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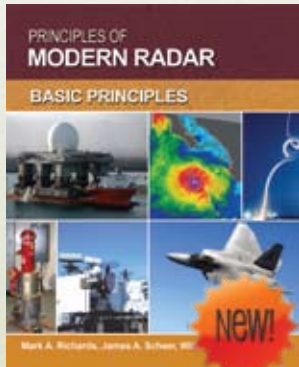
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WORLDWIDE DISTRIBUTOR CONTACTS

Principles of Modern Radar

radar/ew

When the first book in this three book series was published May 2010, the bar for radar knowledge was raised. The POMR series covers basic principles, applications, and advanced techniques. By the publication of the third volume these books will have been “community reviewed” by hundreds of volunteers in industry and academia from around the world.

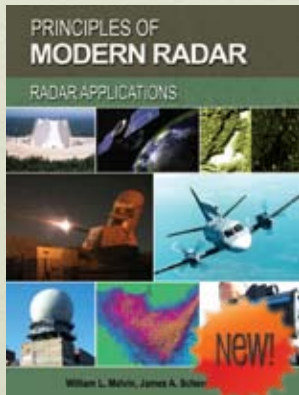


PRINCIPLES OF MODERN RADAR: BASIC PRINCIPLES

Edited by Mark A. Richards, James A. Scheer, William A. Holm
ISBN 978-1-891121-52-4 • 960 pp. • ©2010 • Hardcover • \$135.00

This is a **completely new textbook & reference**, developed from scratch by 15 scientists and engineers working today with the most **modern** systems and techniques in radar technology. Basic Principles provides a breadth of coverage unmatched by currently available introductory textbooks including chapters on: **fundamental concepts; propagations and echo phenomenology for targets and interference; all major subsystems of a modern radar; all basic signal processing functions so important to modern practice.**

Basic Principles equally serves both academic instruction in radar fundamentals courses, as well as professional short courses offered in industry. A group of more than 50 volunteers from the radar community vetted *Basic Principles*, making this the first community reviewed radar textbook. In just 6 months, Basic Principles was adopted by 14 universities and two defense contractors for their courses.



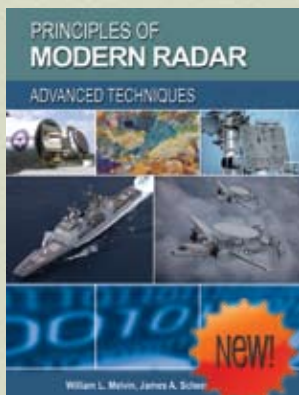
PRINCIPLES OF MODERN RADAR: RADAR APPLICATIONS

Edited by William L. Melvin, James A. Scheer
ISBN 978-1-891121-54-8 • 540 pp. • November 2012 (forthcoming) • Hardcover • \$149.00

This unique book provides in-depth discussions of the most important application areas in current radar practice, serving primarily radar practitioners and advanced graduate students. For those needing to become experts in an advanced technology or application area, **this is the foundation of their research.** *Radar Applications* goes so far as to suggest the best books and literature to expand knowledge with. It follows the lead of *Basic Principles* with over 40 volunteer reviewers vetting the manuscript.

CONTENTS

Overview • Continuous Wave Radar • Millimeter Microwave Applications • Fire Control Radar • Airborne Pulse Doppler Radar • Multiple-Function Phased Array Radar Systems • Ballistic Missile Defense Radars • Early Warning Radar • Surface Moving Target Indication • Dismount Detection • Space-Based Radar • Passive and Bistatic Radar • Advanced Processing Methods for Passive Radar • Weather Radar • Foliage Penetrating Radar • Ground Penetrating Radar



PRINCIPLES OF MODERN RADAR: ADVANCED TECHNIQUES

Edited by William L. Melvin, James A. Scheer
ISBN 978-1-891121-53-1 • 800 pp. • July 2012 (forthcoming) • Hardcover • \$149.00

Principles of Modern Radar: Advanced Techniques is a professional reference for practicing engineers that provides a stepping stone to advanced practice with in-depth discussions of the most important application areas in current radar practice. It provides an introduction to advanced radar methods, spanning the gamut of the most exciting radar capabilities and providing concise descriptions of the purposes, principal issues, and radar methods found in a wide variety of current radar types.

CONTENTS

Overview • Advanced Waveform Techniques • Optimal and Adaptive Multidimensional Waveform Design • MIMO Radar • Spectrum Considerations and Management • Compressive Sensing • Stripmap SAR Algorithms • Spotlight SAR Algorithms • Interferometric SAR • Adaptive Digital Beamforming • Clutter Suppression Using STAP • Advanced STAP Methods • Space-time Coding for Active Antenna Systems • Electronic Protection • Radar Polarimetry • Radar Automatic Target Recognition • Multitarget Tracking



FOLIAGE PENETRATION RADAR

By Mark E. Davis

ISBN 978-1-891121-00-5 • 320 pp. • ©2011
Hardcover • \$115.00

This book covers all aspects of foliage penetration (FOPEN) radar, concentrating on both airborne military radar systems as well as earth resource mapping radars. It is the first concise and thorough treatment of FOPEN, covering the results of a decade-long investment by DARPA in characterizing foliage and earth surface with ultrawideband UHF and VHF synthetic aperture radar (SAR).

