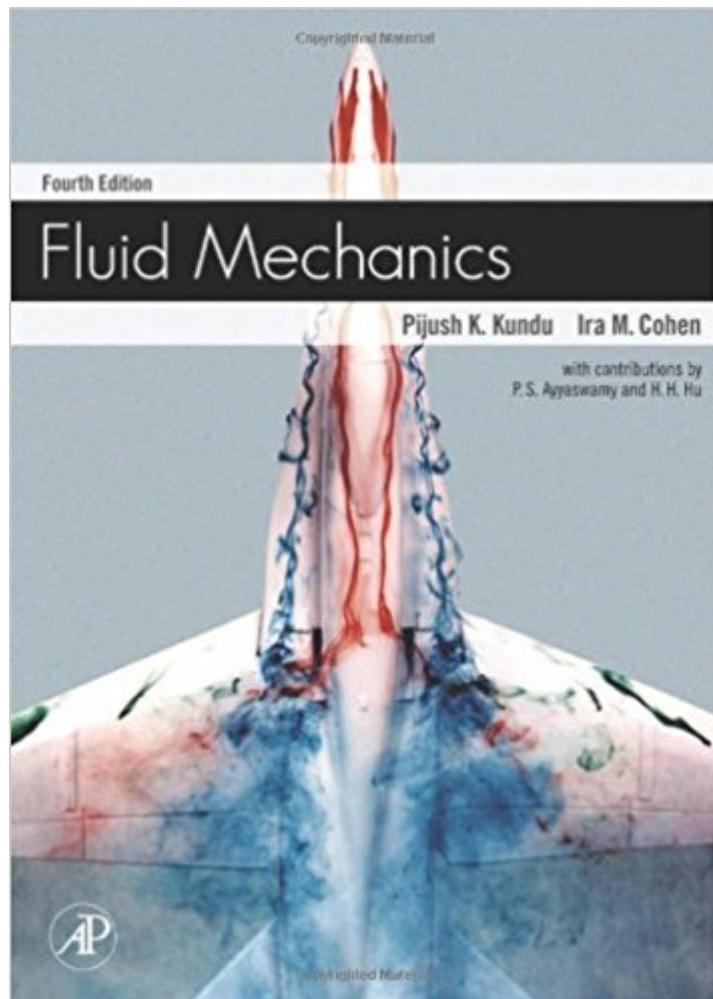


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Fluid Mechanics, Fourth Edition



Synopsis

Fluid Mechanics, Fourth Edition, is a basic yet comprehensive introductory text on the fundamentals of fluid mechanics and applications in engineering and science. It guides students from the fundamentals to the analysis and application of fluid mechanics, including compressible flow and such diverse applications as hydraulics and aerodynamics. This new edition contains updates to several chapters and sections, including Boundary Layers, Turbulence, Geophysical Fluid Dynamics, Thermodynamics and Compressibility. It includes a new chapter on Biofluid Mechanics by Professor Portonovo Ayyaswamy, the Asa Whitney Professor of Dynamical Engineering at the University of Pennsylvania. It provides additional worked-out examples and end-of-chapter problems. The book is recommended for senior undergraduate/graduate students in mechanical, civil, aerospace, chemical and biomedical engineering; physics, chemistry, meteorology, geophysics, and applied mathematics. Updates to several chapters and sections, including Boundary Layers, Turbulence, Geophysical Fluid Dynamics, Thermodynamics and Compressibility. Fully revised and updated chapter on Computational Fluid Dynamics. New chapter on Biofluid Mechanics by Professor Portonovo Ayyaswamy, the Asa Whitney Professor of Dynamical Engineering at the University of Pennsylvania. New Visual Resources appendix provides a list of fluid mechanics films available for viewing online. Additional worked-out examples and end-of-chapter problems.

Book Information

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Customer Reviews

From its genesis, the text has aimed to offer a balanced approach rather than the more narrow coverage of those written for applied mathematicians, or for readers interested exclusively in engineering applications. Even so, the author is cautious about mixing engineering and geophysical fluid dynamics, generally separating them in different chapters. - Book News, June 2004 --This text refers to the Digital edition.

A basic but comprehensive introductory text on the fundamentals of fluid mechanics and applications in engineering and science. --This text refers to the Digital edition.

Imagine a simple concept been explained in such a way that you feel confused, frustrated, and regret reading the book. Well, you will experience these feelings a lot of times when you go through this book. Incomplete explanations; equations and figures have been misreferred; incorrect equations are few things to start with. I strongly suggest not to choose this book.

I bought this book for a class in geophysical fluid dynamics. I have only a little background in fluid mechanics, but I have some experience with partial differential equations and tensor math (mostly electromagnetics). If you are light on tensor math and physics, this is NOT the book to start with. There are other books in tensor math you will need to read and work problems in first. PDEs are a prerequisite, too, so don't take this book lightly. There is a very good review of tensor math and PDEs in the first chapter and appendices, but you will probably need additional references. The problems are challenging, and they range from easy to quite difficult. The math in this book also has a tendency to be terse, but not too sparse (and the author doesn't use the typical math book cliches, 'left as an exercise' or 'proof is trivial'). The chapters cover quite a few topics, from basic fluid motion, Newtonian and Eulerian flow, and turbulence and Reynolds numbers, to a few advanced topics like blood flow in biological systems. This book would be excellent as a reference, since the chapters are well organized, generally thorough and up-to-date. I plan to keep it on my shelf next to my physics and electromagnetics handbooks when I finish my GFD course.

I purchased this book as a replacement for my earlier edition of the same book which was not returned after I loaned it. The edition that I lost was so good that I had to replace it. This edition benefits from the addition of a well structured section on the transport of solids. But is it my imagination or has the humour of Victor Streeter been edited out?

Kundu is my new favorite graduate level fluids text. It is every bit as rigorous as Panton, but Kundu takes a step back to revisit some of the mathematics. He even goes so far as to remind the reader at one point that $i = \sqrt{-1}$. I would have appreciated this as a grad student myself. The section on waves, the wave equation and simplifications to analyze gravity is excellent. It shows his background in Oceanography. His section on potential flow really makes the correlation between the mathematics and the physical intuition necessary to make sense of the mathematics. Overall, I find it to be a rigorous yet readable text.

I found the coverage excellent. I was originally reading another text, but that book left out critical material that makes its presentation fuzzy (which is why I looked at this book instead). This book is excellent in that it builds up all the necessary machinery from first principles and explains things in a way that someone without any prior knowledge in fluids can understand the material.

Good book.

This is the best book for a grad student who wants to start learning the advanced topics in fluid mechanics. This is the best book to read after Munson and is much easier and much more useful than Batchelor. Most of the concepts are very nicely explained and there is a strong emphasis on understanding the physics of each phenomenon. There is an introductory part on continuum mechanics which is very helpful. This book is almost error free although a lot of equations are presented in the book.

This is a good book to begin learning the fundamentals of fluid mechanics in a science point of view.

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