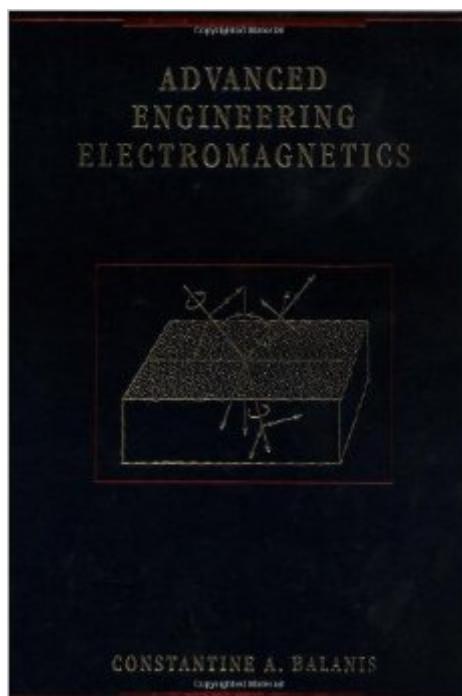


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# Advanced Engineering Electromagnetics



## Synopsis

A second course in electromagnetics, offering integrated, detailed coverage of the classical topics, from Maxwell's equations to Green's functions. Covers electromagnetic boundary-value problems in rectangular, cylindrical, and spherical coordinates. Also includes computer programs for the solution of assigned problems.

## Book Information

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## Customer Reviews

I worked with this book when I studied microwaves and electromagnetic fields, I must say the author goes in a very deep analysis on each topic with a clear and precise language very suitable for a 4 year, or graduated, student. The part of resonators talking about the superior modes of transmission is magnificent. also the interfaces between different media.

In this book Balanis goes into great detail covering the solutions of the wave equation for several important boundary-valued EM problems in different coordinate systems. One of the other reviewers complains of the wordiness in this book and how Balanis' solves both the TE and TM problems in every case. I do not see the faults here as these are fundamental concepts that all graduate level electromagnetics students need to become familiar with. Wordiness, especially to someone unfamiliar with many of the more complex topics in electromagnetics, is only beneficial. Later in the book Balanis includes very basic discussions on the Method of Moments, which are pretty much cut-and-paste from his antenna book. As there are other resources dealing specifically with the MoM, there is really no reason to include it here. Otherwise, a timeless reference that refers to over

and over again.

This is a good introduction to EM for Graduate Students. Having been educated with the physics approach of Jackson this is an excellent EE approach to electromagnetics (i.e. practical). The best recommendation I can give is that I actually own a copy.

I have many E&M texts primarily because there are so many nuances to learn and I find it important to have different points of view. However, the Balanis text does something the others doesn't. It covers a great deal of ground and puts the multitude of equations into a 'BOX' for easy reference. And all these equations are derived in a very straight forward fashion so a person can remember them and understand their basis. Most texts have the equations all over the place and when trying to solve problems you wonder where to look next. Not so with Balanis. In fact, I have definitely been able to solve E&M problems now after reading his book then I could do before it. If E&M is your field this text is a must.

This is an extraordinary book to learn advanced electromagnetics from. Mr Balanis is Greek and it seems to me he uses the same method Socrates invented more than 2000 years ago which is the following as reported by Plato: truth (in this case electromagnetic theory) is present in everyone of us, what is left to the wise educator (teaching engineer) is to make everyone conscious of this inner truth using the most simple method of reducing the whole to its most elementary pieces and then using basic logic for reassemble it in a conscious way. This is exactly Mr Balanis winning strategy: he begins from the most basal things in electromagnetic theory like wave equations, Poynting vectors and potential theory and then progresses in the clearest possible way to very advanced topics like scattering theory, integral methods, Green functions etc. etc. What is wonderful is that you are able to grasp the use of very advanced mathematical objects like special functions (Bessel, Hankel etc. etc.) with a reasonable effort (in many other texts of comparable level they suppose you know more or less everything of this stuff!). In the end you are able to actually develop your analytical models for the analysis of real problems. The only improvement of this semi-perfect book would be to explain more of the included Fortran code. I give this book 5 stars! Grazie Mr Balanis!

Tons of math and no hidden steps in the derivations. More than once and twice, same derivations are carried out many times for different waveguides or structures (e.g. Fundamental TE or TM mode distribution calculation for cylindrical/rectangular waveguides departing from Maxwell equations), but

this is the way i personally like it. Each chapter is almost self-contained, but at the same time related to adjacent chapters. Following Ballanis' writing style, it's concise and easy to follow, though sometimes repetitive. Chapters on complex permittivity, Integral methods and so on are very welcome. Nonetheless, the involved math is not complicated, if you are used to waveguide theory.

This book is AWESOME. It has all the right material in the right amount explained in the right way. Of course supplement with other books because one book only gives one angle. But if you study EM from the electrical engineer's perspective you must own this.

This book is an excellent example of a textbook written for students. The author clearly presents all of the math that he uses and does a fantastic job of using illustrations to highlight key information. Make no mistake, the subject matter is quite difficult, but the methodology used by the author is clear and well-explained. Furthermore, Balanis rewrites equations from previous chapters and sections when he refers to them, so you do not have to break your concentration by flipping back and forth to other parts of the text. The author's use of worked-through examples is also a huge help. The only negative thing that I've heard about this book is that sometimes you can lose sight of the big picture amidst all of the math that's presented. My belief is that there are many sources of basic concepts available to students, but a thorough derivation of electromagnetic mathematics is quite rare. Furthermore, the author provides a nice summary in most chapters to remind readers what they should have learned about in that section. Many of my friends have used Jackson's book for advanced E&M, and owning both, I can say that I prefer to learn from Balanis, but refer to Jackson once I've learned a topic since I feel his explanations are sometimes more concise. That said, I chose to purchase both and was very glad that I did as they are both fantastic in their own way.

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