

Engineering Electromagnetics By Nathan Ida Free Ebook Download

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Surface Impedance Boundary Conditions Springer Science & Business Media

This handbook comprehensively covers the cutting-edge trends and techniques essential for the integration of nondestructive evaluation (NDE) into the changing face of the modern industrial landscape. In particular, it delves into the marriage of NDE with new techniques in e.g. data mining, cloud computing and autonomous operation, highlighting the potential for cyber-physical controlled production and discussing the myriad possible applications across many different industries. The Handbook of NDE 4.0 centers around the Internet of Things and Industry 4.0 – the next generation of industrial production encompassing all aspects of networking across all industrial areas. It discusses the adaptation of existing NDE techniques to emerging new technological areas, such as 3D printing, via the introduction of cyber systems into the inspection and maintenance processes. In addition, the handbook covers topics such as the management and processing of big data with respect to real-time monitoring of structural integrity and reliable inspection of individual components. Remote NDE to include competence not available on-site will be a potential technique to increase reliability of NDE inspections by integrating additional specialist inputs into the decision process by methods such as telepresence, thereby better leveraging the scarce resources of senior inspectors into industrial inspections at multiple sites. The handbook houses a wealth of essential information to help academics, industry professionals and entrepreneurs navigate through this burgeoning new field. The material in this handbook is presented with the intention of ultimately improving human safety through reliable inspections and dependable maintenance of critical infrastructure, while also enhancing business value through reduced downtime, affordable maintenance, and talent optimization.

Engineering Electromagnetics Springer Science & Business Media

Electromagnetic scattering from complex objects has been an area of in-depth research for many years. A variety of solution methodologies have been developed and utilised for the solution of ever increasingly complex problems. Among these methodologies, the subject of impedance boundary conditions has interested the authors for some time. In short, impedance boundary conditions allow one to replace a complex structure with an appropriate impedance relationship between the electric and magnetic fields on the surface of the object. This simplifies the solution of the problem considerably, allowing one to ignore the complexity of the internal structure beneath the surface. This book examines impedance boundary conditions in electromagnetics. The introductory chapter provides a presentation of the role of the impedance boundary conditions in solving practical electromagnetic problems and some historical background. One of the main objectives of this book is to present a unified and thorough discussion of this important subject. A method based on a spectral domain approach is presented to derive the Higher Order Impedance Boundary Conditions (HOIBC). The method includes all of the existing approximate boundary conditions, such as the Standard Impedance Boundary Condition, the Tensor Impedance Boundary Condition and the Generalised Impedance Boundary Conditions, as special cases. The special domain approach is applicable to complex coatings and surface treatments as well as simple dielectric coatings. The spectral domain approach is employed to determine the appropriate boundary conditions for planar dielectric coatings, chiral coatings and corrugated conductors. The accuracy of the proposal boundary conditions is discussed. The approach is then extended to include the effects of curvature and is applied to curved dielectric and chiral coatings. Numerical data is presented to critically assess the accuracy of the results obtained using various forms of the impedance boundary conditions. A number of appendices that provide more detail on some of the topics addressed in the main body of the book and a selective list of references directly related to the topics addressed in this book are also included.

Sensors, Actuators, and Their Interfaces Cram101

This text provides students with the missing link that can help them master the basic principles of electromagnetics. The concept

of vector fields is introduced by starting with clear definitions of position, distance, and base vectors. The symmetries of typical configurations are discussed in detail, including cylindrical, spherical, translational, and two-fold rotational symmetries. To avoid serious confusion between symbols with two indices, the text adopts a new notation: a letter with subscript 1-2 for the work done in moving a unit charge from point 2 to point 1, in which the subscript 1-2 mimics the difference in potentials, while the hyphen implies a sense of backward direction, from 2 to 1. This text includes 300 figures in which real data are drawn to scale. Many figures provide a three-dimensional view. Each subsection includes a number of examples that are solved by examining rigorous approaches in steps. Each subsection ends with straightforward exercises and answers through which students can check if they correctly understood the concepts. A total 350 examples and exercises are provided. At the end of each section, review questions are inserted to point out key concepts and relations discussed in the section. They are given with hints referring to the related equations and figures. The book contains a total of 280 end-of-chapter problems.

Electromagnetics, Microwave Circuit and Antenna Design for Communications Engineering Courier Corporation

Electromagnetic Field Theory and Transmission Lines is ideal for a single semester, first course on Electromagnetic Field Theory (EMFT) at the undergraduate level. This book uses diagrammatic representations and real life examples to explain the fu

Principles of Electrodynamics John Wiley & Sons

Never HIGHLIGHT a Book Again Includes all testable terms, concepts, persons, places, and events. Cram101 Just the FACTS101 studyguides gives all of the outlines, highlights, and quizzes for your textbook with optional online comprehensive practice tests. Only Cram101 is Textbook Specific. Accompanies: 9780872893795. This item is printed on demand.

