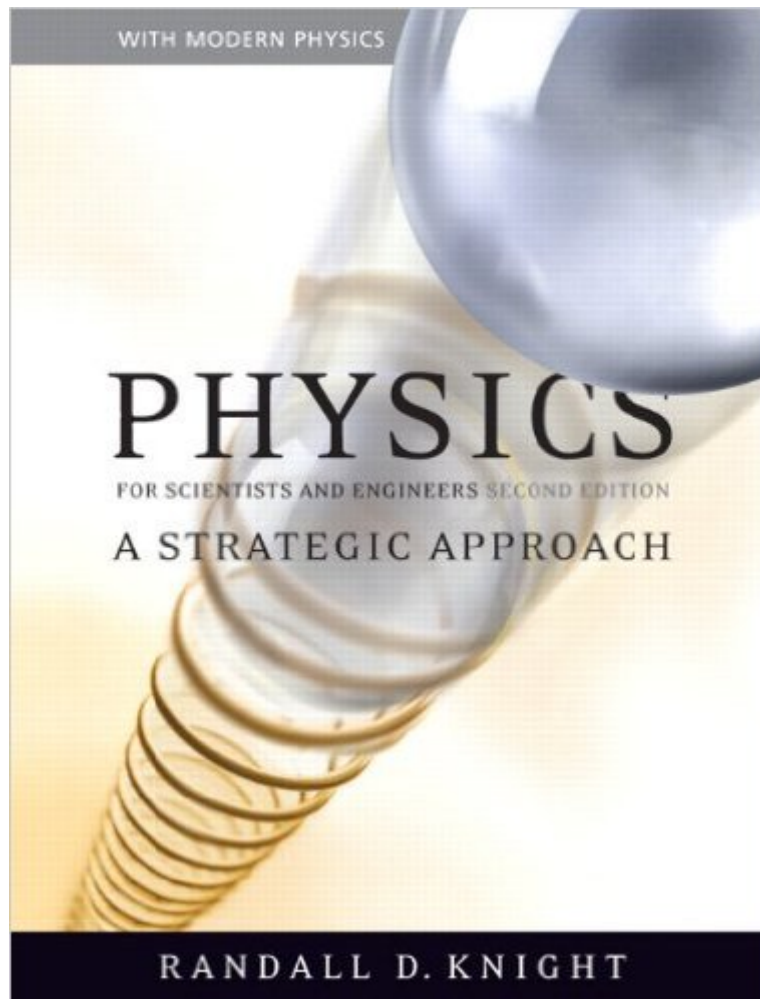


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# Physics For Scientists And Engineers: A Strategic Approach With Modern Physics (2nd Edition)



## Synopsis

**KEY MESSAGE:** As the most widely adopted new physics text in more than 50 years, Knight's *Physics for Scientists and Engineers* was published to widespread critical acclaim from professors and students. In this eagerly awaited second edition, Knight builds on the research-proven instructional techniques he introduced, as well as national data of student performance, to take student learning even further. Knight's unparalleled insight into student learning difficulties, and his impeccably skillful crafting of text and figures at every level "from macro to micro" to address these difficulties, results in a uniquely effective and accessible book, leading students to a deeper and better-connected understanding of the concepts and more proficient problem-solving skills. Building on an NSF-sponsored educational research program and input from tens of thousands of student users, the second edition refines and extends the pedagogical innovations that years of use has now shown to be effective. Unprecedented analysis of national student metadata has allowed every problem to be systematically enhanced for educational effectiveness, and to ensure problem sets of ideal topic coverage, balance of qualitative and quantitative problems, and range of difficulty and duration.

**Newton's Laws: Concepts of Motion** • Kinematics in One Dimension • Vectors and Coordinate Systems • Kinematics in Two Dimensions • Force and Motion • Dynamics I: Motion Along a Line • Dynamics II: Interacting Objects • Dynamics III: Motion in a Plane Conservation Laws: • Impulse and Momentum • Energy • Work Applications of Newtonian Mechanics: Rotation of a Rigid Body • Newton's Theory of Gravity • Oscillations • Fluids and Elasticity Thermodynamics: A Macroscopic Description of Matter • Work, Heat, and the First Law of Thermodynamics • The Micro/Macro Connection • Heat Engines and Refrigerators Waves and Optics: Traveling Waves • Superposition • Wave Optics • Ray Optics • Optical Instruments • Modern Optics and Matter Waves Electricity and Magnetism: Electric Charges and Forces • The Electric Field • Gauss's Law • The Electric Potential • Potential and Field • Current and Conductivity • Fundamentals of Circuits • The Magnetic Field • Electromagnetic Induction • Electromagnetic Fields and Waves • AC Circuits • Relativity and Quantum Physics: Relativity • The End of Classical Physics • Quantization • Wave Functions and Probabilities • One-Dimensional Quantum Mechanics • Atomic Physics • Nuclear Physics

**MARKET:** For all readers interested in leading students to a deeper and better-connected understanding of the concepts and more proficient problem-solving skills.