CONTENTS

History of Battlefield Surveillance • Foliage Penetration SAR Collection Systems • Foliage Penetration Phenomena • FOPEN SAR Image Formation • Radio Frequency Interference Suppression • FOPEN Target Detection and Characterization • FOPEN SAR Design • FOPEN Ground Moving Target Indication • Bistatic FOPEN SAR



POCKET RADAR GUIDE

By G. Richard Curry

ISBN 978-1-891121-08-1 • 24 pp. • ©2010
Spiral Bound • \$14.95

The *Pocket Radar Guide* is a concise collection of key radar facts and important radar data that provides you with the necessary information when you are away from your office or references.



ELECTRONIC WARFARE POCKET GUIDE

By Dave Adamy

ISBN 978-1-891121-61-6 • 32 pp. • ©2011
Spiral Bound • \$16.95

The *Electronic Warfare Pocket Guide* is the perfect companion for any user that needs to access key definitions, concepts, and equations for their work in the field, lab, or even in military theater of operations.

CONTENTS

EW Definitions and Subareas • Frequency • Antennas • Radio Propagation • Receiver Sensitivity • Effective Range • Communication Jamming • Communications Electronic Protection • Jamming LPI Communications • Radar Characteristics • Radar Jamming • Radar Electronic Protection • Expendable Countermeasures • Decoys • Decibels (dB) • Graph & Nomograph Instructions • List of Symbols in Formulas • List of Abbreviations

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RADAR ESSENTIALS: A CONCISE HANDBOOK FOR RADAR DESIGN AND PERFORMANCE ANALYSIS

By G. Richard Curry

ISBN 9781613530078 • 128 pp. • ©2012 (Sept. 2011) • Spiral Bound • \$39.95

When you need vital data fast, turn to Radar Essentials. This compact yet comprehensive reference has compiled the most used principles, data, tables, and equations that are used by radar and aerospace system designers on a daily basis.

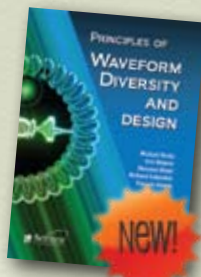
Experts and non-experts alike will find this to be their go-to source for recalling and understanding the fundamentals and employing them in design and performance analysis. Inside and out, this book is designed for constant use. While the interior contains all the most critical information radar engineers need, the compact size (5x8), lay-flat binding, and sturdy cover material allow for portability, ease of use, and long life off the shelf.

KEY FEATURES

- Discussion of principles, design, and operation including radar functions, types, frequencies, configurations and nomenclature.
- Characteristics and capabilities of key subsystems.
- Radar performance evaluation techniques and data.
- Discussion and data on the radar environment.
- Radar techniques including waveform design, moving-target indication (MTI), displaced phase-center arrays (DPCA), pulse Doppler operation, target classification, discrimination and identification.

CONTENTS

Radar Basics • Radar Subsystems • Radar Performance • Radar Environment • Radar Techniques • Computation Aids • Symbols • Glossary



PRINCIPLES OF WAVEFORM DIVERSITY AND DESIGN

Edited by Michael Wicks et al

ISBN 978-1-891121-95-1 • 1260 pp. • ©2011
Hardcover • \$189.00

This is the first book to discuss current and future applications of waveform diversity and design in subjects such as radar and sonar, communications systems, passive sensing, and many other technologies. It enables solutions to problems with how each system performs its own particular function as well as how it is affected by other systems and how those other systems may likewise be affected.

KEY FEATURES

- An excellent standalone introduction to waveform diversity and design.
- Takes a high potential technology area and makes it visible to other researchers and young engineers.
- Documents the beginnings and applications (current and future).



PULSE DOPPLER RADAR

By Clive Alabaster

ISBN 978-1-891121-98-2 • 350 pp. • June 2012
(forthcoming) • Hardcover • \$135.00

This “practitioners guide” covers all aspects of pulse Doppler radar, concentrating on airborne military radar systems as they are the most complex and interesting systems. However, it also covers ground-based and commercial systems as well. It covers the fundamental science, signal processing, hardware issues, system design and

provides case studies of typical systems. It is a useful resource for a wide audience including: hardware, software, and system design engineers; academics and post-graduate students; scientists in the radar and radar electronic warfare sectors; and military staff.

CONTENTS

Basic Concepts • Radar Hardware • Pulse Doppler Processing • High PRF Pulse Doppler Radar • FMICW Ranging in High PRF • Introduction to Medium PRF • Seven Factors Affecting the Choice of PRFs • Medium PRF Schedule Design • Detection Performance • Methods of PRF Selection • Case Studies



TEST AND EVALUATION OF AIRCRAFT AVIONICS AND WEAPON SYSTEMS

By Robert B. McShea

ISBN 978-1-891121-90-6 • 800 pp. • ©2010
Hardcover • \$149.00

This book is a compilation of experiences and methods from over 25 years in the business. It is an invaluable companion to the fighter or heavy aircraft test team, no matter their geographical location.

Lessons learned, good and bad, are addressed in each chapter so readers can avoid the pitfalls common to test and evaluation of these systems. Exercises at the end of each chapter provide instructors with the ability to reinforce critical concepts and all the “war stories” in the book are true.

Whether you are training pilots and personnel or actually planning to test systems, this book will provide you with the fundamentals and practical information you need to get the job done.



PHASED ARRAY RADAR DESIGN

By Tom Jeffrey

ISBN 978-1-891121-69-2
320 pp. • ©2009
Hardcover • \$89.00

A concise yet complete treatment of the relationship between mission-level requirements and specific hardware and software requirements and capabilities. Provides a “hands-on” and “how to” perspective on applying radar theory to design and analysis.



