ENGINEERING
Electrical, Electronics, Fire Safety
Optics and Optical

PHI Learning’s Eastern Economy Editions (3Es) consist of outstanding works of Indian authors and unabridged reprints of established titles widely used by universities. These lower priced editions are published for the benefit of students.
Contents

ELECTRICAL AND ELECTRONICS ENGINEERING ................................................................. 3
FIRE SAFETY ENGINEERING .......................................................................................... 79
OPTICS AND OPTICAL ENGINEERING ......................................................................... 80
AUTHORWISE ALPHABETICAL LISTING ...................................................................... 82
WHOLESAVERS AND STOCKISTS ................................................................................ 87

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MAHESHWARI & ANAND

Analog Electronics

L.K. MAHESHWARI, Professor of Electronics and Instrumentation at Birla Institute of Technology and Science, Pilani. Presently, he also holds the position of Director of the Institute.

M.M.S. ANAND, Professor of Electronics and Instrumentation at Birla Institute of Technology and Science, Pilani. Presently, he also holds the position of Registrar of the Institute.

This text offers a comprehensive introduction to a wide, relevant array of topics in analog electronics. It is intended for students pursuing courses in electrical, electronics, computer, and related engineering disciplines.

Beginning with a review of linear circuit theory and basic electronic devices, the text moves on to present a detailed, practical understanding of many analog integrated circuits. The most commonly used analog IC to build practical circuits is the operational amplifier or op-amp. Its characteristics, basic configurations and applications in the linear and nonlinear circuits are explained. Modern electronic systems employ signal generators, analog filters, voltage regulators, power amplifiers, high frequency amplifiers and data converters. Commencing with the theory, the design of these building blocks is thoroughly covered using integrated circuits.

The development of microelectronics technology has led to a parallel growth in the field of Micro-electromechanical Systems (MEMS) and Nano-electromechanical Systems (NEMS). The IC sensors for different energy forms with their applications in MEMS components are introduced in the concluding chapter.

Several computer-based simulations of electronic circuits using PSPICE are presented in each chapter. These examples together with an introduction to PSPICE in an Appendix provide a thorough coverage of this simulation tool that fully integrates with the material of each chapter. The end-of-chapter problems allow students to test their comprehension of key concepts. The answers to these problems are also given.


Latest Print 2012 / 704 pp. / 17.8 × 23.5 cm
ISBN-978-81-203-2722-1 / ₹ 395.00

MAHESHWARI & ANAND

Laboratory Experiments and PSPICE Simulations in Analog Electronics

L.K. MAHESHWARI, Professor of Electronics and Instrumentation at Birla Institute of Technology and Science, Pilani. Presently, he also holds the position of Director of the Institute.

M.M.S. ANAND, Professor of Electronics and Instrumentation at Birla Institute of Technology and Science, Pilani. Presently, he also holds the position of Registrar of the Institute.

This laboratory manual for students of Electronics, Electrical, Instrumentation, Communication, and Computer engineering disciplines has been prepared in the form of a standalone text, offering the necessary theory and circuit diagrams with each experiment. Procedures for setting up the circuits and measuring and evaluating their performance are designed to support the material of the authors’ book Analog Electronics (also published by Prentice-Hall of India, 2005).

There are twenty-five experiments. The experiments cover the basic transistor circuits, the linear op-amp circuits, the active filters, the non-linear op-amp circuits, the signal generators, the voltage regulators, the power amplifiers, the high frequency amplifiers, and the data converters.

In addition to the hands-on experiments using traditional test equipment and components, this manual describes the simulation of circuits using PSPICE as well. For PSPICE simulation, any available standard SPICE software may be used including the latest version OrCAD V10 Demo software. This feature allows the instructor to adopt a single laboratory manual for both types of experiments.


3

Latest Print 2011 / 344 pp. / 17.8 × 23.5 cm ISBN-978-81-203-2927-0 / ₹ 250.00 / (e-book also available)

PITTET & KANDASWAMY (Eds.)
Analog Electronics

ANDRÉ PITTET, Chief Technical Advisor, Centre for Electronics Design and Technology (CEDT), Indian Institute of Science (IISc.), Bangalore.
A. KANDASWAMY, Professor and Dean, Department of Electrical Science, PSG College of Technology, Coimbatore.

The recent growth of industrial automation as well as wireless communication has made the Analog Electronics course more relevant in today’s undergraduate programmes. This well-written text offers a comprehensive introduction to the concepts of circuit analysis, electronic devices and analog integrated circuits. The primary aim of this textbook is to raise the analytical skills of students, required for the analysis and design of analog electronic circuits.

This book exposes the students to the current trends in Analog Electronics including the complete analysis and design of electronic circuit using Diodes, BJTs, FETs, MOSFETs, CMOS and operational amplifiers.

KEY FEATURES

- Presents various models/equivalent circuits of semiconductor devices required for analysis and simulations.
- Incorporates PSPICE™ modelling and simulation examples in each chapter.
- Each chapter starts with an Introduction and specific learning objectives, and concludes with a summary.
- Each chapter contains large number of worked-out examples, exercises and numerical problems.

