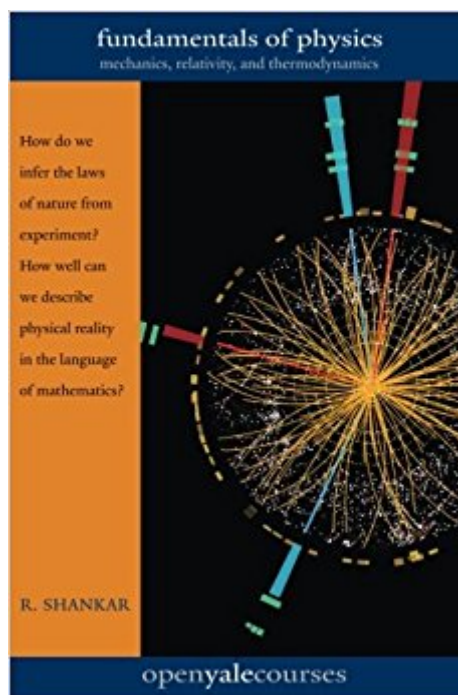




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# Fundamentals Of Physics: Mechanics, Relativity, And Thermodynamics (The Open Yale Courses Series)



## Synopsis

Professor R. Shankar, a well-known physicist and contagiously enthusiastic educator, was among the first to offer a course through the innovative Open Yale Course program. His popular online video lectures on introductory physics have been viewed over a million times. In this concise and self-contained book based on his online Yale course, Shankar explains the fundamental concepts of physics from Galileo's and Newton's discoveries to the twentieth-century's revolutionary ideas on relativity and quantum mechanics. The book begins at the simplest level, develops the basics, and reinforces fundamentals, ensuring a solid foundation in the principles and methods of physics. It provides an ideal introduction for college-level students of physics, chemistry, and engineering, for motivated AP Physics students, and for general readers interested in advances in the sciences. Instructor resources--including problem sets and sample examinations--and more information about Professor Shankar's course are available at <http://oyc.yale.edu/physics/phys-200>.

## Book Information

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## Customer Reviews

"Like his online lectures, Shankar's book looks excellent for teaching and learning introductory physics."—Leonard Susskind, Director, Stanford Institute for Theoretical Physics  
"This introductory text makes easy reading, due to Shankar's great sense of humor and his lucid explanation of the essential ideas of fundamental physics."—David Gross, Nobel Laureate in Physics, 2004  
"Akin to a relaxed

discussion with a masterful tutor, Shankar's book conveys a strong intuitive understanding with wonderful freshness and clarity. A pedagogical masterpiece. — Daniel Arovas, University of California, San Diego

“The book captures, and enhances, the experience of being in the room as Shankar explains the material. This is physics as it should be taught, clearly and entertainingly presented. — Alan Chodos, American Physical Society

“Mechanics, relativity, and thermodynamics are presented with wonderful freshness and clarity by Shankar, who further cements his reputation as a preeminent physics expositor. The presentation is akin to a relaxed discussion with a masterful tutor. With thoughtful explanations and numerous examples, Shankar expertly guides the reader through the subject matter, conveying a strong intuitive understanding reinforced by mathematical analysis. Subtleties and counterintuitive topics such as rotational dynamics, relativity paradoxes, and entropy are patiently and deliberately explained so as to minimize confusion. A pedagogical masterpiece. — Daniel Arovas, University of California, San Diego

R. Shankar is John Randolph Huffman Professor of Physics, Yale University. His popular Open Yale Course “Introduction to Physics” has a major following in the United States, India, Australia, China, and elsewhere. He is the 2009 winner of the American Physical Society's Lilienfeld Prize and the author of two previous textbooks, *Principles of Quantum Mechanics* and *Basic Training in Mathematics: A Fitness Program for Science Students*.

This book is a must-read for anybody interested in learning, or teaching fundamentals of physics. It is based on Professor Shankar's masterfully held course: Fundamentals of Physics I, available at Open Yale Courses website. This book preserves the unique spirit of Professor Shankar's superb teaching style, the style that makes watching his lectures as exciting and pleasurable experience as watching some great movie! Lot of essential material is expertly covered on these 446 pages: Newtonian mechanics, Oscillations, Waves, Fluids, Special Theory of Relativity, Thermodynamics, Statistical Physics, and useful chapters on relevant mathematical methods, as well as many solved examples. The book is extremely readable being stripped of all distractive colorful pictures that burden most of the standard textbooks today. It is written with utmost clarity and with original approach to presenting major topics in physics. As Richard Feynman would put it - no baloney in this book! The text is full of humor, which gives a glimpse of how exciting it is to sit in Prof. Shankar's class. The book is an excellent addition to the recorded course at Open Yale Courses website. The price of the book is very affordable. I hope the second volume, covering Fundamentals

of Physics II, will be published soon too. In short - I highly recommend this unique book, written by one of the greatest living bards of the Art of Physics Teaching!Branislav DjordjevicTerm Associate Professor of PhysicsGeorge Mason University

