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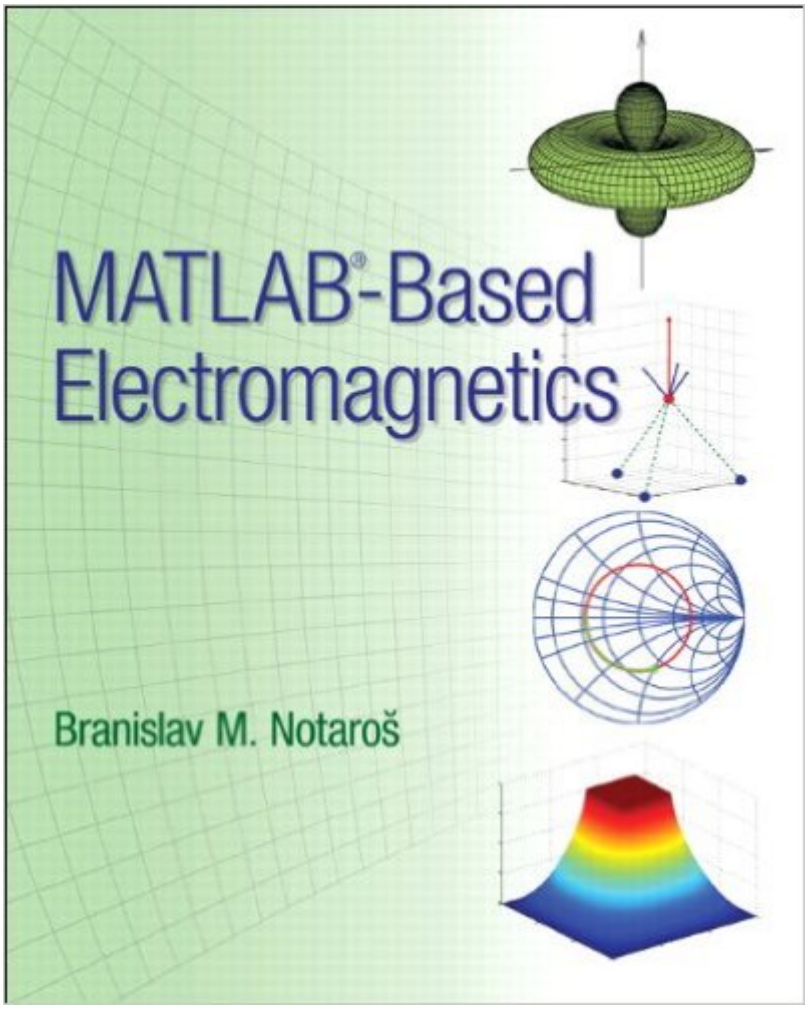
MATLAB-Based Electromagnetics



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Synopsis

This is the eBook of the printed book and may not include any media, website access codes, or print supplements that may come packaged with the bound book.Â This title can be used to either complement another electromagnetics text, or as an independent resource. Designed primarily for undergraduate electromagnetics, it can also be used in follow-up courses on antennas, propagation, microwaves, advanced electromagnetic theory, computational electromagnetics, electrical machines, signal integrity, etc. This title also provides practical content to current and aspiring industry professionals. Â MATLAB-Based Electromagentics provides engineering and physics students and other users with an operational knowledge and firm grasp of electromagnetic fundamentals aimed toward practical engineering applications, by teaching them â œhands onâ • electromagnetics through a unique and comprehensive collection of MATLAB computer exercises and projects. Essentially, the book unifies two themes: it presents and explains electromagnetics using MATLAB on one side, and develops and discusses MATLAB for electromagnetics on the other. Â MATLAB codes described (and listed) in TUTORIALS or proposed in other exercises provide prolonged benefits of learning. By running codes; generating results, figures, and diagrams; playing movies and animations; and solving a large variety of problems in MATLAB, in class, with peers in study groups, or individually, readers gain a deep understanding of electromagnetics.

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Customer Reviews

This is a very helpful book in learning applications of electromagnetics. If you do not have much coding experience, there are many helpful tutorials to teach you some coding basics. Along with tutorials, there are figures to show what the expected output should look like in order to check answers. I would highly recommend this book to help any student visualize fundamental principles of e-mag, while learning useful programming skills. Along with this book, I would recommend Dr. Notaros' "Electromagnetics" textbook. Several MATLAB examples refer to figures and problems from this book. I think that using both books gave the complete understanding of the subject material.

During my undergraduate career, I used this book in three different courses: A two-semester junior-level electromagnetics course sequence and a senior-level course on antenna theory. During these classes, I noticed that most electromagnetics textbooks involve a heavy dose of abstract concepts and formula derivations. As a result, many students are left without a very good intuitive grasp of the subject material.This book is a supplement to any such standard electromagnetics textbook (Although it was explicitly intended to be a supplement to Electromagnetics by the same author, Branislav Notaros), containing many helpful exercises that provide a much deeper understanding than rote memorization of equations. It has several excellent exercises for plotting and visualizing fields, including some codes that involve producing vector fields, 3D plots, and animated graphics. Many of these plots are included in the book, so that students can check their work.In addition to the helpfulness with visualizing concepts, this book is also a very good introduction to MATLAB programming in general. Many of the exercises are presented in a â œTutorialâ • format, walking the student through the coding procedure with a detailed explanation of each step of converting theory and equations into MATLAB syntax. This was especially helpful to me as I was able to apply those skills in other engineering classes.I cannot recommend this book enough to both electromagnetics course instructors as well as to students who are looking to expand their conceptual understanding of electromagnetics.

I used this book in conjunction Dr. Notaros's general Electromatics textbook for my undergrad emag class. While I don't think anyone would actually purport to enjoy emag exercises, I found these programming exercises to be a pleasant change from the paper and pencil kind. Through most of my undergrad, I always had trouble linking all the hand-written calculus and esoteric engineering functions to things I would do in a real job. Sure, in my internships I had seen plenty of mathmatical and engineering work in action, but it had all been done in code, and the 'calculus' and such was barely recognizable in the form of numerical methods. So doing the emag exercises in code after learning them in their traditional form helped me make that link of "oh, so that's how you actually use this stuff". That, and seeing variables that would take an hour to solve by hand suddenly solved in a millisecond is quite satisfying.Overall, I think the book is a valuable resource and worth taking seriously, even if it's just to force you to learn a little programming. In the real world all of this kind of stuff ends up as code, and the quicker you learn to make the link between theory and code, the better off you're going to be.

One of the key difficulties that students face when learning about electromagnetics is the ability to visualize the invisible phenomena they are studying. Dr. Notaros' book addresses this issue and provides hundreds of MATLAB examples that make the material far more accessible. This book challenges students to truly understand the material beyond the obfuscation of pure math.Additionally, MATLAB is becoming industry standard knowledge for engineers. Having a firm understanding of MATLAB software and syntax is an excellent addition to your resume.

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