Primarily intended for the undergraduate students of Electrical, Electronics, Communication and Computer Engineering, this book would also be useful to the practising engineers, who wish to update their knowledge in the area of Analog Electronics Circuit Design.


Latest Print 2009 / 376 pp. / 17.8 × 23.5 cm ISBN-978-81-203-2784-9 / ₹ 250.00 / (e-book also available)

Antennas

NEELAKANTA & CHATTERJEE

Antennas for Information Super Skyways: An Exposition on Outdoor and Indoor Wireless Antennas

PERAMBUR S. NEELAKANTA and RAJESWARI CHATTERJEE.

The primary goal of this book is to present the salient aspects of antenna principles and technology as related to modern wireless communications. It is written from a unique perspective, containing a mix of topics—theory, design and applications of outdoor and indoor antennas adopted in practical wireless communication systems. The scope of the book includes industry-oriented research, design and development aspects of wireless antennas.

It is also suitable as a course text for students at postgraduate and undergraduate levels.

KEY FEATURES OF THE BOOK:

- Addresses the latest, state-of-the-art aspects of both outdoor and indoor wireless antennas, accompanied by exhaustive illustrations and references.
- Provides a comprehensive guide to research and development staff working on design of wireless antennas.


Latest Print 2008 / 552 pp. / 15.3 × 22.9 cm ISBN-978-81-203-3668-1 / ₹ 395.00
YADAVA
Antenna and Wave Propagation
R.L. YADAVA, Professor in the Department of Electronics and Communication Engineering, Galgotias College of Engineering and Technology, Greater Noida, Uttar Pradesh.

This book is designed to serve as a text for BE/BTech students of Electronics and Communication Engineering and for MTech students of Communication Engineering. It provides a thorough understanding of the fundamentals and applications of the subject. The book discusses the properties of several types of antennas such as dipoles, loop, Yagi, log-periodic and microstrip antennas and lucidly explains the phenomenon of wave propagations with emphasis on theory of operation and design procedures. It provides a comprehension of the principles of radiation and methods of excitation. The book also focuses on antenna measurements along with necessary requirements and different methods of measurement.

Written in an easy-to-understand manner, the text includes several illustrative examples. A large number of solved examples and exercise problems with varying difficulty levels are included to reinforce the theoretical understanding of concepts. The book also contains several objective-type questions in each chapter. The Appendices provide a rich source of information and expressions as well as design data.


Latest Print 2011 / 746 pp. / 17.8 × 23.5 cm
ISBN-978-81-203-4291-0 / ₹ 525.00 / (e-book also available)

BOSE, PURI & BANERJEE
Modern Inertial Sensors and Systems
AMITAVA BOSE, Former Director, Indian Space Research Organisation and INAE Distinguished Visiting Professor.
K.N. BHATT, He has been at the Centre for Nanoscience and Engineering, Indian Institute of Science Bangalore, teaching courses on Nano devices and MEMS Technology.
THOMAS KURIAN, Dean R&D and Head of the Department of Avionics in Indian Institute of Space Science and Technology, Thiruvananthapuram.

Navigation fundamentally provides information on position, velocity and direction which are needed for travel in ocean, land, air and in space. This information has been extremely useful to the growth of civilization through the ages. It is quite expected that myriad forms of navigation developed during this long period leading to current versions which are collectively called modern navigation or simply 'navigation'. Navigation has different types, such as, inertial navigation, satellite navigation, radio navigation, stellar navigation, and integrated inertial navigation.

The book, fundamentals of navigation and inertial sensors, has focused on topics related to inertial navigation, inertial sensors, MEMS based inertial sensors, satellite navigation, integrated inertial navigation, signal processing of inertial sensors and lastly their applications. Besides being an ideal introduction to the topics, the book has aimed to meet the academic needs of undergraduate and postgraduate courses for students in aerospace engineering as well as in Avionics.


Latest Print 2014 / 312 pp. / 17.8 × 23.5 cm
ISBN-978-81-203-4859-2 / ₹ 425.00 / (e-book also available)

Avionics

BOSE, et al.
Fundamentals of Navigation and Inertial Sensors
AMITAVA BOSE, Former Director, Indian Space Research Organisation and INAE Distinguished Visiting Professor.
K.N. BHATT, He has been at the Centre for Nanoscience and Engineering, Indian Institute of Science Bangalore, teaching courses on Nano devices and MEMS Technology.
THOMAS KURIAN, Dean R&D and Head of the Department of Avionics in Indian Institute of Space Science and Technology, Thiruvananthapuram.

Modern inertial sensors and systems cover more than five decades of continuous research and development involving various branches of science and engineering. Various technologies have emerged in an evolutionary manner surpassing the earlier ones in performance and reliability. The subject is still growing with proliferation in newer cost effective applications, while its wider usage in aerospace systems continues.

This book exposes the readers to the subject of inertial navigation, the inertial sensors and inertial systems in a unified manner while emphasizing the growth areas in emerging technologies such as micro-electromechanical inertial sensors, satellite navigation, satellite navigation integrated inertial navigation, hemispherical resonator gyro, vibrating beam accelerometer, interferometric fibre optic gyro, inertial sensor signal processing, redundant inertial systems and the quite recent emergence of cold
atom interferometer based inertial sensors. The contents are imaginatively designed that will of interest to a wide spectrum of readers. The book has been written with utmost lucidity and clarity and explanations provided with a large number of illustrative figures.