FUNDAMENTALS OF GROUND RADAR FOR ATC ENGINEERS AND TECHNICIANS

By Ronald Bouwman

ISBN 978-1-891121-75-3
515 pp. • ©2009
Hardcover • \$129.00

This is THE standard reference for FAA and military ATC engineers and maintenance technicians. It is a training text and long-term reference that provides answers for daily tasks and helps allay cost increases and waste.

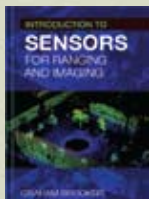


DESIGN OF MULTI-FREQUENCY CW RADARS

By Mohinder Jankiraman

ISBN 978-1-891121-56-2
350 pp. • ©2007
Hardcover • \$129.00

This work represents the first time that the topic of multi-frequency radars is discussed in such detail. It provides the design tools needed for development, design, and analysis of high resolution radar systems for commercial as well as military applications.



INTRODUCTION TO SENSORS FOR RANGING AND IMAGING

By Graham Brooker

ISBN 978-1-891121-74-6
740 pp. • ©2009
Hardcover • \$119.00

Provides a solid background in active sensing technology at an accessible level for non-specialists and managers. Beginning with signal generation, followed by radiometry; the core focus is on active sensing, starting with the basics of time-flight sensors through the derivation of the radar range equation.

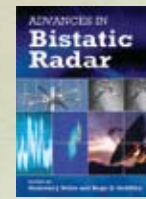


RADAR PRINCIPLES FOR THE NON-SPECIALIST, 3E

By Major General J.C. Toomay and Paul J. Hannen

ISBN 978-1-891121-28-6
294 pp. • ©2004
Paperback • \$59.00

Our #2 most popular radar textbook, this third edition continues the popular tradition of distilling the very complex technology of radar into its fundamentals, tying them to the laws of nature on one end and to the most modern and complex systems on the other. This text is used in academia, but finds its real home in military institutions needing to teach the basics of radar to new students.

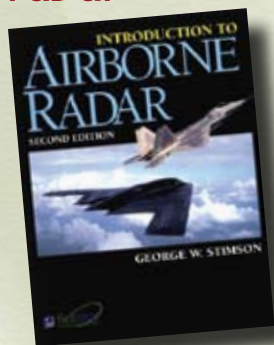


ADVANCES IN BISTATIC RADAR

Edited by Nicholas J. Willis and Hugh D. Griffiths

ISBN 978-1-891121-48-7
494 pp. • ©2007
Hardcover • \$149.00

This volume updates readers on the new developments in bistatic radar since 1990. It covers military and civil applications that had not been detailed in the past. It consists of two major sections: Bistatic/Multistatic Radar Systems, and Bistatic Clutter and Signal Processing. It is written by leading bistatic radar experts and edited by two of the leading researchers/engineers in the field.



INTRODUCTION TO AIRBORNE RADAR, 2ND EDITION

By George W. Stimson

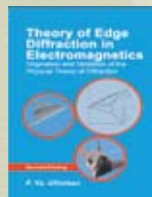
ISBN 978-1-891121-01-2 • 584 pp. • ©1998 • Hardcover • \$149.00 (ADD E-BOOK ON CD-ROM FOR ONLY \$50.00)

An all-time favorite among engineers, managers and pilots for its accessible level and graphical full color format. Presents the basics in 14 chapters and builds on that knowledge to present systems, specific radars, countermeasures, counter-countermeasures, and emerging technologies and applications. Anything mathematical or complex is set off in a blue box that can be skipped by the reader, while “side notes” in the margins provide helpful comments and caveats.

“Few books receive the title of ‘bible’ of their discipline, and Stimson’s book on radar is just that. Whether new to radar or EW, or an old sage needing a quick review, Stimson is the ‘must have’ volume for your library.” - *Dr. Patrick J. Ford, Dean, School of Science & Technology - American Military University*

HELP US CREATE THE 3RD EDITION OF INTRODUCTION TO AIRBORNE RADAR.

We are asking the worldwide tribe of radar experts to help us generate a “community-built” third edition of Stimson. Trying to create a third edition which upholds the tradition and yet expands the book enough to generate significant interest requires the help of a worldwide collection of experts. Please let us know if you are interested in becoming a member of our Stimson Tribe by sending an email to Heather Mercer at (hmercerc@scitechpub.com).



THEORY OF EDGE DIFFRACTION IN ELECTROMAGNETICS

By Pyotr Ufimtsev

ISBN 978-1-891121-66-1
444 pp. • ©2009
Hardcover • \$99.00



LOW-ANGLE RADAR LAND CLUTTER

By Pyotr Ufimtsev

ISBN 978-1-891121-16-6
750 pp. • ©2002
Hardcover • \$149.00



RADAR FOUNDATIONS FOR IMAGING AND ADVANCED CONCEPTS

By Roger J. Sullivan

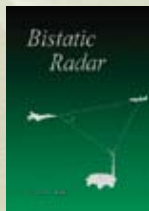
ISBN 978-1-891121-22-7
476 pp. • ©2004
Paperback • \$105.00



AIRBORNE EARLY WARNING SYSTEM CONCEPTS, 3E

By Maurice W. Long

ISBN 978-1-891121-32-6
476 pp. • ©2004
Paperback • \$115.00



BISTATIC RADAR, 2E

By Nicholas J. Willis

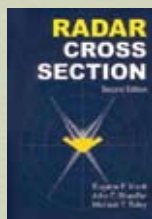
ISBN 978-1-891121-45-6
329 pp. • ©2005
Paperback • \$89.00



INTRODUCTION TO RF STEALTH

By David D. Lynch, Jr.

