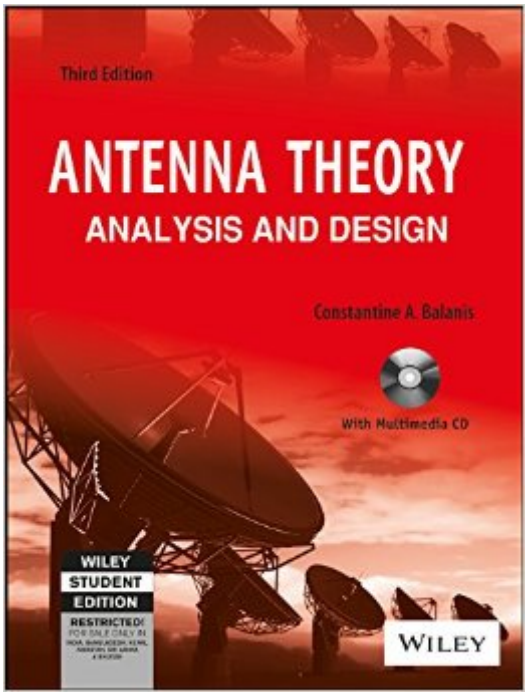
Antenna Theory: Analysis And Design, 3Rd Ed



Synopsis

The third edition of antenna theory is designed to meet the needs of electrical engineering and physics students at the senior undergraduate and beginning graduate levels, and those of practicing engineers as well. The text assumes that the students have a knowledge of basic undergraduate electromagnetic theory, including maxwell's equations and the wave equation, introductory physics, and differential and integral calculus. 1. Antennas. 2. Fundamental parameters of antennas. 3. Radiation integrals and auxiliary potential functions. 4. Linear wire antennas. 5. Loop antennas. 6. Arrays: linear, planar, and circular. 7. Antenna synthesis and continuous sources. 8. Integral equations, moment method, and self and mutual impedances. 9. Broadband dipoles and matching techniques. 10. Traveling wave and broadband antennas. 11. Frequency independent antennas, antenna miniaturization and fractal antennas. 12. Aperture antennas. 13. Horn antennas. 14. Microstrip antennas. 15. Reflector antennas. 16. Smart antennas. 17. Antenna measurements.

Book Information

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Customer Reviews

I bought this book when I needed to analyze antennas in arrays in and found it very competent and logical. There are many things to like about it:1. comprehensive coverage of antenna types and analysis techniques2. Chapter 2 contains a nice compendium of definitions according to IEEE standards, with enough mathematical detail to make it useful in its own right.3. Good explanations of the material. It's not a cookbook (that's good!). Balanis provides clear text and derivations of the key results, with illustrations. He hasn't watered down the level of sophistication of his topics; they aren't at the research level, but they are fully at the level of the established state of the art.4) Error-free. I typically wrestle with a few errors or typos in a text as I repeat derivations or perform calcs in the

course of my work. I haven't found any errors here so far.Coverage of the various antenna types is pretty standard. It's in discussions of topics like the Method of Moments, reciprocity, and self- and mutual- impedance, and the method of stationary phase where the book shines--they are clear, easy to follow, with sufficient detail to solve real problems.Shortcomings of the book are few, but include:a) sparse or no treatment of advanced topics such as scattering, array implementation, network approach (foster's reaction theorem, relation of mutual coupling to measured scattering parameters), etc.b) inclusion of Fortran (!) programs for the calculations. Matlab, Mathcad or just plain descriptions would be more useful. Puzzling since one Matlab file is included.I recommend this book heartily. Engineering practicality and mathematical rigor are balanced nicely. The lack of advanced topic coverage is easily made up by going to specialty texts or the research literature. It worked well for me as a self-study text, and should work for you too.

Any one who have had an introductory course on electromagnetics may use this book either as a reference for an antenna design or as a perfect learning material. Balanis' clear, informative language, enhanced with many illustrations help the student to understand the subject easily. Due to its wide range of topics, the book is of invaluable help for an antenna designer. The diskette provided with the book includes FORTRAN codes for many practical design problems and frees the reader from complicated formulas. A must have for any enginneer involved in the subject!

I have two standard textbooks on antennas, namely, Antenna Theory by Balanis and Antennas by Kraus (both third edition). Both are good books. But if I could keep only one book, I would definitely choose Balanis because, in my non-expert opinion, it is more coherent, more systematic, and has a stronger emphasis on principles. Balanis also comes with a helpful CD containing Powerpoint slides (tons of them), Matlab files, and a few other items. The paper quality is superb but the paper thickness makes for a tome that feels like a heavy college dictionary. The mathematics is not as scary as I originally thought, and should be okay for final year EE undergraduates. I recommend this book highly and unreservedly.