Besides being an ideal introduction to the principles of inertial sensors and systems for undergraduate and postgraduate students of aerospace engineering, the topics dealt with will also be of benefit to practising engineers and can assist the researchers to locate excellent references for research work.

The authors have had three decades of design and application research experience in premier research institutions and have made use of their experience in giving a user-friendly shape to the book.


Latest Print 2013 / 416 pp. / 17.8 × 23.5 cm ISBN-978-81-203-3353-6 / ₹ 450.00

KURIAKOSE

Circuit Theory: Continuous and Discrete-time Systems, Elements of Network Synthesis

C.P. KURIAKOSE, is Consultant to the OEN Group of Companies, Director of Guardian Controls Ltd., Cochin and a Visiting Professor of Electrical Engineering, Govt. Model Engineering College, Cochin.

This book is designed to meet a felt need for a concise but systematic and rigorous presentation of Circuit Theory which forms the core of electrical engineering. The book is presented in four parts: Fundamental concepts in electrical engineering, Linear-time invariant systems, Advanced topics in network analysis, and Elements of network synthesis. A variety of illustrative examples, solved problems and exercises carefully guide the student from basic of electricity to the heart of circuit theory, which is supported by the mathematical tools of transforms. The inclusion of a chapter on PSpice and MATLAB is sure to whet the interest of the reader for further exploration of the subject—especially the advanced topics.

Intended primarily as a textbook for the undergraduate students of electrical, electronics, and computer science engineering, this book would also be useful for postgraduate students and professionals for reference and revision of fundamentals. The book should also serve as a source book for candidates preparing for examinations conducted by professional bodies like IE, IETE, IEEE.

KEY FEATURES

• Extensive use of Laplace transform and Fourier transform methods
• Topological interpretation of network laws
• Systematic classification of network theorems
• A number of useful tables such as Laplace transforms and inverse transforms.
• Topics on state variables, digital circuits and z-transforms, and non-linear systems for design engineers.
• Detailed treatment of filters.
• Chapter on Network Synthesis should serve as introductory material for Design Engineers and postgraduates.


Late Print 2009 / 528 pp. / 17.8 × 23.5 cm
ISBN-978-81-203-2643-9 / ₹ 350.00 / (e-book also available)

Communication Software

PALLAPA VENKATARAM, Professor in Department of Electrical Communication Engineering, Indian Institute of Science (IISc), Bangalore.
SUNILKUMAR S. MANVI, Professor and Head, Department of Electronics and Communication Engineering, Reva Institute of Technology and Management, Bangalore.
B. SATHISH BABU, Professor and Head, Department of Computer Science and Engineering, Siddaganga Institute of Technology, Tumkur.

This well accepted book, now in its second edition, is a time-honoured revision and extension of the previous edition. With improved organization and enriched contents, the book primarily focuses on the concepts of design development of communication protocols or communication software. Beginning with an overview of protocol engineering, the text analyzes important topics such as
• TCP/IP suite protocol structure.
• Protocol specification.
• Protocol specification languages like SDL, SPIN, Estelle, E-LOTOS, CPN, UML, etc.
• Protocol verification and validation techniques like semantic models and reachability analysis.
• Generating conformance test suite and its application to a running protocol implementation.

Communication Protocol Engineering is purely a text dedicated to the undergraduate students of electronics.
and communication engineering and computer engineering. The text is also of immense use to the postgraduate students of communication systems.

**Highlights of Second Edition**

- Incorporates latest and up-to-date information on the topics covered.
- Includes a large number of figures and examples for easy understanding of concepts.
- Presents some new sections like wireless protocol challenges, TCP protocol, verification of TCP, test execution, test case derivation, etc.
- Involves extension of protocol specification languages like SPIN, Estelle, UPPAAL etc.

**Contents:**

- Preface
- Introduction
- Modulation and Demodulation
- Radio Communication
- Telecommunication
- Radar
- Television
- Network Management in Communication
- Advanced Communication Systems
- Appendix
- Index

DISTINGUISHING FEATURES

- A number of solved examples that illustrate the application of theory to reinforce the concepts
- Concepts are explained with block diagrams that highlight the most significant points for better understanding
- Numerous objective type questions (around 400) are provided in the Appendix

The book is primarily addressed to the needs of the undergraduate students of electrical and electronics, electronics and communication engineering, and telecommunication engineering.

**Communication Systems**

M.N. BANDYOPADHYAY, Former Director, National Institute of Technology (NIT) Calicut. Earlier he was Director of NIT Kurukshetra.

This compact and student-friendly text offers a comprehensive introduction to several topics of communication engineering, imparting a thorough grounding in the fundamental concepts of modulation and demodulation, radio transmitters and receivers, telephone communication systems, radar, television, network management in data communication, and some advanced communication systems such as cellular radio, satellite networking and so on. It explains the basic theory of operation and applications. The main objective is to provide the students with a clear understanding of the principles of communication engineering, aided by several diagrams and solved numerical problems.