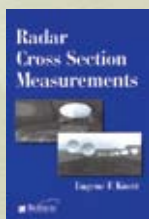
ISBN 978-1-891121-21-0
560 pp. • ©2004
Hardcover • \$139.00



RADAR CROSS SECTION, 2E

By Eugene F. Knott, Michael T. Tuley, John F. Shaeffer

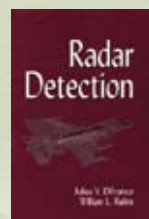
ISBN 978-1-891121-25-8
611 pp. • ©2004
Paperback • \$109.00



RADAR CROSS SECTION MEASUREMENTS

By Eugene F. Knott

ISBN 978-1-891121-55-5
546 pp. • ©2006
Hardcover • \$115.00



RADAR DETECTION

By J.V. Difrancia and W.L. Rubin

ISBN 978-1-891121-36-4
654 pp. • ©2004
Paperback • \$115.00

INTRODUCTION TO ADAPTIVE ARRAYS, 2E

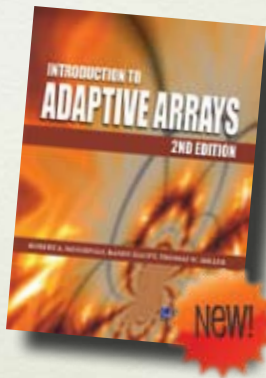
By Robert A. Monzingo, Randy Haupt, Thomas W. Miller

ISBN 978-1-891121-57-9 • 600 pp. • ©2011 • Hardcover • \$129.00

This second edition is an extensive modernization of the bestselling introduction to the subject of adaptive array sensor systems. With the number of applications of adaptive array sensor systems growing each year, this look at the principles and fundamental techniques that are critical to these systems is more important than ever before.

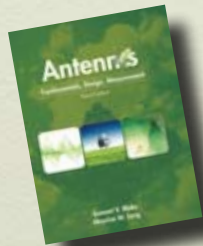
Introduction to Adaptive Arrays, 2nd Edition is organized as a tutorial, taking the reader by the hand and leading them through the maze of jargon that often surrounds this highly technical subject. It is easy to read and easy to follow as fundamental concepts are introduced with examples before more current developments and techniques are introduced.

Problems at the end of each chapter serve both instructors and professional readers by illustrating and extending the material presented in the text. Both students and practicing engineers will easily gain familiarity with the modern contribution that adaptive arrays have to offer practical signal reception systems.



CONTENTS

Introduction • Adaptive Array Concept • Optimum Array Processing • Gradient-Based Algorithms • Direct Inversion of the Sample Covariance Matrix • Recursive Methods for Adaptive Array Processing • Cascade Preprocessors • Random Search Algorithms • Random Search Algorithms • Compensation of Adaptive Arrays • Direction of Arrival • Extensions • Appendices



ANTENNAS: FUNDAMENTALS, DESIGN, MEASUREMENT, 3E (STANDARD)

By Lamont Blake and Maurice W. Long

ISBN 978-1-891121-78-4 • 524 pp. • ©2009

Hardcover • \$99.00

This comprehensive revision is a senior undergraduate or first-year graduate level textbook on antenna fundamentals, design, performance analysis and measurements. In addition to its use

as a formal course textbook, the book's pragmatic style and emphasis on the fundamentals make it especially useful to engineering professionals who need to grasp the essence of the subject quickly but without being mired in unnecessary detail.

CONTENTS

Electromagnetic Waves • Transmission Lines • Antenna Parameters • Basic Radiators and Feed Methods • Arrays • Reflectors and Lenses • Antennas with Special Properties • Electronically Steered Arrays • Antenna Measurements • Appendices (8)



ANTENNAS: FUNDAMENTALS, DESIGN, MEASUREMENT, 3E (DELUXE)

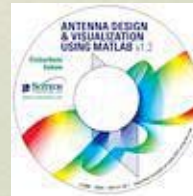
By Lamont Blake and Maurice W. Long

ISBN 978-1-891121-78-4 • 524 pp. • ©2009

Hardcover • \$149.00

This deluxe edition contains the same information as the standard (see above) but with one exciting difference. This edition includes a full-featured single-user copy of Mathcad 14.0 for **only an additional \$50** over the price of the standard edition. Take a look online and see what kind

of savings we're giving you here. Perfect for using the downloadable Mathcad files that support the text!



ANTENNA DESIGN AND VISUALIZATION USING MATLAB (V. 2.0 WITH SOURCE CODE)

By Atef Elsherbeni and Matthew J. Inman

ISBN 978-1-891121-94-4 • Software • ©2009

CD-ROM • \$89.00

This program allows for the design and visualization of both single elements and of arrays of common elements based on assumed, known, or user-

provided patterns. The visualization options in the program allow for inspection of the radiation pattern in full 3D or in multiple 2D and 3D plane cuts. It is an interactive program for the visualizing, designing and synthesizing antennas and associated arrays.



MICROSTRIP AND PRINTED ANTENNA DESIGN, 2E

By Randy Bancroft

ISBN 978-1-891121-73-9 • 300 pp. • ©2009

Hardcover • \$99.00

This is a complete introduction to useful, elegant microstrip antenna designs that may be engineered unlike many other design. It provides practical suggestions for solving difficulties encountered in physical designs (e.g. shorting pin in center of patch for ESD, use of small strips on either side of pin to provide stress relief from shock/vibration. It also provides an extensive section on the design of omni-directional microstrip antennas and demystifies basic PIFA designs and expends on their limitations. Generally ignored by other books, the subject of Electrically Small Antenna (ESA) Limits is covered generously in this title.

