

BOOK REVIEW

Applied Continuum Mechanics. By T. J. CHUNG. Cambridge University Press, 1996.
252 pp. ISBN 0-521-48297-6. \$49.95 or £30.

This is a revised edition of the book *Continuum Mechanics* published in 1988 by Prentice Hall. The present volume has been shortened by the deletion of certain advanced and specialized topics, the objective being to offer a text that is suitable for undergraduate instruction. There are five chapters: Introduction; Deformations and kinematics; Equilibrium and kinetics; Elastic solids; Newtonian fluids. The last chapter, spanning some 100 pages, covers a formidable variety of flows: ideal, rotational, turbulent, boundary-layer, flows with heat transfer, high-speed aerodynamics, acoustics, and reacting flows.

My reaction to this book was mixed. On the positive side, the organization is good, and the ideas are developed in a sensible order, considering the difficulty of unifying solid and fluid mechanics. Useful collections of formulae are given for ready reference, and I found the decision to discuss solid and fluid mechanics separately but alongside wise. But I discovered several inconsistencies in the order that concepts are introduced, I noticed some cyclic or incomplete definitions, and I agonized over extracting the motivation for much of the analytical machinery. I expect that the average undergraduate student will have similar problems. For example, the novice in continuum mechanics will find it difficult to see why covariant and contravariant coordinates are necessary without explicitly being given a reason for them at the outset. Moreover, statements such as 'In turbulence, the motion appears as if the viscosity were increased tremendously' and similar ones spotted throughout the book make for uneasy reading. The expert on solid or fluid mechanics will understand the meaning behind the respective words, but juxtaposition will raise their eyebrows.

This is a reasonable book to own, but a difficult text from which to learn. A revision based on students' and instructors' critical comments will help smooth the concerns raised in the previous paragraph. The author of this book has used it as a textbook at the University of Alabama, but I would prepare lecture notes and problem sets to go with it.

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