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**Computer Architecture/Computer Organization**

PAL CHAUDHURI

**Computer Organization and Design, 3rd ed.**

P. PAL CHAUDHURI, Professor Emeritus at Cellular Automata Research Lab (CARL), a research lab established by Alumnus Software, Salt Lake, Kolkata.

The merging of computer and communication technologies with consumer electronics has opened up new vistas for a wide variety of designs of computing systems for diverse application areas. This revised and updated third edition on Computer Organization and Design strives to make the students keep pace with the changes, both in technology and pedagogy in the fast growing discipline of computer science and engineering. The basic principles of how the intended behaviour of complex functions can be realized with the interconnected network of digital blocks are explained in an easy-to-understand style.

**WHAT IS NEW TO THIS EDITION**

- Includes a new chapter on Computer Networking, Internet, and Wireless Networks.
- Introduces topics such as wireless input-output devices, RAID technology built around disk arrays, USB, SCSI, etc.

**KEY FEATURES**

- Provides a large number of design problems and their solutions in each chapter.
- Presents state-of-the-art memory technology which includes EEPROM and Flash Memory apart from Main Storage, Cache, Virtual Memory, Associative Memory, Magnetic Bubble, and Charged Couple Device.
- Shows how the basic data types and data structures are supported in hardware.

Besides students, practising engineers should find reading this design-oriented text both useful and rewarding.

**Contents:**

- Preface
- Preface to the First Edition
- Acknowledgements
- Evolution of Computer Systems
- Computer System Design: Hierarchical Levels
- Information Representation
- Central Processing Unit (CPU)
- Controller Design
- Memory Subsystem
- Secondary Storage
- Input-Output Devices
- Input-Output Processing
- Computer System Architecture
- Computer Networking
- Internet
- Wireless Networks
- Bibliography
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- Internet
- Wireless Networks
- Bibliography
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RAJARAMAN & RADHAKRISHNAN  
Computer Organization and Architecture  
V. RAJARAMAN, Honorary Professor, Supercomputer Education and Research Centre, Indian Institute of Science, Bangalore.  
T. RADHAKRISHNAN, Professor of Computer Science and Software Engineering, Faculty of Engineering at Concordia University, Montreal, Canada.  

Designed as an introductory text for the students of computer science, computer applications, electronics engineering and information technology for their first course on the organization and architecture of computers, this accessible, student friendly text gives a clear and in-depth analysis of the basic principles underlying the subject.  

This self-contained text devotes one full chapter to the basics of digital logic. While the initial chapters describe in detail about computer organization, including CPU design, ALU design, memory design and I/O organization, the text also deals with Assembly Language Programming for Pentium using NASM assembler.  

What distinguishes the text is the special attention it pays to Cache and Virtual Memory organization, as well as to RISC architecture and the intricacies of pipelining. All these discussions are climaxed by an illuminating discussion on parallel computers which shows how processors are interconnected to create a variety of parallel computers.  

KEY FEATURES  
• Self-contained presentation starting with data representation and ending with advanced parallel computer architecture.  
• Systematic and logical organization of topics.  
• Large number of worked-out examples and exercises.  
• Contains basics of assembly language programming.  
• Each chapter has learning objectives and a detailed summary to help students to quickly revise the material.  


Latest Print 2014 / 508 pp. / 17.8 × 23.5 cm  
ISBN-978-81-203-3200-3 / ₹ 350.00 / (e-book also available)  

RAJARAMAN & RADHAKRISHNAN  
Digital Logic and Computer Organization  
V. RAJARAMAN, Honorary Professor, Supercomputer Education and Research Centre, Indian Institute of Science, Bangalore.  
T. RADHAKRISHNAN, Professor of Computer Science and Software Engineering in the Faculty of Engineering, Concordia University in Montreal.  

This introductory text on ‘digital logic and computer organization’ presents a logical treatment of all the fundamental concepts necessary to understand the organization and design of a computer. It is designed to cover the requirements of a first-course in computer organization for undergraduate Computer Science, Electronics, or MCA students. Beginning from first principles, the text guides students through to a stage where they are able to design and build a small computer with available IC chips.  

Starting with the foundation material on data representation, computer arithmetic and combinatorial and sequential circuit design, the text explains ALU design and includes a discussion on an ALU IC chip. It also discusses Algorithmic State Machine and its representation using a Hardware Description Language before shifting to computer organization.  

The evolutionary development of a small hypothetical computer is described illustrating hardware-software trade-off in computer organization. Its instruction set is designed giving reasons why each new instruction is introduced. This is followed by a description of the general features of a CPU, organization of main memory and I/O systems. The book concludes with a chapter describing the features of a real computer, namely the Intel Pentium. An appendix describes a number of laboratory experiments which can be put together by students, culminating in the design of a toy computer.  

KEY FEATURES  
• Self-contained presentation of digital logic and computer organization with minimal pre-requisites  
• Large number of examples provided throughout the book  
• Each chapter begins with learning goals and ends with a summary to aid self-study by students.  


Latest Print 2011 / 528 pp. / 17.8 × 23.5 cm  
ISBN-978-81-203-2979-9 / ₹ 295.00 / (e-book also available)
RAJARAMAN & RADHAKRISHNAN


V. RAJARAMAN, Honorary Professor, Supercomputer Education and Research Centre, Indian Institute of Science, Bangalore.
T. RADHAKRISHNAN, Professor of Computer Science and Software Engineering, Faculty of Engineering at Concordia University, Montreal, Canada.