See "Training" for Antennas Tutorial Videos



MICROWAVE AND RF DESIGN: A SYSTEMS APPROACH

By Michael Steer

ISBN 978-1-891121-88-3 • 980 pp. • ©2010 • Hardcover • \$125.00

This is a graduate level textbook that can be used for a single or multiple courses in microwave and radio frequency design. The systems first approach ensures that students are truly prepared to enter industry with knowledge of designing for “the whole,” instead of just parts. However, this does not mean that components are ignored. The book is arranged in five modules that are independent but do built upon each other and are best taught/read in sequence. Design examples are used throughout the book, and many of them incorporate design tradeoffs that are only appreciated in the context of a specific design. As of January 2011, this textbook is used by over 30 programs.

Despite being written as a textbook, practicing engineers have found this a highly valuable resource with in-depth analysis of modern microwave components and subsystems; as well as how to develop and refine the techniques required to achieve competitive designs.

TABLE OF CONTENTS

system module - Modulation, Transmitters & Receivers • Antennas & RF Link • Radio Frequency Systems • **transmission line module** - Transmission Lines • Extraordinary Transmission Line Effects • **network module** - Microwave Network Analysis • Passive Components • Impedance Matching • **coupled line and filter module** - Coupled Lines and Applications • Filters • **active device and synthesis module** - Amplifiers • Mixers, Switches, and Oscillators • Appendices (5)



RF AND MICROWAVE MODELING AND MEASUREMENT TECHNIQUES FOR FETS

By Jianjun Gao

ISBN 978-1-891121-89-0

350 pp. • ©2010

Hardcover • \$109.00

An introduction to microwave and RF signal modeling and measurement techniques for field effect transistors. It assumes only a basic course in electronic circuits and prerequisite knowledge for readers to apply the techniques and improve the performance of ICs, reduce design cycles and increase their chance at first time success.



MULTIFUNCTIONAL ADAPTIVE MICROWAVE CIRCUITS AND SYSTEMS

Edited by Michael Steer and W. Devereaux Palmer

ISBN 978-1-891121-77-7

410 pp. • ©2009

Hardcover • \$139.00

This book is a systematic approach to the system level design requires to develop MARRS technology. It is a state-of-the-art survey that summarizes the findings of a five year project on Multifunctional Adaptive Radio Radar and Sensors that ran from 2001 to 2006.



TRANSCIVER AND SYSTEM DESIGN FOR DIGITAL COMMUNICATIONS

By Scott R. Bullock

ISBN 978-1-891121-72-2

409 pp. • ©2009

Hardcover • \$109.00

This book provides an understanding of concepts in wireless, data link, and digital communication techniques for both commercial and military sectors. It covers digital modulation, spread spectrum modulation, link budgets, error detection and correction as well as all of the elements that make up a digital modulated data link.



WIDEBAND AMPLIFIER DESIGN

By Allen L. Hollister

ISBN 978-1-891121-51-7

391 pp. • ©2007

Hardcover • \$135.00

This book presents the theory needed to understand wideband amplifier design using the simplest models possible. The theory can be used to develop algebraic equations that describe particular circuits used in high frequency design so that the reader develops a “gut-level” understanding of the process and the circuit.



FIBER OPTIC TECHNOLOGY

By Asu Ram Jha

ISBN 978-1-88432-60-1

306 pp. • ©2005

Hardcover • \$89.00

Many technologies which benefit from fiber optics are included in this book including commercial, industrial, military, and space optical systems. The author avoids complex mathematics and derivations, but he offers the equations necessary to eloquently describe fiber optic components and systems.



THE RF/MICROWAVE LIBRARY

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WIRELESS RECEIVER DESIGN FOR DIGITAL COMMUNICATIONS, 2ND EDITION

By Kevin McClaning

ISBN 978-1-891121-80-7 • 550 pp. • ©2011 (August) • Hardcover • \$139.00

Decades of “at the bench” experience are collected within this book, providing readers with practical lessons and approaches in radio receiver design for wireless communication systems. Starting with the “Basics of RF Engineering” this is a virtual replacement for a mentor sharing his knowledge and walking his apprentice along the path toward the design of real world systems.

Wireless Receiver Design for Digital Communications, 2nd Edition is a complete modernization (and necessary re-titling) of the bestselling *Radio Receiver Design*, published over a decade ago and authored by Kevin McClaning and Tom Vito. It serves as a reference for professional electrical engineers; while chapter-end exercises for each chapter facilitates use as a Master’s level textbook in Communication Engineering courses. It is replete with proven concepts, illustrations, design examples, and exercises that help clarify the role of each component within the system design.

CONTENTS

Introduction and Background • Signals and Noise • Propagation • Antennas • Filters • Amplifiers and Noise • Linearity • Mixers • Oscillators • Cascades • Digitizing - A/D and D/A Converters • Demodulation

SMALL SIGNAL AMPLIFIER DESIGN: A COLLECTION FROM AMW MAGAZINE

ISBN 978-1-884932-24-3 • 104 pp. • ©2002
Paperback • \$29.00

FILTERING IN THE TIME AND FREQUENCY DOMAINS

By Herman J. Blinichkoff and Anatol I. Zverev

ISBN 978-1-884932-17-5 • 520 pp. • ©2001
Hardcover • \$95.00

RADIO-ELECTRONIC TRANSMISSION FUNDAMENTALS, 2E

By B. Whitfield Griffith, Jr.