Principles of Electric Machines and Power Electronics CRC Press

Shelving Guide: Electrical Engineering Since the 1980s more than 100 books on the finite element method have been published, making this numerical method the most popular. The features of the finite element method gained worldwide popularity due to its flexibility for simulating not only any kind of physical phenomenon described by a set of differential equations, but also for the possibility of simulating non-linearity and time-dependent studies. Although a number of high-quality books cover all subjects in engineering problems, none of them seem to make this method simpler and easier to understand. This book was written with the goal of simplifying the mathematics of the finite element method for electromagnetic students and professionals relying on the finite element method for solving design problems. Filling a gap in existing literature that often uses complex mathematical formulas, *Electromagnetics through the Finite Element Method* presents a new mathematical approach based on only direct integration of Maxwell's equation. This book makes an original, scholarly contribution to our current understanding of this important numerical method.

Field and Wave Electromagnetics John Wiley & Sons

Sensors and actuators are used daily in countless applications to ensure more accurate and reliable workflows and safer environments. Many students and young engineers with engineering and science backgrounds often come prepared with circuits and programming skills but have little knowledge of sensors and sensing strategies and their interfacing.

Electromagnetics and Calculation of Fields Institution of Engineering and Technology

This handbook is a comprehensive source of information on all aspects of non-destructive testing (NDT), for use by professionals, educators, and most of all, by the practitioners of testing. The art of NDT consists of dozens of methods, some classical, and some emerging. As the pace of industrial work and discovery intensifies and materials are utilized to their physical limits, the role of NDT becomes ever more important. As a result, the methods of testing are themselves evolving, and it is the intent of this book to capture this evolution. Handbook of Modern Non-Destructive Testing broadens the scope from traditional books on the subject. In addition to classical, emerging and exotic methods of evaluation, the book will also cover the use of NDT techniques in other fields, such as archaeology or resource exploration. With contributions from experts in all areas of the field, the reader will find balanced coverage of a variety of testing methods, with no bias against or endorsements of any particular method. The book treats many areas in depth, covering all

aspects of testing, and will include case studies where appropriate. Additional coverage of statistical methods and their use, as well as simulations' role in testing and test design, are included.

Computer-aided Analysis and Design of Electromagnetic Devices Engineering Electromagnetics

If you're looking for a clear, comprehensive overview of basic electromagnetics principles and applications to antenna and microwave circuit design for communications, this authoritative book is your best choice. Including concise explanations of all required mathematical concepts needed to fully comprehend the material, the book is your complete resource for understanding electromagnetics in current, emerging and future broadband communication systems, as well as high-speed analogue and digital electronic circuits and systems.

Engineering Electromagnetics Wiley Global Education

This volume provides a discussion of the challenges and perspectives of electromagnetics and network theory and their microwave applications in all aspects. It collects the most interesting contribution of the symposium dedicated to Professor Peter Russer held in October 2009 in Munich.

Numerical Modeling for Electromagnetic Non-Destructive Evaluation Pearson Education India Engineering ElectromagneticsSpringer Science & Business Media

Theory and Computation of Electromagnetic Fields Springer Science & Business Media

Sensor fundamentals -- Application considerations -- Measurement issues and criteria -- Sensor signal conditioning -- Acceleration, shock and vibration sensors -- Biosensors -- Chemical sensors -- Capacitive and inductive displacement sensors -- Electromagnetism in sensing -- Flow and level sensors -- Force, load and weight sensors -- Humidity sensors -- Machinery vibration monitoring sensors -- Optical and radiation sensors -- Position and motion sensors -- Pressure sensors -- Sensors for mechanical shock -- Test and measurement microphones -- Strain gages -- Temperature sensors -- Nanotechnology-enabled sensors -- Wireless sensor networks: principles and applications.

Electromagnetic Field Theory and Transmission Lines Academic Internet Pub Incorporated

Montgomery, Runger, and Hubele provide modern coverage of engineering statistics, focusing on how statistical tools are integrated into the engineering problem-solving process. All major aspects of engineering statistics are covered, including descriptive statistics, probability and probability distributions, statistical test and confidence intervals for one and two samples, building regression models, designing and analyzing engineering experiments, and statistical process control. Developed with sponsorship from the National Science Foundation, this revision incorporates many insights from the authors teaching experience along with feedback from numerous adopters of previous editions.