This well-received book, now in fifth edition, has been thoroughly revised and updated, with new material on CMOS gates, MSI/ALU and Pentium5 architecture. The chapter on Cache and Virtual Memory has been re-written. A new chapter on Parallel Computers has been added.

The first part of the book is devoted to digital techniques used in the design of digital circuits and small digital systems. The second part deals with logical organization and architecture of computers. It also describes a small hypothetical computer to illustrate how instruction sets are evolved. Real computers (namely, Pentium and MIPS machines) are described and compared with the hypothetical computer. The remainder of this part describes I/O devices, cache and virtual memory and parallel computers.

The book does not assume extensive knowledge of electronics or mathematics. A knowledge of programming in C or Java would be useful to give the student a proper perspective to appreciate the development of the subject. This textbook is suitable for B.Sc. (Electronics) and B.Tech. courses. Both the parts of the book are self-contained and may be used independently, if appropriate.


Latest Print 2015 / 528 pp. / 17.8 × 23.5 cm
ISBN-978-81-203-3409-0 / ₹ 395.00 / (e-book also available)

RAO

Computer System Architecture

P.V.S. RAO, Formerly, Senior Professor and Head of the Computer Systems and Communications Group, Tata Institute of Fundamental Research (TIFR), Mumbai, is currently Adviser to Satyam Global Lifenet, Hyderabad.

Intended as a text for undergraduate and post-graduate students of engineering in Computer Science and Engineering, Information Technology, and students pursuing courses in computer applications (BCA/MCA) and computer science (B.Sc./M.Sc.), this state-of-the-art study acquaints the students with concepts and implementations in computer architectures. Though a new title, it is a completely reorganized, thoroughly revised and fully updated version of the author’s earlier book Perspectives in Computer Architecture.

The text begins with a brief account of the very early history of computers and describes the von Neumann IAS type of computers; then it goes on to give a brief introduction to the subsequent advances in computer systems covering device technologies, operational aspects, system organization and applications. This is followed by an analysis of the advances and innovations that have taken place in these areas. Advanced concepts such as look-ahead, pipelining, RISC architectures, and multi-programming are fully analyzed. The text concludes with a discussion on such topical subjects as computer networks, microprocessors and microcomputers, microprocessor families, Intel Pentium series, and newer high-power processors.

HALLMARKS OF THE BOOK

• The text fully reflects Professor P.V.S. Rao’s long experience as an eminent academic and his professional experience as an adviser to leading telecommunications/software companies.
• Gives a systematic account of the evolution of computers
• Provides a large number of exercises to drill the students in self-study.
• The five Appendices at the end of the text, cover the basic concepts to enable the students to have a better understanding of the subject.

Besides students, practising engineers should also find this book to be of immense value to them.


Latest Print 2011 / 520 pp. / 17.8 × 23.5 cm
ISBN-978-81-203-3594-3 / ₹ 325.00
Control Theory

ANAND KUMAR

Control Systems, 2nd ed.
A. ANAND KUMAR, Principal, K.L. University College of Engineering, K.L. University, Vijayawada, Andhra Pradesh.

This comprehensive text on control systems is designed for undergraduate students pursuing courses in electronics and communication engineering, electrical and electronics engineering, telecommunication engineering, electronics and instrumentation engineering, mechanical engineering, and biomedical engineering. Appropriate for self-study, the book will also be useful for AMIE and IETE students.

Written in a student-friendly readable manner, the book, now in its Second Edition, explains the basic fundamentals and concepts of control systems in a clearly understandable form. It is a balanced survey of theory aimed to provide the students with an in-depth insight into system behaviour and control of continuous-time control systems. All the solved and unsolved problems in this book are classroom tested, designed to illustrate the topics in a clear and thorough way.

NEW TO THIS EDITION
• One new chapter on Digital control systems
• Complete answers with figures
• Root locus plots and Nyquist plots redrawn as per MATLAB output
• MATLAB programs at the end of each chapter
• Glossary at the end of chapters

KEY FEATURES
• Includes several fully worked-out examples to help students master the concepts involved.
• Provides short questions with answers at the end of each chapter to help students prepare for exams confidently.
• Offers fill in the blanks and objective type questions with answers at the end of each chapter to quiz students on key learning points.
• Gives chapter-end review questions and problems to assist students in reinforcing their knowledge.


Latest Print 2014 / 892 pp. / 17.8 × 23.5 cm
ISBN-978-81-203-4939-1 / ₹ 495.00 / (e-book also available)

BANDYOPADHYAY

Control Engineering: Theory and Practice
M.N. BANDYOPADHYAY, Former Director, National Institute of Technology (NIT) Calicut. Earlier he was Director of NIT Kurukshetra.

This textbook offers a comprehensive analysis of the concepts of classical and modern control engineering for electrical and electronics engineering students. It is written in a manner that makes control theory exciting and accessible to students. It is well written, easy to follow and contains many practical applications, typical solved problems and objective-type questions so that the students can get a solid grounding in the subject matter.