ISBN 978-1-884932-13-7 • 648 pp. • ©2000
Hardcover • \$95.00

RF POWER AMPLIFIERS

By Mihai Albulet

ISBN 978-1-884932-12-0 • 376 pp. • ©2001
Hardcover • \$95.00

TRANSMISSION LINE TRANSFORMERS, 4E

By Jerry Sevick

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By Joseph F. White

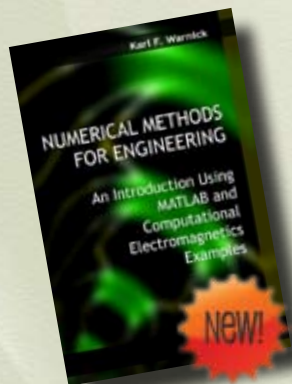
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ELECTROMAGNETICS



NUMERICAL METHODS FOR ENGINEERING: AN INTRODUCTION USING MATLAB AND COMPUTATIONAL ELECTROMAGNETICS

By Karl F. Warnick

ISBN 978-1-891121-99-9 • 300 pp. • ©2011 • Hardcover • \$79.00

This textbook teaches students to create computer codes used to engineer antennas, microwave circuits, and other critical technologies for wireless communications and other applications of electromagnetic fields and waves. Worked code examples are provided for MATLAB technical computing software.

It is the only textbook on numerical methods that begins at the undergraduate engineering student level but bring students to the state-of-the-art by the end of the book. It focuses on the most important and popular numerical methods, going into depth with examples and problem sets of escalating complexity.

This book requires only one core course of electromagnetics, allowing it to be useful both at the senior and beginning graduate levels. Developing and using numerical methods in a powerful tool for students to learn the principles of intermediate and advanced electromagnetics. This book fills the missing space of current textbooks that either lack

depth on key topics (particularly integral equations and the method of moments) and where the treatment is not accessible to students without an advanced theory course. Important topics include: Method of Moments; Finite Difference Time Domain Method; Finite Element Method; Finite Element Method-Boundary Element Method; Numerical Optimization; and Inverse Scattering.



ELECTROMAGNETIC FIELD MEASUREMENTS IN THE NEAR FIELD, 2E

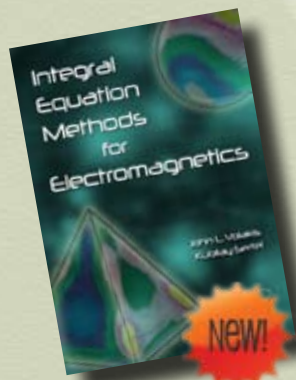
By Hubert Trzaska and Pawel Bienkowski

ISBN 978-1-891121-06-7 • 230 pp. • ©2011 (August) • Hardcover • \$89.00

This book is devoted to the electromagnetic field (EMF) measurements in the aspect of labor safety and environmental protection. A specificity of the measurements is their performing in close proximity of radiation sources, in the near field. The book is addressed to wide range of specialists in biology, medicine, labor safety, environmental protection, and metrology; as well as EMF meter designers, testers and users, and even for lawyers involved in the area.

CONTENTS

Introduction • The Near Field and the Far Field • EMF Measurement Methods • Electric Field Measurement • Magnetic Field Measurement • Power Density Measurement • Directional Pattern Synthesis • Other Factors Limiting Measurement Accuracy • Photonic EMF Measurements • Final Comments



INTEGRAL EQUATION METHODS IN ELECTROMAGNETICS

By John L. Volakis and Kubilay Sertel

ISBN 978-1-891121-93-7 • 550 pp. • ©2012 (December - 2011) • Hardcover • \$135.00

This is a comprehensive text/reference that covers the workhorse of electromagnetic analysis, integral equation methods. Integral equation methods are used, in general, for wireless communication components and more specifically for antennas, microwave circuits, and radar scattering. It is the main method in carrying out design of radio frequency front ends for the cell phone industry, wireless sensors, radar imaging, and radar identification to mention a few.

This book is a comprehensive approach to the understanding and utility of integral equation methods for both developers and practitioners. In other words, it doesn't just focus on the steps of implementing a method; it also details the reasoning behind each method so professionals can evaluate its applicability to a specific problem they are facing. Students and self-studying practitioners will benefit from extensive homework problems that expand the coverage of topics in each chapter.

ELECTRONIC SYSTEM DESIGN FOR EMC

By William Duff

ISBN 978-1-891121-42-5 • 275 pp. • ©2011 • Hardcover • \$95.00

This book is written to provide a solid understanding of electromagnetic interference (EMI) and electromagnetic compatibility (EMC) techniques for mitigating these problems. It teaches the proper conditions for effective electronic system performance; in other words, the ability of equipments and systems to function as intended in their operational environment without adversely affecting the operation of (or being affected adversely by) other equipment or systems.