Greetings! I am a student of philosophy at University of North Texas that digs a lot into scientific topics on my own. I personally own multiple physics textbooks (Feynman lectures, my university's choice textbook, Dover's Theoretical Physics textbook, etc) and this might be the best one for many reasons:-It contains all the information contained in my other textbooks except for the content on electromagnetism (which is the subject of his second series of lectures on Yale's website) and quantum mechanics-It is \$25, the cheapest of all the textbooks I have seen-It is small, lightweight, and only ~430 pages (The feynman lectures are multiple volumes, fragile, and bulky like the university textbook I have)In terms of the presentation, it tops the dover textbooks (which are usually written like they are being presented to 1950's grad students... the equations are difficult to follow and there is little explanation of what is being done. The topics are kind of random and jumbled). It is on par with my university's textbook for presentation, but isnt a giant 10lb monster and has a lot less miscellaneous information that textbooks are notorious for (also, that textbook was almost \$300... granted it contains electromagnetism topics as well). It is hard to compare it to the presentation of the Feynman lectures because of how... unique they are. I would say for a general understanding, the average reader interested in the mathematical physics and a more focused reading would probably prefer Shankar's book.I think the best part is that there are just as many words as equations (with Shankar's humor that he adds in the lecture series that he based this book off of). This DOES require a little bit of pre-requisite mathematical knowledge, but nothing extremely complex (if you understand how to take a derivative and anti derivative and are familiar with the idea of sines and cosines... you will probably be fine. Otherwise, all you will probably need is to watch the lectures on Khan Academy's website for free and you will probably be prepared). This does go a TINY bit into partial differential equations (multivariable calculus) and deals a bit with extremely rudimentary vector geometry (linear algebra material)... but again, anyone with a basic understanding of high-school level algebra who is familiar with rudimentary calculus will be able to follow. Shankar explains everything that he thinks you might not know.As a summary:If you want to learn physics (not just the "facts" like in a Hawking book, but REAL mathematical physics) then this book just about trumps all. The only downside is that this is essentially volume one of what could be a three volume set (2 at least). I first started watching Open Yale Courses back in 2007 as a junior in high school and that has essentially shaped me into who I am today, and this comes directly from

his first series there. He has since done a second series on electromagnetism, and I sincerely hope he also makes that into book just as accessible as this one.

Wonderful elucidation by perhaps the most enjoyable physics lecturer since Feynman. If you've attempted the Feynman Lectures on Physics you've come to assume a dizzying number unexpected gems of insight will jump out at you that completely change your world view; Shankar's gems are less disorienting, but really satisfying and his humor is subtle and lots of fun. I believe that, for each volume of the series, a companion volume with a large number of SOLVED problems to go along with the text would be an invaluable addition and push the ratings to five stars for each. The mathematics volume doesn't really satisfy that need and often takes a little too much for granted with respect to the reader's background. The online lectures are excellent. The Feynman Lectures on Physics, boxed set: The New Millennium Edition Basic Training in Mathematics: A Fitness Program for Science Students

I bought this to go along with his free video courses from the Open Yale Courses. He has presented Physics 200 and 201. The book has instructions to get to those courses. The videos are classroom sessions that follow the book, mostly. The material that comes with the videos include problems sets (and solutions), exams (and solutions) along with extra material. Having the book adds to the richness of the some fifty videos for both Physics 200 and 201. It has been long time since physics classes, so this book and the accompanying videos, are a way to get back into the subject, the math and the new concepts. Not that I have been that successful, but the book does help. I think that it is not that I have forgotten that much (OK, maybe a little), but that there is so much more physics now.

Professor Shankar gives a delightful and elegant presentation to physics in his books. I would recommend viewing his courses on youtube or through YaleCourses.

It's a great book, does not compare to those heavy thousand of pages textbook with indigestible content and clustered derivations filled with pictures of completely unnecessary things, not sure how people are able to read those things. Does not have exercises but really you could find those anywhere.

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