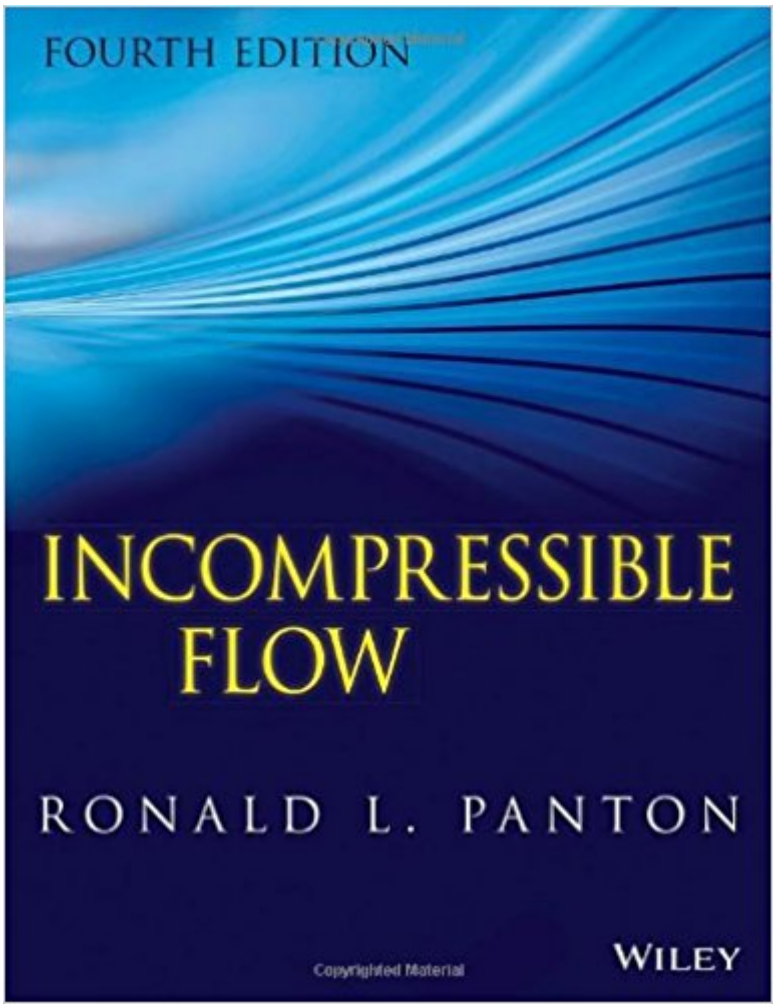
Incompressible Flow



Synopsis

The most teachable book on incompressible flowÃ¢â ¬â • 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

Ã¢â ¬Å“Incompressible Flow, Fourth Edition is the ideal coursebook for classes in fluid dynamics offered in mechanical, aerospace, and chemical engineering programs.Ã¢â ¬Â•Ã Â (Expofairs.com, 28 November 2013)

The most teachable book on incompressible flowÃ¢â ¬â • 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.

I just finished teaching a course with this book, at the recommendation of one of the professors who taught with it before. Every book has its strong points and weaknesses. This one is no exception.The strength of this book is the writing. The written description of the fluid mechanics is great: easy to read and easy to see how each topic applies.The weaknesses of the book are (1) the equations are hard to follow, and (2) the lack of example problems.The equations are fine for someone who already knows the material. And, I hope my students will keep this book for future reference. But, they are difficult for someone seeing the material for the first time. There is a lot of short hand notation for derivatives, index notation, and non-dimensionalization. Those things make the equations more compact, but they kind of hide the physics for someone who is just learning it. For example, omega*t was often replaced with non-dimensional time T. But, I think omega*t has a meaning, and it would be easier to learn the physics if it remained as omega*t in the equation. And,

if all three dimensions were expanded (instead of index notation) it would make it more obvious when assumptions were being made (like 2-D vs 3-D). I guess I really like how the equations are expanded out in some of the classic texts, like Bird, Stewart, and Lightfoot's "Transport Phenomenon" and Schlichting's "Boundary Layer Theory."Personally, I didn't notice the lack of example problems at first, but some of my students mentioned it. And, they were right. Again, that is fine for a reference, after learning the material. But, many people learn best by examples first, then the theory; rather than just diving into the theory.So, overall the book is well written; it would be a good reference book; but it's a little hard to use for someone new to the topic.

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.

This book was hard to follow. Definitely not a book for someone who is seeing the material for the first time. I think Anderson's book is much better.

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 .

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

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.

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