CONTENTS

Introduction to Electronic System Design for EMC • Basic Terms and Definitions • Communication Systems EMC • Electronic System Design for EMC • Grounding for the Control of EMI • Shielding Theory, Materials, and Protection Techniques • Bonding • Ferrites, Isolators, and Transient Suppressors • Cables and Connectors • Summary of EMI Control Techniques

THE WIENER-HOPF TECHNIQUE IN ELECTROMAGNETICS

THE MARIO BOELLA SERIES ON ELECTROMAGNETISM IN INFORMATION & COMMUNICATIONS

By Vito G. Daniele and Rodolfo F. Zich

ISBN 978-1-61353-001-6 • 250 pp. • September 2012 (forthcoming) • Hardcover • \$85.00

This is a comprehensive introduction to the Wiener-Hopf technique and is a fundamental book for those interested in this powerful method of solving diffraction field problems. At its core are the very latest developments, making this the most up-to-date book on the market. The first part of the book is devoted to the mathematical aspects of the Wiener-Hopf technique, while the second part is dedicated to illustrating the the aims and power of the theory via application problems. The book is written for readers primarily interested in the ideas and the possible applications of the presented methods.

CONTENTS

Wiener-Hopf Equations Forms • Fundamental Idea for Solving Wiener-Hopf Equations • Functions Decomposition and Factorization • Exact Matrix Factorization • Approximate Solution Techniques: The Fredholm Factorization • Approximate Solution Techniques: Some Particular Techniques • The Half-Plane Problem • Planar Discontinuities in Stratified Media • Wiener-Hopf Analysis of Waveguide Discontinuities • Further Applications of the Wiener-Hopf Technique

INTRODUCTION TO MODERN DIGITAL ELECTRONICS

By Charles Hawkins and Jaume Segura

ISBN 978-1-891121-07-4 • 417 pp. • ©2010
Hardcover • \$79.00

Introduction to Modern Digital Electronics is an undergraduate textbook for electrical and computer engineering students that is dedicated solely to digital CMOS electronics. It covers the same topics and graduate level textbooks, but in an introductory style specifically crafted (and course tested) for undergraduates. Students

will not need a prerequisite in analog electronics, allowing instructors flexibility in course scheduling. While there are several textbooks which cover both analog and digital electronics and are used for both courses, their digital modules continue to focus on outdated bipolar and NMOS logic which is no longer used in industry.

FUNDAMENTALS OF WAVE PHENOMENA, 2E

By Akira Hirose and Karl Lonngren

ISBN 978-1-891121-92-0 • 450 pp. • ©2010
Hardcover • \$75.00

This textbook is written for use in any university course related to the physics of waves, wave theory, and electromagnetic waves in departments such as Physics, Electrical Engineering, Mechanical Engineering, Civil Engineering, and Mathematics. The only prerequisite knowledge is a course in calculus.

This textbook provides a unified treatment of waves that either occur naturally or can be excited and propagate in various media. This includes both longitudinal and transverse waves. The book covers both mechanical and electrical waves, which are normally covered separately due to their differences in physical phenomena.

ELECTROMAGNETICS



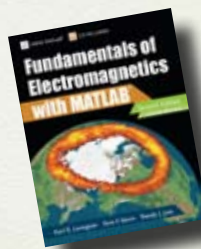
THE FINITE TIME DIFFERENCE TIME DOMAIN METHODS FOR ELECTROMAGNETICS: WITH MATLAB SIMULATIONS

By Atef Elsherbeni and Veysel Demir
ISBN 978-1-891121-71-5 • 500 pp. • ©2009
Hardcover • \$129.00

This book presents the fundamental techniques in the FDTD method. In each chapter, the details of concepts are discussed at a graduate student level. Using it, students will be able to construct a program with sufficient functionality to solve some basic problems. The construction of final equations is presented with a detailed step-by-step approach. In most cases the full set of equations are provided. The book presents the construction of equations accompanied by a nice set of 3D illustrations which greatly enhance the understanding of the concepts.

While the concepts are being presented, it has been kept in mind that the outcome of the book will be a software package sufficient to solve several types of basic electromagnetic problems. In each chapter, the transformation of the concepts into programming is explained. Therefore the chapters are presented in such a way that, by adding/developing a new part of the code, chapter by chapter, at the end a well developed FDTD simulation package will be constructed.

SOLUTIONS MANUAL IS AVAILABLE for \$29.00.



FUNDAMENTALS OF ELECTROMAGNETICS WITH MATLAB, 2E

By Karl Lonngren, Sava Savov, Randy Jost
ISBN 978-1-891121-58-6 • 576 pp. • ©2007
Hardcover • \$119.00

Fundamentals of Electromagnetics with MATLAB, 2nd Edition is much more than a mere textbook. The book itself offers a structural framework of principles, key equations, and problems. With that crucial supporting structure, each instructor, student or reader can turn to the supplemental files provided with this book or available online to customize and decorate each topic room.

This second edition is the result of extensive user feedback and includes a 100% standalone Transmission Line chapter for flexible course placement; expanded problem sets matched to text sections and checked for clarity; and separate chapters for Electrostatics and Magnetostatics. The attractive 2-color design, tight page design and new paper make this a more compact, lay-open book that is also \$20-35 below the competition.

CONTENTS

MATLAB and Vectors • Electrostatic Fields • Magnetostatic Fields • Boundary Value Problems Using MATLAB • Time-Varying Electromagnetic Fields • Electromagnetic Wave Propagation • Transmission Lines • Radiation of Electromagnetic Waves • Appendices

SENSORS



INTRODUCTION TO SENSORS AND ACTUATORS

By Nathan Ida
ISBN 978-1-61353-006-1 • 600 pp. • June 2012 (forthcoming) • Hardcover • \$119.00

This textbook is intended as the basis for an elective course in sensors and actuators. It is discipline independent so it can serve as the basis of a course in any engineering discipline. It can also serve as the basis of training in industry or, for that matter in community colleges as the approach is practical and uses only simple analytical tools. Many of the discussions within have to do with mechanics, chemistry and general physics, and the traditional allocation of electronics, particularly microprocessors, to electrical engineering is not as clear-cut as it was in the past.

