turned acoustician, or turned Material Scientist), who went through the standard curriculum (continuum mechanics has been historically taught by its own department -say at U of I, you can get a PhD in the field) or in the Aerospace. Once thought a "dead" field - sensors, and smart materials force the folks to either review or learn (like me).

Comparing this book with Spencer's book, this one is definitely better. It is crystal clear. I like the way they divide into small sections, so the content is more organized and easy for me to follow.

started with no knowledge of continuum mechanics and this book laid out a solid and reliable presentation of the material with very beautiful use of tensors. this book has worked for me as a stand-alone source of learning the subject without any prof or use of Utube. I have gone through half of it and noticed just one minor typo. there are good number of examples in the book. I would strongly recommend it to any beginner . I wish it had come with a separate practice book to accompany it.

This is the best text I have been able to find for the course I am teaching at the first year graduate level in Continuum Mechanics. the authors explain the material in excellent detail without a lot of obscure notation and an over emphasis on tensor analysis. I would have given them 5 stars if there

weren't still a few typos in a few of the equations. that always scares me because I do not want to derive the equations every time I use them.

The book is in good condition. There is no problem at all.

Seems to be a very good book, with a lot of example problems. Which helps a lot when trying to work the homework.

Excellent reference for a mind-bogglingly difficult topic.

This book provides a very lucid introduction to continuum mechanics, with a lot of worked out examples to help understanding the somewhat abstract content of this subject. I highly recommend this book to those who learn continuum mechanics for the first time.

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