Introduction to Electromagnetic Fields Springer

Microwave testing has been paid only scant attention in the literature as a method for nondestructive testing of materials, yet it offers some attractive features, especially for the testing of composite and other non-metallic materials. Microwave techniques have been used in a large number of applications that can be classified as nondestructive testing applications, ranging from large scale remote sensing to detection of tumors in the body. This volume describes a unified approach to microwave nondestructive testing by presenting the three essential components of testing: theory, practice, and modelling. While recognizing that each of these subjects is wide enough to justify a volume of its own, the presentation of the three topics together shows that these are interrelated and should be practiced together. While few will argue against a good theoretical background, modelling and simulation of the testing environment is seldom part of the NDT training in any method, but particularly so in microwave testing. The text is divided in four parts. The first part presents the field theory background necessary for understanding the microwave domain. The second part treats microwave measurements as well as devices and sources and the third part discusses practical tests applicable to a variety of materials and geometries. The fourth part discusses modelling of microwave testing. Each chapter contains a bibliography intended to expand on the material given and, in particular, to point to subjects which could not be covered either as not appropriate or for lack of space. For engineers, applied physicists, material scientists.

Engineering Electromagnetics CRC Press

This book reviews the current state of all types of electromagnetic testing techniques and considers

the implications of innovations for future inspection practice both in Europe and Japan. This volume provides researchers with an overview of exchanges on the subjects of ACPD and ACFM from both Japanese and continental perspectives. For instance: the Japanese project of applied electromagnetic theory to inspect nuclear power plants and the theory of signal inversion for flaw identification.

Topics covered are: - Inversion, imaging and flaw reconstruction - Advanced signal processing - Artificial intelligence and neural networks - Modelling, simulation and benchmark problems - Reliability of inspections, new techniques and novel sensors - Automation of data acquisition and processing The work covers a wide range of disciplines and will therefore serve a large number of researchers of electromagnetic theory for the next millennium.

Microwave NDT Elsevier Publishing Company

The 1988 Nobel Prize winner establishes the subject's mathematical background, reviews the principles of electrostatics, then introduces Einstein's special theory of relativity and applies it to topics throughout the book.

Handbook of Advanced Nondestructive Evaluation McGraw-Hill College

This text not only provides students with a good theoretical understanding of electromagnetic field equations but it also treats a large number of applications. No topic is presented unless it is directly applicable to engineering design or unless it is needed for the understanding of another topic. Included in this new edition are more than 400 examples and exercises, exercising every topic in the book. Also to be found are 600 end-of-chapter problems, many of them applications or simplified applications. A new chapter introducing numerical methods into the electromagnetic curriculum discusses the finite element, finite difference and moment methods.

Outlines and Highlights for Engineering Electromagnetics by Nathan Ida, ISBN IOS Press

Magnetic Materials and 3D Finite Element Modeling explores material characterization and finite element modeling (FEM) applications. This book relates to electromagnetic analysis based on Maxwell's equations and application of the finite element (FE) method to low frequency devices. A great source for senior undergraduate and graduate students in electromagnetics, it also supports industry professionals working in magnetics, electromagnetics, ferromagnetic materials science and electrical engineering. The authors present current concepts on ferromagnetic material characterizations and losses. They provide introductory material; highlight basic electromagnetics, present experimental and numerical modeling related to losses and focus on FEM applied to 3D applications. They also explain various formulations, and discuss numerical codes. • Furnishes algorithms in computational language • Summarizes concepts related to the FE method • Uses classical algebra to present the method, making it easily accessible to engineers Written in an easy-to-understand tutorial format, the text begins with a short presentation of Maxwell's equations, discusses the generation mechanism of iron losses, and introduces their static and dynamic components. It then demonstrates simplified models for the hysteresis phenomena under alternating magnetic fields. The book also focuses on the Preisach and Jiles–Atherton models, discusses vector hysteresis modeling, introduces the FE technique, and presents nodal and edge elements applied to 3D FE formulation connected to the hysteretic phenomena. The book discusses the concept of source-field for magnetostatic cases, magnetodynamic fields, eddy currents, and anisotropy. It also explores the need for more sophisticated coding, and presents techniques for solving linear systems generated by the FE cases while considering advantages and drawbacks.

Electromagnetics Springer Science & Business Media

Never HIGHLIGHT a Book Again! Virtually all of the testable terms, concepts, persons, places, and events from the textbook are included. Cram101 Just the FACTS101 studyguides give all of the outlines, highlights, notes, and quizzes for your textbook with optional online comprehensive practice tests. Only Cram101 is Textbook Specific. Accompanys: 9780387201566 .

Electromagnetics through the Finite Element Method John Wiley & Sons Incorporated

Engineers do not have the time to wade through rigorously theoretical books when trying to solve a problem. Beginners lack the expertise required to understand highly specialized treatments of individual topics. This is especially problematic for a field as broad as electromagnetics, which propagates into many diverse engineering fields. The time h