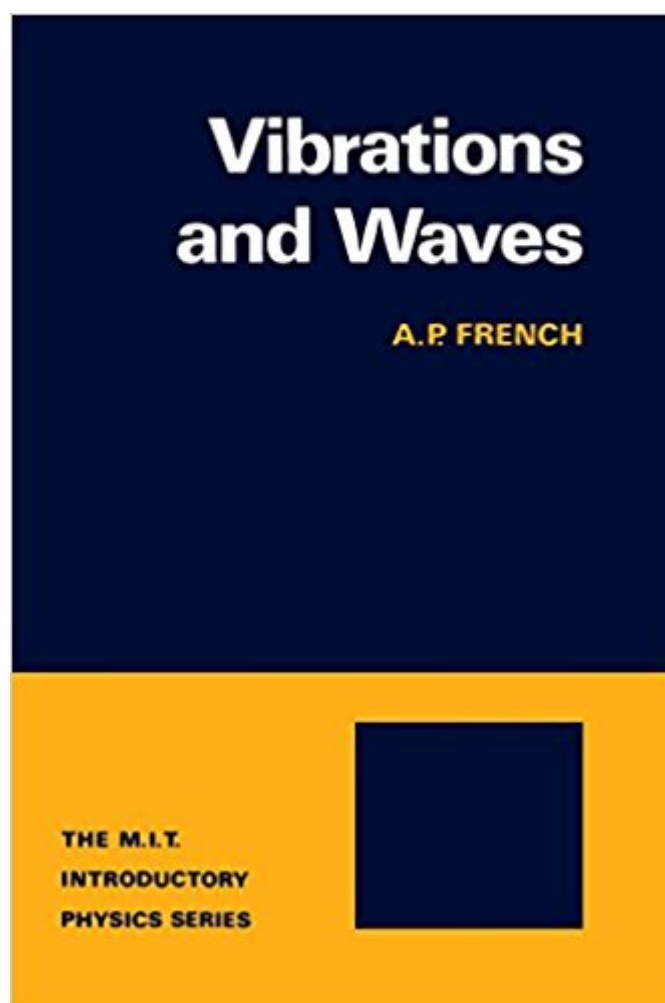


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Vibrations And Waves (M.I.T. Introductory Physics)



Synopsis

The M.I.T. Introductory Physics Series is the result of a program of careful study, planning, and development that began in 1960. The Education Research Center at the Massachusetts Institute of Technology (formerly the Science Teaching Center) was established to study the process of instruction, aids thereto, and the learning process itself, with special reference to science teaching at the university level. Generous support from a number of foundations provided the means for assembling and maintaining an experienced staff to co-operate with members of the Institute's Physics Department in the examination, improvement, and development of physics curriculum materials for students planning careers in the sciences. After careful analysis of objectives and the problems involved, preliminary versions of textbooks were prepared, tested through classroom use at M.I.T. and other institutions, re-evaluated, rewritten, and tried again. Only then were the final manuscripts undertaken.

Book Information

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Customer Reviews

I think the majority of the raving reviews are from professors that have lost touch with what it is like to be learning the material for the first time. There are a lot of assumptions of knowledge that is taken for granted. This is much better than most text books as it does not needlessly go into several pages of equations to explain a concept, words and the critical parts of the derivations are used. The equations flow nicely without skipping the critical steps for understanding. Examples would be nice. Another reviewer mentioned the MIT Open Courseware and another site for examples and

solutions. You definitely need a solid calculus and differential equations understanding to follow along. If you were unfortunate enough to get apathetic graduate student instruction for those courses, you will be in a world of hurt. The paperback is an illegal copy from India. You can see wrinkles and folds in the pages, yet the pages are smooth. Some pages have smudges while others have debris printed on them. Everything is readable, so it seems that they have improved the scanning/printing quality from earlier reviews. The copy page states that it has been published in India by arrangement with W.W. Norton & Co, which I am assuming is the original publisher, but there is a piece of black tape over the words "Sales area: India only". I'm not really complaining as the book was under \$15, but it would have been nice to know what I was getting beforehand (I didn't read the reviews as it was required for part of a course) and I'm sure this violates the publisher's sales policies.