Latest Print 2013 / 652 pp. / 17.8 × 23.5 cm

DESAI

Control System Components
M.D. DESAI, Professor in Instrumentation and Control Engineering, Institute of Technology, Nirma University, Ahmedabad.

This book is specially designed for undergraduate and postgraduate students in electrical engineering for a course in control system components.

The subject of control system components is interdisciplinary, covering electrical, mechanical, electronic, hydraulic and pneumatic components. This book provides student-friendly coverage of numerous control system components such as cams, gears, gyroscopes, potentiometers, synchros dc and ac servomotors, stepper motors, tachometers, rotating amplifiers, magnetic amplifiers, servo amplifiers, modulators and demodulators, relays, hydraulic system components, and pneumatic control valves etc. The clear writing style of the book, enhanced by illustrative figures, makes it an ideal text for gaining an in-depth understanding of the subject of control system components.

KEY FEATURES
• Concise and clear presentation of concepts
• Descriptions of different concepts and processes are illustrated with more than 350 neatly drawn figures
GHOSH
Introduction to Control Systems, 2nd ed.
ARUN K. GHOSH, Visiting Professor, Sir J.C. Bose School of Engineering, Hooghly.

The Second Edition to this text, which is largely revised and updated version of *Introduction to Linear and Digital Control Systems* by the same author, continues to build on the fundamental concepts covered earlier. The text discusses the important concepts of control systems, transfer functions and system components. It describes system stability, employing the Hurwitz–Routh stability criterion, root locus technique, Bode plot and polar and Nyquist plots. In addition, this student-friendly book features in-depth coverage of controllers, compensators, state-space modelling, and discrete time systems.

The book is designed for undergraduate courses in control systems for electrical engineering, electronics and instrumentation, and computer science and engineering courses.

**NEW TO THIS EDITION**
- New chapter on Relevant Mathematics.
- Incorporates many more worked-out examples mostly related from the GATE exams on Instrumentation Engineering over the last several years.
- Text refined, wherever felt necessary, to make it more student friendly.


Latest Print 2013 / 764 pp. / 17.8 × 23.5 cm

KRISHNA KANT
Computer-Based Industrial Control, 2nd ed.
KRISHNA KANT, Dean (Academic) at Jaypee Institute of Information Technology, Noida.

This book, now in its **second edition**, presents in a comprehensive manner the fundamentals of computer-based control of industrial processes. Intended primarily for undergraduate and postgraduate students of instrumentation/electronics engineering, the book will also be immensely useful for professionals and researchers in these fields.

The book begins with a thorough introduction to automation—its history, utility and the current scenario. It then moves on to discuss in detail the techniques, components, subsystems and system architectures relevant to process control. The control techniques covered include classical controls as well as newer controls such as model-based adaptive control, self-tuning control, expert systems and fuzzy logic control. The components consist of sensors and actuators of various types. The subsystems covered are SCADA systems, remote terminal units for telemetry and telecontrol, programmable controllers, distributed digital controllers and personal computers. Also included are real-time operating systems and real-time programming languages. The major architectures discussed are distributed digital control, distributed SCADA system and multi-microprocessor architectures. The book thoroughly covers the various technological developments in this field. It also covers, through a number of case studies, the applications of computer-based control in major industries.

The second edition contains substantially revised and updated content on a large number of topics covered in the first edition.


Latest Print 2015 / 616 pp. / 17.8 × 23.5 cm
ISBN-978-81-203-3988-0 / ₹ 395.00 / (e-book also available)

KUO
Automatic Control Systems, 7th ed.
BENJAMIN C. KUO, Professor Emeritus, Department of Electrical and Computer Engineering, University of Illinois at Urbana-Champaign.

This best-selling, classic introduction to automatic control systems has been updated to reflect the increasing use of...
This book is suitable for students of control engineering, control system designers and researchers.


Latest Print 2008 / 336 pp. / 15.3 × 22.9 cm

ROY CHOUDHURY
Modern Control Engineering
D. ROY CHOUDHURY is Professor and Head, Computer Engineering Department, Delhi College of Engineering, Delhi.

This book represents an attempt to organize and unify the diverse methods of analysis of feedback control systems and presents the fundamentals explicitly and clearly. The scope of the text is such that it can be used for a two-semester course in control systems at the level of undergraduate students in any of the various branches of engineering (electrical, aeronautical, mechanical, and chemical).

Emphasis is on the development of basic theory. The text is easy to follow and contains many examples to reinforce the understanding of the theory. Several software programs have been developed in MATLAB platform for better understanding of design of control systems. Many varied problems are included at the end of each chapter.

The basic principles and fundamental concepts of feedback control systems, using the conventional frequency domain and time-domain approaches, are presented in a clearly accessible form in the first portion (Chapters 1 through 10). The later portion (Chapters 11 through 14) provides a thorough understanding of concepts such as state space, controllability, and observability. Students are also acquainted with the techniques available for analysing discrete-data and nonlinear systems.

The hallmark feature of this text is that it helps the reader gain a sound understanding of both modern and classical topics in control engineering.


SARKAR
Advanced Control Systems
B.N. SARKAR, Professor in the Department of Electrical and Electronics Engineering at Dayananda Sagar College of Engineering, Bangalore.

