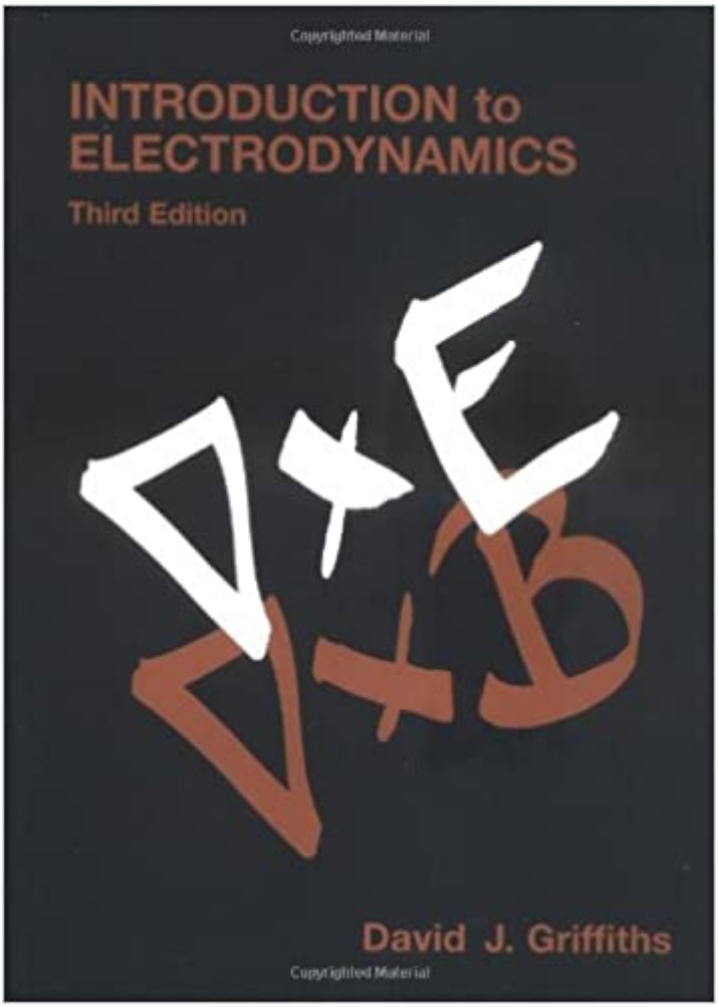
Introduction To Electrodynamics (3rd Edition)



Synopsis

For junior/senior-level electricity and magnetism courses. This book is known for its clear, concise and accessible coverage of standard topics in a logical and pedagogically sound order. The Third Edition features a clear, accessible treatment of the fundamentals of electromagnetic theory, providing a sound platform for the exploration of related applications (ac circuits, antennas, transmission lines, plasmas, optics, etc.). Its lean and focused approach employs numerous examples and problems.

Book Information

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Customer Reviews

Features a clear, accessible treatment of the fundamentals of electromagnetic theory. Its lean and focused approach employs numerous examples and problems. Carefully discusses subtle or difficult points. Contains numerous, relevant problems within the book in addition to end of each chapter problems and answers.

This text seemed to be a pretty popular textbook rated quite well for learning Electrodynamics. I noticed it was used by several universities and colleges so I ordered the book for self-study. I completed the first 415 pages (9 out of 12 chapters) which took me pretty much through what would be a basic course in Electrodynamics.Having spent about 5 months of self study which included completing most of the problems at the end of the individual sections here are some observations of what would have made this book better: 1. The author should give answers to the problems! How

can a person doing a self study know if they are doing the problems correctly?? Why keep them a secret? I know it would have added a couple pages to the book but what's the big deal? Fortunately, I was able to find the answers on-line. 2. There are additional problems at the end of each chapter. It would have been nice if the author identified which sections in the chapter the individual problems went with. Also, the end of chapter problems seemed to be very difficult at times. 3. I felt the explanation of quite a few concepts could have been expanded. It felt like many explanations were abbreviated and that the author was trying to give a "quickie" explanation in a lot of cases, especially as the book progressed. The last textbook I used many years ago was "Introduction to Electromagnetic Fields and Waves" by Corson and Lorrain (1962 Edition!). That book,which I believe is still available in newer editions, contained twice the explanation on important topics such as Maxwell's Equations and Electromagnetic Waves compared with Griffith's book. 4. Another big improvement would have been to have easier and more basic problems at the end of each section to teach the basic application of what was just explained. I felt in many instances, especially as the book progressed, the author jumped right away to applying the section's concepts to complex situations. I would definitely recommend to have Schaum's Outline of Electromagnetics present alongside Griffith's book. Schaum's Electomagnetics would show many basic and practical examples Griffith's book lacks.All of these suggestions would have made the book bigger, but the book is on the small side to begin with (7"x9.5") compared to many other physics textbooks I've used. For the topic of Electrodynamics a bigger book would have definitely been better. Maybe future editions will show some improvements.

Griffith's work in this book is utterly perfect.He breaks E&M in to parts: Part 0 is vector mathematics, which serves as a reference, and is explained repeatedly anyways throughout the book.. Part 1 is Electrostatics! And part 2 is Magneto-statics! Both of these obey nearly same equations, and have the same solutions, and affect materials similarly (in a linear fashion). So you learn electrostatics, and then you learn that magnetism is the same thing all over again. So the two parts are written almost exactly the same! (Here's the force on a particle, now here's the field, now here's the potential, now heres some cool solutions, now here's how to include material effects). Part 3 combines both in a logical fashion by considering simple cases and working on up to the holy grail equation of the force on one particle by another particle (which is so obsurdly complicated nobody uses it). Later we learn Part 1 and Part 2 were the same because magnetism and electrostatics are really the same phenomena observed in different frames thanks to relativity. He derives relativistic lorentz transformations for electrostatics and magnetostatics and proovs that maxwells four

equations are really just one matrix equation.This books is the holy grail, and Griffiths is an incredibly clear, rigorous lecturer, always knowing when to add plain english and when to stick to the hard mathematics. There were many times I didn't understand something. Yet, thanks to the incredibly rigourous logic and progression of ideas, it was always so easy to work back down to the foundations and answer any question for yourself. In fact, besides learning E&M, this is an amazing book to learn, from scratch, vector calculus.

Pros are largely what "A Reviewer" gives us from near Columbus, OH. Griffiths has wonderful, casual, and honest prose. The book reads like a collection of well-taken lecture notes. Also: the collection of problems to do is amazing. You can't do physics just by reading about it. I think that's the strength of all Griffiths texts: the great collection of problems available in each (though: I would rearrange the "!" marking "difficult" problems...some difficult problems are without "!" warnings).Also: a serious "con" that could be easily remedied: the almost complete lack of putting in realistic numerical values for results. I suppose that's the theoretian in Dr. Griffiths, but it would be nice to have some discussion of how electromagnetic theory gives electromagnetic lab-results. At best: Griffiths has theory collapsing into theory to establish validity of results (e.g., the electric field of a disk shrinking to that of a point-charge when your distance away dwarfs the diameter of the disk). In essence: theoretical results collapse to theoretical results, but theoretical results are not made to collapse to experimental results. For instance, by modeling a wire as a 1 mm-diameter cylinder and putting a few microcoulombs of charge on it, I proved to my lab-students that the electric field just outside that metal-cylinder was a few million Newtons per Coulomb, which, in turn, caused an electron to accelerate at a few billion meters/second^2, which, in turn, at least mildly suggested relativistic speeds of electrons being accelerated by the large fields of van der Graaf generators....their first lab. If only Griffiths discussed such a concept...there are so many physics-lab-freshman who have been repeatedly shocked by a van der Graaf generator, and are just primed for a rewarding "Aha!" when Gauss's Law tells them about how large a field is around the wire-comb-teeth inside the metal-sphere of the van der Graaf generator.The inability to use a Griffiths text as a reference could be remedied by a summary of formulae and results at the end of every chapter. Sometimes, it's hard to pick out an important result amidst the casual prose. A frequently-used equation sometimes appears in what seems to a mid-Griffiths-sentence or afterthought of Griffiths, and deceivingly so. Now: that could be a nice lesson to "Pay Attention and Read the Text Carefully" a good habit we all stray from, but one could make a case for the reader too, as I have.Those criticisms (which I believe constructive) establish: I recommend anyone serious

about learning electromagnetism use this book and work the problems inside. (You do get to a point when you can work problems quickly, which is satisfying...hopefully, that testimony of my experience will hearten the timid reader).Well, off to Do Physics! :)

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