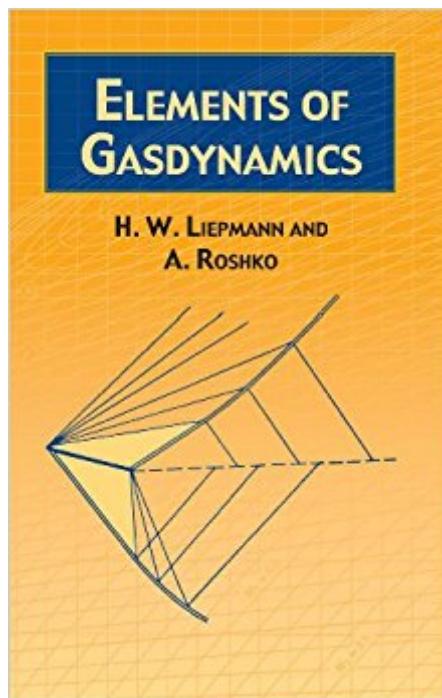


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Elements Of Gas Dynamics (Dover Books On Aeronautical Engineering)



Synopsis

The increasing importance of concepts from compressible fluid flow theory for aeronautical applications makes the republication of this first-rate text particularly timely. Intended mainly for aeronautics students, the text will also be helpful to practicing engineers and scientists who work on problems involving the aerodynamics of compressible fluids. Covering the general principles of gas dynamics to provide a working understanding of the essentials of gas flow, the contents of this book form the foundation for a study of the specialized literature and should give the necessary background for reading original papers on the subject. Topics include introductory concepts from thermodynamics, including entropy, reciprocity relations, equilibrium conditions, the law of mass action and condensation; one-dimensional gasdynamics, one-dimensional wave motion, waves in supersonic flow, flow in ducts and wind tunnels, methods of measurement, the equations of frictionless flow, small-perturbation theory, transonic flow, effects of viscosity and conductivity, and much more. The text includes numerous detailed figures and several useful tables, while concluding exercises demonstrate the application of the material in the text and outline additional subjects. Advanced undergraduate or graduate physics and engineering students with at least a working knowledge of calculus and basic physics will profit immensely from studying this outstanding volume.

Book Information

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Customer Reviews

I used this book to teach myself the basic theory for compressible flow, after focusing on incompressible flow in grad school and having never taken a course on compressible flow. I also got myself a copy of Anderson's Modern Compressible Flow, which I read alongside this text. Since Anderson seems to be one of the more popular texts for the subject, I'll give my thoughts on the two here. I want to say I much preferred this book over Anderson's for two reasons. First, a US edition of Anderson's text costs an order of magnitude more than Liepmann & Roshko (and it certainly isn't an order of magnitude better). Second, L&R is more concise, heavy on derivations, and careful in discussing the physics, while Anderson relies more heavily on example problems. For this reason, I think Anderson is probably more appropriate for an undergrad course, but personally I prefer the former. (If you do want to get Anderson, I recommend the international edition for ~\$30). Anderson also emphasizes more "modern" aspects of compressible flow, such as chemical reactions and CFD. But, despite making a big deal about this in the introduction, he relegates a rather small part of the book to these topics. On the other hand, L&R include almost as much information on the chemical reactions found in hypersonic flows. If this is important to you, I still recommend L&R as a primer on compressible flow theory over Anderson, since it will more quickly prepare you to delve into more specialized texts like Zeldovich & Raizer. The same goes for CFD. Although Anderson discusses computational aspects more than L&R, I think you're better off going from L&R to Toro's text if this is something you care about. That said, I would recommend Anderson's text for certain situations. If you are looking for more of the "flavor" of compressible flows, want to be able to solve a few problems and have the basic idea, but aren't so concerned about understanding all the mathematical nuances and don't plan on moving on to more advanced texts on the subject, get Anderson. Liepmann & Roshko is an excellent part of a flow library, but Anderson is arguably a better one-stop basic reference.

Fantastic overview of gas dynamics. Don't spend the money on a new text book. This one is complete with schlieren photography of experiments. It has been great for teaching and great for a reliable technical reference.

My professor recommends this book for its conciseness and depth. Due to the size of the book, it cannot cover all the details, but I think it covers all the theory well. This is the first book I pull to check some equations/theory for compressible flow. The downside is that there are no example problems, this is purely a reference text (not a learning textbook).

Book as advertised. This was an old text for me back in 1967. Wanted to read it again. Good job. Thanks.

It's just what I wanted for my academics... It covers almost all the topics from my syllabus.

Classic text!!

A classic!

I love it!

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