Designed as a textbook for undergraduate students pursuing courses in Electrical Engineering, Electrical and Electronics Engineering, Instrumentation and Control Engineering, and Electronics and Communication Engineering, this book explains the fundamental concepts and design principles of advanced control systems in a understandable manner.

The book deals with the various types of state space modelling, characteristic equations, eigenvalues and eigenvectors including the design of the linear systems applying the pole placement technique. It provides step-by-step solutions to state equations and discusses the stability analysis and design of non-linear control systems applying the phase plane technique, Routh’s criteria, Bode plot, Nyquist plot, Lyapunov’s and function methods. Furthermore, it also introduces the sampled-data control systems explaining the z-transforms and inverse z-transforms.

The text is supported with a large number of illustrative examples and review questions to reinforce the students’ understanding of the subject matter.


Latest Print 2013 / 376 pp. / 17.8 × 23.5 cm
ISBN-978-81-203-4710-6 / ₹ 450.00 / (e-book also available)

SINGH
Process Control: Concepts, Dynamics and Applications
S.K. SINGH, Head, Maintenance Services Group (Electrical) and Telecommunication, Tata Steel Limited, Jamshedpur.

Process control, a sub-discipline of automatic control, involves tailoring methods for the efficient operation of industrial processes. Proper application of process control improves the safety and profitability of a process, while maintaining consistently high product quality.

This book is a comprehensive introduction to the vast and important field of control systems. The text introduces the theory of automatic control and its applications to the chemical process industries with emphasis on topics that are of use to the process control engineers and specialists. It also covers the advanced control strategies and its practical implementation with an excellent balance of theoretical concepts and engineering practice.

KEY FEATURES
- Extensive coverage of topics such as Feedback control, Modelling, Controller design, and response analysis and stability criterion per evaluating robustness of control systems.
- Large number of illustrative figures and solved examples at the end of the chapters.
- Extensive set of review questions and self-check quizzes with answers at the end of each chapter.
- Case studies for bridging the gap between theoretical learning and practical implementation.

Designed to serve as a textbook for both undergraduate and postgraduate students of chemical engineering, this book will also be useful for mechanical, instrumentation and electrical engineers who help design process control systems.


Latest Print 2008 / 748 pp. / 17.8 × 23.5 cm
ISBN-978-81-203-3678-0 / ₹ 450.00 / (e-book also available)

Digital Communication
NIIT
Advanced Digital Communication Systems

This comprehensive text narrates the advancement of Digital Communication Systems with the advent of various communication techniques. It explains the technology involved in digital systems by analyzing the various theories, methodologies and protocols.

The book gives an in depth analysis of advanced digital communication systems and in so doing it focusses on topics such as:
- Basics of digital communication systems with explanation on the performance of digital pulse modulation techniques in noise, etc.
• Need for synchronization and basic synchronization techniques.
• Spread spectrum techniques and their performance along with the generation and properties of spread spectrum codes in the field of digital communication.
• Study of cryptography and popular cipher systems.
• Elements of satellite communication system and its design.

Contents:

Digital Electronics and Logic Design
ANAND KUMAR
A. ANAND KUMAR, Principal, K.L. University College of Engineering, K.L. University, Vijayawada, Andhra Pradesh.

The third edition of this well-received text continues to provide coherent and comprehensive coverage of digital circuits. Now, based on the readers’ demand, this new edition incorporates VHDL programs at the end of each chapter. It is designed for the undergraduate students pursuing courses in areas of engineering disciplines such as Electrical and Electronics, Electronics and Communication, Electronics and Instrumentation, Telecommunications, Medical Electronics, Computer Science and Engineering, Electronics, and Computers and Information Technology. It is also useful as a text for MCA, M.Sc. (Electronics) and M.Sc. (Computer Science) students. Appropriate for self study, the book is useful even for AMIE and grad IETE students.

Written in a student-friendly style, the book provides an excellent introduction to digital concepts and basic design techniques of digital circuits. It discusses Boolean algebra concepts and their application to digital circuitry, and elaborates on both combinational and sequential circuits. It provides numerous fully worked-out, laboratory tested examples to give students a solid grounding in the related design concepts. It includes a number of short questions with answers, review questions, fill in the blanks with answers, multiple choice questions with answers and exercise problems at the end of each chapter.

As the book requires only an elementary knowledge of electronics to understand most of the topics, it can also serve as a textbook for the students of polytechnics, B.Sc. (Electronics) and B.Sc. (Computer Science).


Pulse and Digital Circuits, 2nd ed.
A. ANAND KUMAR, Principal, K.L. University College of Engineering, K.L. University, Vijayawada, Andhra Pradesh.

The second edition of this well-received text continues to provide a coherent and comprehensive coverage of Pulse and Digital Circuits, suitable as a textbook for use by
undergraduate students pursuing courses in Electrical and Electronics Engineering, Electronics and Communication Engineering, Electronics and Instrumentation Engineering, and Telecommunication Engineering. It presents clear explanations of the operation and analysis of semiconductor pulse circuits. Practical pulse circuit design methods are investigated in detail.

The book provides numerous fully worked-out, laboratory-tested examples to give students a solid grounding in the related design concepts. It includes a number of classroom-tested problems to encourage students to apply theory in a logical fashion. Review questions, fill in the blanks, and multiple choice questions offer the students the opportunity to test their understanding of the text material.

This text will be also appropriate for self-study by AMIE and IETE students.

**NEW TO THIS EDITION**

- Includes two new chapters—Logic Gates and Logic Families—to meet the curriculum requirements.
- Provides short questions with answers at the end of each chapter.
- Presents several new illustrations, examples and exercises.


Latest Print 2014 / 844 pp. / 17.8 x 23.5 cm
ISBN-978-81-203-4938-4 / ₹ 495.00 / (e-book also available)

ANANDA NATARAJAN

**Digital Design**

R. ANANDA NATARAJAN, Professor and Head, Department of Electronics and Instrumentation Engineering, Pondicherry Engineering College, Puducherry. He is a fellow of Institution of Engineers (India) and member of Instrumentation Systems Automation (ISA) Society, USA.

Primarily intended for undergraduate engineering students of Electronics and Communication, Electronics and Electrical, Electronics and Instrumentation, Computer Science and Information Technology, this book will also be useful for the students of BCA, B.Sc. (Electronics and CS), M.Sc. (Electronics and CS) and MCA.

*Digital Design* is a student-friendly textbook for learning digital electronic fundamentals and digital circuit design. It is suitable for both traditional design of digital circuits and HDL based digital design. This well organised text gives a comprehensive view of Boolean logic, logic gates and combinational circuits, synchronous and asynchronous circuits, memory devices, semiconductor devices and PLDs, and HDL, VHDL and Verilog programming. Numerous solved examples are given right after conceptual discussion to provide better comprehension of the subject matter. VHDL programs along with simulation results are given for better understanding of VHDL programming.

**KEY FEATURES**

- Well labelled illustrations provide practical understanding of the concepts.
- GATE level MCQs with answers (along with detailed explanation wherever required) at the end of each chapter help students to prepare for competitive examinations.
• Short questions with answers and appropriate number of review questions at the end of each chapter are useful for the students to prepare for university exams and competitive exams.

• Separate chapters on VHDL and Verilog programming along with simulated results are included to enhance the programming skills of HDL.


Latest Print 2015 / 780 pp. / 17.8 × 23.5 cm ISBN-978-81-203-4977-3 / ₹ 595.00 / (e-book also available)
Digital Image Processing
CHANDA & MAJUMDER
Digital Image Processing and Analysis, 2nd ed.
BHABATOSH CHANDA, Professor, Electronics and Communication Sciences Unit, Indian Statistical Institute, Kolkata.
DWIJESH DUTTA MAJUMDER, Professor Emeritus, Electronics and Communication Sciences Unit, Indian Statistical Institute, Kolkata.

The second edition of this extensively revised and updated text is a result of the positive feedback and constructive suggestions received from academics and students alike. It discusses the fundamentals as well as the advances in digital image processing and analysis—both theory and practice—to fulfill the needs of students pursuing courses in Computer Science and Engineering (CSE) and Electronics and Communication Engineering (ECE), both at undergraduate and postgraduate levels. It is also considered useful for teachers, professional engineers and researchers.

The second edition has three objectives. First, each and every chapter has been modified in the light of recent advances as well as emerging concepts. Second, a good deal of colour image processing has been incorporated. A large number of line drawings and images have been included to make the book student friendly. Third, some new problems have been added in almost all chapters to test the student’s understanding of the real-life problems.

The other distinguishing features of the book are:
• A summary at the end of the chapter to help the student capture the key points.
• About 320 line drawings and 280 photographs for easy assimilation of the concepts.
• Chapter-end problems for extensive practice and research.


Applications of image processing in the areas of biometrics, speaker recognition, satellite imaging, medical imaging, and many more.

The style of presentation is comprehensive and application oriented, comprising examples, diagrams, image results, case studies of applications, and review questions—making it easy for students to understand key ideas, their practical relevance and applications.


Digital Image Processing: An Algorithmic Approach
MAHURU JOSHI, Professor of Electronics at the College of Engineering, Pune.

This introduction to the fundamental concepts and methodologies of image processing is suitable for first-year postgraduate and senior undergraduate students in almost any engineering discipline, and in particular meets the requirement of the prescribed courses in the following streams:
• Electronics and Communication
• Computer Science and Engineering
• Information and Communication Technology

The book offers a balanced exposition of basic principles and applications of image processing. It lays considerable emphasis on the algorithmic approach in order to teach students how to write good practical programs for problem solving.

MAJOR TOPICS COVERED INCLUDE
• Image fundamentals
• Different image transforms
• Image enhancement in the spatial and frequency domains
• Restoration
• Image analysis
• Image description
• Image compression, and
• Image reconstruction from projections

Applications of image processing in the areas of biometrics, speaker recognition, satellite imaging, medical imaging, and many more.

The style of presentation is comprehensive and application oriented, comprising examples, diagrams, image results, case studies of applications, and review questions—making it easy for students to understand key ideas, their practical relevance and applications.


Lab Primer through MATLAB®: Digital Signal Processing, Digital Image Processing, