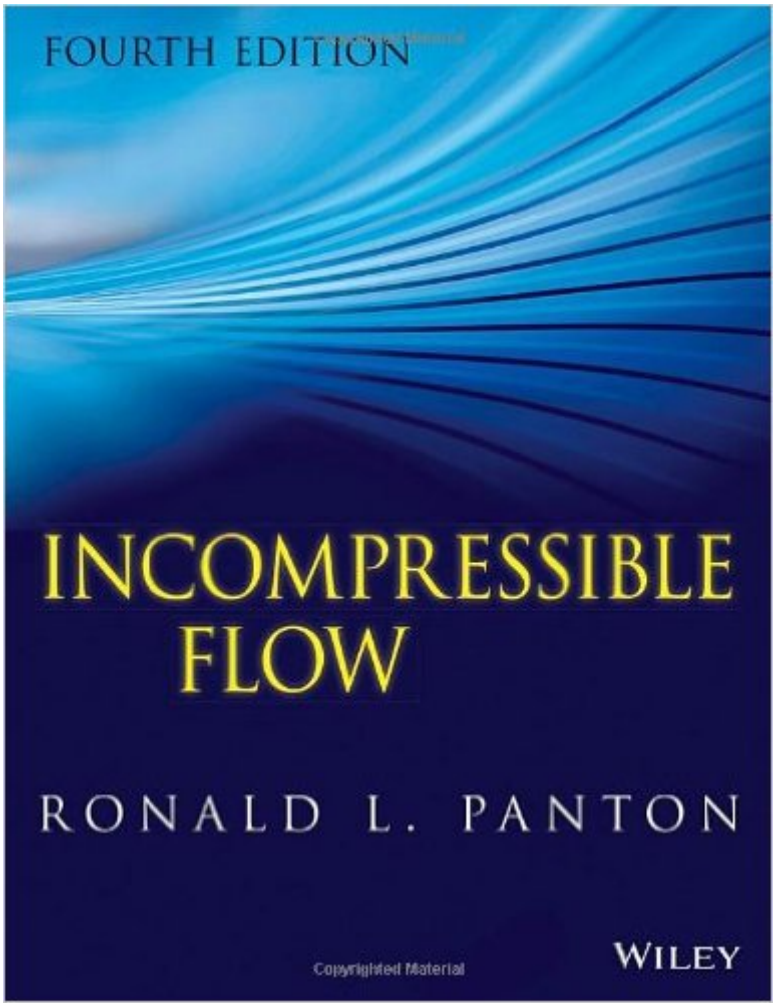
Incompressible Flow



Synopsis

The most teachable book on incompressible flowâ ” now fully revised, updated, and expanded Incompressible Flow, Fourth Edition is the updated and revised edition of Ronald Panton’s classic text. It continues a respected tradition of providing the most comprehensive coverage of the subject in an exceptionally clear, unified, and carefully paced introduction to advanced concepts in fluid mechanics. Beginning with basic principles, this Fourth Edition patiently develops the math and physics leading to major theories. Throughout, the book provides a unified presentation of physics, mathematics, and engineering applications, liberally supplemented with helpful exercises and example problems. Revised to reflect students’ ready access to mathematical computer programs that have advanced features and are easy to use, Incompressible Flow, Fourth Edition includes: Several more exact solutions of the Navier-Stokes equations Classic-style Fortran programs for the Hiemenz flow, the Psi-Omega method for entrance flow, and the laminar boundary layer program, all revised into MATLAB A new discussion of the global vorticity boundary restriction A revised vorticity dynamics chapter with new examples, including the ring line vortex and the Fraenkel-Norbury vortex solutions A discussion of the different behaviors that occur in subsonic and supersonic steady flows Additional emphasis on composite asymptotic expansions Incompressible Flow, Fourth Edition is the ideal coursebook for classes in fluid dynamics offered in mechanical, aerospace, and chemical engineering programs.

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Customer Reviews

This book presents a horrible introduction to graduate level fluid mechanics. Some faculties like to teach from this book because of a few well-written sections near the end of an otherwise disastrous attempt on the subject. Kundu or Currie present a much more comprehensive approach to introducing the wonderful subject of fluids and the different solutions of the Navier-Stokes equations.

The book is OK. You need to have additional books such as book by Rutherford Aris of "vectors, tensors and the basic eqn of fluid mechanics" to completely understand. The objective of why to read this chapter or application of the equations are not mentioned, which makes it very difficult to use it as a reference book.I had to buy this book, because my professor was giving homework from this book. Otherwise, go for better books

This book is an excellent GRADUATE level text book on fluid mechanics. But to benefit from the book, you will first need to have good if not excellent understanding of undergraduate level material. On top of that, you will need to know index notation and perhaps some tesor knowledge from another class. The book only gives a brief review on this. If you are not familar with index notation or 2nd order tensor, the book by Aris is pretty decent. Some other good books are by Currie, White, Bird. But these books are not really good GRADUATE level texts. They are more of a dual level text IMO. And none of those cover as many important topics as this one does. And they try to avoid using tensor. But unfortunately, tensor is one of the most beautiful concepts in continum mechanics. Any text book on continum mechanics avoiding using tensor is at most a dual level text IMO.All books mentioned above have examples with analytical solutions. And some of them are quite mathematical. Most of them have no good connection to real applications. However, you learn critical thinking rather than the knowledge from those examples. So, be ready to sharpen your analytical skills when studying those examples. But do not expect to be able to apply all of them to your real life applications.

The book is great, but FULL of erros. It looks like it never was corrected or edited. There are sign error on equations, missing terms is equations, bad correlation of equation numbers and so on. The overall quality of the book is excellent, but the errors kill it. Luckily the teacher of my class was the author himself so I could ask him and correct the errors as I was reading on. However, if you’re buying this book and the author is not your teacher (most likely), then you’ll run into some anoying troubles.

This is a classic example of engineering math. At sometimes the derivations can become overly explicit and complicated. The benefit is that when you really dive into this method of physical reasoning it is as if you are sitting in an engineering meeting room with a white board. These concepts do not need to be this hard, but when it comes to facing new problems these are the steps that are often skipped or refined before published in a physics text. This is the white board scratch that is so desired by Non-Einsteins like myself. My advisor recommended this text as a guide to getting in the mind set of "experiment possible" concepts. Panton paints every concept in terms that you could intuitively measure, even from the very first chapter with density.

I think this book tries to cover too much. It would be much better if it covered fewer topics, but covered them in more detail, with more development and motivation, and more examples. I often felt that it left me hanging - it would introduce a topic, do one example, and that's it. That doesn't cut it for a graduate level fluids book.

Panton's book is an OK graduate level fluid mechanics text book. Some sections are pretty good (the exact N.S solutions, and potential flow) , and the appendices represent a very good collection of different equations in different coordinate systems.However, there are better graduate level fluid mechanics text books that are much more illustrative and easy to read.I have enjoyed reading many fluid mechanics books(introductory and advanced) , but I did not enjoy reading this one much.All in all, an OK book more suited as a reference .

Overall, not a bad text. Definitely written for engineers, though. Many of the equations are rewritten in different coordinate systems which I found unecessary. In addition, some results are just introduced as fact with much of the mathematical rigor used to derive them left out. The physical arguments and treatment of Exact Solutions to Navier-Stokes are excellent.

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