I realize by giving this "classic" a 3 star I'm literally asking to be bashed on. But I think it's only fair to rate a book the way one perceives it. Before I bought the book, I read the reviews here, there were 10 five star reviews and 1 one star review. The latter one (1 star review) was voted not helpful by several users, and I thought it was just some guy trolling. But now that I've bought the book, and actually read it, I see where the guy was coming from. I think he was way too harsh to give it a 1 star rating though. Like the title of this review says, there are no examples in this book, nope none. I dunno how other folks learn Physics but I do by looking at few examples, getting an idea of what's going on, and then trying out some problems on my own. Fortunately, this book does have problems at the end of each chapter...and yes there is an answer key at the end of the book. Also fortunately, there is the internet. Out of frustration, I started googling for university courses that were using this book and I hoped the professor was nice enough to post some examples, practice problem w/ solutions. Luckily there are a few out there. There is MIT OpenCourseWare. You can see solutions to some of the problems that were assigned as a homework in MIT's Vibration and Waves class. Furthermore, they also have documented exams with solutions. University of Michigan also used this book in Physics 340 and they have exams and homework w/ solutions documented online. My professor was selectively teaching from this book, at one point he was in chapter 7 at another he was in chapter 4 and back and forth. So it was a bit of a hassle to look over these webpages and study only those things that I needed. Apart from the fact that this book has no examples, it is everything the 5 star reviewers have said. P.S get yourself *Vibrations and Waves* (M.I.T. Introductory Physics Series) it is 1/2 the price of *Vibrations and Waves* (MIT Introductory Physics Series). P.P.S. *Vibrations and Waves* (Manchester Physics Series) is a 2009 book published by Wiley. It actually has worked out examples. Also, at the end of the book, it provides worked out

solutions (not answer key but solutions) to end of chapter problems. And it covers more or less same topics as this book, preview the table of content for both book and compare for yourself.

I just wish it went through derivations. Explanations are good but it is fairly short and a longer more detailed version would be better in my opinion.

Oscillatory function is at the root of all natural phenomena. Comprehending this behavior as a mathematically pure process is a basis through which countless aspects of the sciences and the arts can be explained, described, and even creatively elaborated upon. The effects of the physical manifestation of waves, and the inevitable complexities resulting from their interaction with the environment, are essential considerations as well. The pages of this work are information-dense, providing physical, geometric, and mathematical descriptions of vibrations. Introducing the sine-wave, vectors and complex-exponentials as the fundamentals of periodic motion, the topics then progress to combining vibrations, masses and springs, harmonic and torsional oscillation, forced vibrations, coupled oscillators, Fourier analysis, orthogonal functions, energy transporting, decay of free vibrations, nuclear and optical resonance, diffraction and interference patterns to briefly name but a few. Physical considerations and methods are discussed in detail as well, and exercises at the end of each chapter indicate what the reader is expected to have extracted from each section [selected answers are provided]. The text within each section is written in an extremely clear, systematic and enthusiastic manner and speaks to an intelligent, inquisitive beginner of the subject matter. The numerous excellent black-and-white illustrations diagrams and photographs supplement the written descriptions admirably. The typefaces and even the feel of the paper of the book are high quality and elegant. This is an introductory work regarding oscillatory analysis, however some mathematical knowledge is assumed by implication. Within the first 15 pages alone are equations which include derivatives, vectors, polar coordinates, complex numbers, and infinite series. It is probably best treated as a supplementary work to an on-going effort in mathematics, the natural sciences, or engineering. Essentially a good foundation in calculus should be sufficient. Given such background so as to understand the crucial mathematics, this work provides an incredible array and range of topics. The preface indicates that this series, by MIT Press, was established to assist in the educational process specifically, and it was tested and evaluated with this objective. As such this book is inherently a supplementary work, and prepares the reader for further research in and comprehension of an incredible range of subjects. Quantum physics, music, human movement, engineering disciplines, the natural sciences, astronomy and more have oscillation as a common

thread and basis of understanding. The mechanics of the vibrational processes underlying all of these are elaborated upon to an amazing level of detail and precision within this work. This book gets my highest recommendation for the focused subject matter it so eloquently and successfully discusses.

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