## Book Information

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## Customer Reviews

First off let me start with saying that I am going to compare this to a Serway's style of books. Both are good but just different in their approach. The strengths of Knight's book is that it approaches physics in a conceptual approach with heavy analysis of problem and then focuses on problem solving strategies. I like understanding the concept before just bashing away at problem solving. Knight's book gives you just enough details to understand the problem as a physicist with out flooding you with too many details. In short this book teaches you how to be a scientist. It has a very smooth transition to new and more complex subject that are related to the previous ideas presented. I learned from Serway's book in college for my calculus base physics and I found that one to be mechanistic and heavy handed on problems and very equation heavy with out demonstrating the concept a good as in Knight's book. Serway's is a good encyclopedic reference but I think that Knight's shows the art of thinking like a scientist.

This is the - best- textbook, I have ever read. I hated physics in high school, and now in college, I am a physics major. This book turned me around, this book got me through 1st year. Everything is taught to you from the ground up. Everything is clear and concise, there are plenty of worked through examples. However, you dont learn physics by reading, as a consequence there is a comprehensive list of exercises at the end of each chapter. These include both concept questions (which really test your knowledge), simple applications of chapter content, and progressively harder

problems. All these problems have full worked out solutions via the solution Manuel. this book will make you appreciate and understand physics like no teacher, no professor can. If you are serious about physics, then this book is a must.

I'd say this is a great textbook if you have an easy professor that only asks questions like "A 1 m long solenoid with 25 turns carries a current of 3A. What is the magnetic field?". However, if you have a professor that challenges you and asks difficult questions on your problem sets, tests, etc., you may find it lacking. Some areas are explained quite well (I'd say this applies earlier on with the "easier" topics) and others barely at all (most of the later, more complex topics). It got to the point where I wrote in my notes things like, "Ask professor wtf this means". The book has lots of nice pictures, but if you actually want both a qualitative and quantitative understanding, there are far better resources. Obviously, most looking at this book have to buy it because it's assigned by their professor, but if you're just searching for a good reference on the subject, go with Halliday & Resnick instead.

This book does a great job of presenting ideas and laying out theory in plain English, which makes it very approachable. The downfall of the text lays in the applications, where the example problems are worked through in a way that isn't compatible with how a person normally works through a problem. In stead of simply showing the math, like you would doing your homework, Knight's approach does a little math, then he writes at length using words what he's doing to solve the problem. When working through a problem set, it's nice to see how the math should be laid out, solve this, then you find this, here's where we're heading, because we need to find this variable. Instead, you'll be working on your problem set and you'll look for an example problem in the text to help you build your mathematical roadmap, but instead you're met with a lot of description, and, of course, like all textbooks, Knight skips the algebra and geometry. This is annoying. I don't care if an example takes up an entire page, just so long as it's thorough and shows the reader in step-by-step process of the logic and complete mathematics. Nevertheless, the plain English voice is a breath of fresh air, particularly since the book is billed for "scientists and engineers." Thankfully, also the book is image filled, showing direct examples of the classical mechanics and modern physics in action.

I took physics with this book as the required text. It is very easy to read. Lots of examples with varying difficulty. I like that it has a conceptual action of questions before it gives you the qualitative problems. Very efficient at delivering the material for an undergrad text.

--Pros--Much easier to read than many other physics books I've read.Covers a lot of topics--Cons--HugeExpensiveMaybe not as in-depth on some subjects as textbooks specific to that topic.

This book is good in the fact that it simplifies the challenging concepts of physics and has diagrams that make it easier to learn the material. As a student trying to learn physics, I did the practice problems at the end of the chapter. The answers to odd questions are at the back of the book, but this book had the **WRONG** answers in the back of the book. TOO many times to count, the wrong answer was found in the back of the book, and this is bad for students who are already confused about physics. For instance, it would ask to find the distance in meters, but the answer gave a random velocity.

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