This text has been a standard in graduate antenna theory classes for years. The first edition was also well written, but the author has reorganized some of the chapters and better explains some of the more advanced topics. This is the only text I'll ever use for my intro to antenna theory classes.

If you are an upper-level/graduate student who doesn't like derivations (you know who you are), this

book is not the greatest choice for you. The way the book is written is very dry and not conducive to staying awake. Reading this (and taking notes) at my own pace, I took three months to wade through Chapter 2! I had to mark several pages with sticky notes to remember to re-read things I didn't understand.On the other hand, this book has some nice reference information if you are doing computer simulations of antennas, and would like to double-check the results of your models. The graphs and figures were extra helpful. The index generally supports the use of this book as a reference text, although it has failed to identify some very helpful graphs.Overall, it is a decent book, and I'm glad to have a copy. I've just started reading another antennas book, Antennas For All Applications, 3rd. ed., by John Kraus and Ronald Marhefka, and I find it much easier to read. In one sentence, that book explained radiation resistance in a way that made more sense to me than all the definitions and equations in an entire section of the Balanis text. The layout on each page of the Kraus book was easy on the eyes, with the text in the standard Times New Roman and the Figure captions in an Arial type of font, which made it easier to read.If you are a student who usually ends up wasting time or dozing off when you try to read your textbook, you'll do the same with this one. If you just need to read a section or two as a reliable reference, this book is fine.

The pedagogy contained within this book is fairly lacking. For example, the book does not give a clear derivation of the free-space Green's function; it basically just gives a plausibility argument and tells you what it is. This, in a 1,000 page text book whose every subsequent topic depends on the Green's function. Another example: the book goes to lengths to establish the vector potentials, then promptly discards the process of currents -> potentials -> fields at the very first opportunity to make use of it (deriving the pattern of a half-wave dipole) in favor of a more ad-hoc method. The book is basically a large compendium of formulas that is not especially conducive to deeper understanding of antenna theory. You're on your own for that. So it will help if this is not your first exposure to the topic of electromagnetics and antennas. That having been said, it is a huge volume that gives a basic introduction to many kinds of radiators. Unfortunately, with such breadth the depth is limited, and you will likely need further resources to be able to design a non-trivial antenna using any one of the radiator types discussed. Another aspect of this book is that the problems are written very very poorly. They often give confusing, contradictory, or incomplete information and ask for non-sensical things to be calculated. I've found the CD-ROM useless. (CD-ROMs seem to primarily serve as justification for high textbook prices.) I suggest the antenna book by Stutzman and Thiele for significantly better pedagogy and heuristics. Even Balanis' other book "Advanced Engineering Electromagnetics" seems to be a better guide to understanding the physics of antennas than this

book is (of course that book does not cover analysis techniques for any specific radiators).

Modern Methods of Reflector Antenna Analysis and Design (Artech House Antenna Library) Antenna Theory: Analysis and Design, 3rd Edition Antenna Theory: Analysis And Design, 3Rd Ed Antenna Theory and Design, 3rd Edition HDTV Antenna: Over-The-Air HDTV Antenna Instructions Antenna Fundamentals- Module 4: Radio Antenna Systems - Analysis, Synthesis and Design of Chemical Processes (3rd Edition) 3rd (third) Edition by Turton, Richard, Bailie, Richard C., Whiting, Wallace B., Sh [2009] Microstrip and Printed Antenna Design (Electromagnetics and Radar) Microstrip Antenna Design Handbook (Artech House Antennas and Propagation Library) Small Antenna Design (Communications Engineering (Paperback)) Modern Antenna Design Antenna Design: A Practical Guide Feng Shui: Wellness and Peace- Interior Design, Home Decorating and Home Design (peace, home design, feng shui, home, design, home decor, prosperity) Real Analysis : Theory of Measure and Integration (3rd Edition) Game Theory : A Nontechnical Introduction to the Analysis of Strategy (3rd Edition) Digital Control System Analysis and Design (3rd Edition) Hydrologic Analysis and Design (3rd Edition) Analysis, Synthesis and Design of Chemical Processes (3rd Edition) Space Mission Analysis and Design, 3rd edition (Space Technology Library, Vol. 8) Computer-Controlled Systems: Theory and Design (3rd Edition)