Electrical engineers are often called upon to work with mechanical systems (robotics, vehicles, etc.), mechanical engineers need to be able to integrate electronic systems, chemical and civil engineers as well are called upon to design and integrate sensors of increasing complexity; many of which are electrical with associated electronics. Biomedical engineers find that they must not only understand the principles of a bewildering array of sensors, but also the electronics behind them. This textbook is the foundation for students in all these disciplines.

CONTENTS

Introduction • Performance Characteristics of Sensors and Actuators • Optical Sensors • Temperature Sensors • Magnetic and Electromagnetic Sensors and Actuators • Mechanical Sensors • Acoustic Sensors and Actuators • Chemical Sensors • Radiation Sensors • Additional Topics • Interfacing Methods and Circuits • Interfacing to Microprocessors

MATLAB FOR ELECTRICAL AND COMPUTER ENGINEERS

By Roland Priemer

ISBN 978-1-891121-76-0 • 450 pp. • June 2012 (forthcoming) • Hardcover • \$59.00

This textbook is targeted toward lower division (freshman and sophomore) Electrical and Computer Engineering students, as well as other MATLAB beginners. Its goal is to teach how MATLAB can be used to solve problems in Electrical and Computer Engineering by using examples and problem sets specifically relevant to EE and CE. The book is written to be user-friendly and discusses in detail the aspects of MATLAB that are most important, and using example problems that will show EE and CE users why MATLAB is important and where it will be used throughout their college and professional careers.

CONTENTS

MATLAB Environment • Programs and Functions • Matrices, Vectors and Scalars • Program Flow Control • Logic Data Type • Complex Data Type • Graphics • Debugging • Input/Output • MATLAB for Signal Processing • MATLAB for Linear Systems Analysis • Symbolic Math

THE FINITE DIFFERENCE TIME DOMAIN: A PROGRAMMER'S PERSPECTIVE

By Nordin Zakaria

ISBN 978-1-61353-004-7 • 300 pp. • June 2012 (forthcoming) • Hardcover • \$95.00

This book is targeted towards programmers or programming-oriented FDTD learners who may or may not have an engineering background and who are faced with the task of developing an electromagnetic simulation application for a real engineering project. The required math is explained fully, giving the reader an informal description of the meaning of every symbol, how every derivation step is made, and the “thinking” behind the steps and the flows. It builds up FDTD concepts and implementation competency gradually, chapter after chapter. Program details are given in the form of full source codes, or partial source codes that the reader should be able to fill in. The only background required is a working knowledge of C/C++ and basic calculus. The book is written as a companion guide to *The Finite Difference Time-Domain Methods for Electromagnetics* (Elsherbini & Demir) published by SciTech (see previous page).

CONTENTS

Maxwell's Equation • Finite Different Time-Domain Method • OpenGL for 2D FDTD Visualization • Perfectly Matched Layer • Voxelization • 3D Visualization • Plane Waves • High Performance Computing • Far-Field Computation

INTRODUCTION TO BIOMECHANICS

By Graham M. Brooker

ISBN 978-1-891121-27-2 • 600 pp.

©2012 (February) • Hardcover • \$135.00

Introduction to Biomechanics provides biomedical engineering instructors with a single resource that explains in straightforward terms all of the aspects of mechatronics that undergraduate students need to become competent in the field. This includes sensing and actuation as well as signal processing and classical control; all from a biological perspective.

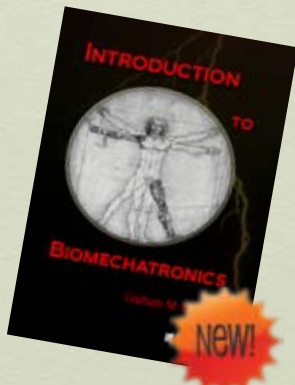
It fully discusses five broad based biomechatronic inventions with historical significance. By providing a complete analysis of these inventions focused on hearing, sight, respiration, circulation, and locomotion; students will be both informed and inspired to design the newest successors to these biomechatronic inventions that have changed millions of lives.

CONTENTS

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APPLIED MATH & PROGRAMMING

BIOMEDICAL ENGINEERING





FUNDAMENTALS OF SYSTEMS ENGINEERING: REAL-WORLD APPLICATIONS

By Thomas Jeffrey

ISBN 978-1-61353-008-5 • 250 pp. • June 2012 (forthcoming) • Hardcover • \$89.00

This book is a “user-guide” for both new and experience practicing systems engineers to execute fundamental systems engineering on real programs. The focus of the book is not on theory, but on using proven and tailorable practices, processes, and procedures that set the stage for the subsequent subsystem design, integration, and test phases of typical programs. This approach also applied to independent research and development, prototype, and demonstration efforts.

The book makes liberal use of examples and case studies to clearly, concisely, and completely illustrate the various facets of systems engineering. Although general in nature, most of the experience based learning is based on the author performing electronic system design and development for the Department of Defense and other government entities such as the Federal Aviation Administration and the Department of Homeland Defense. However, the fundamental principles remain the same, even though the focus and duration of certain phases of development might differ in pure research or commercial endeavors.

CONTENTS

What is Systems Engineering? • Phases of Systems Engineering • System Trade Studies • Performance-Driven Requirements • System Performance Evaluation • Architecting Process • Program Complexity Evaluation • Use of Leading Indicators • System Engineering Tools • Case Studies

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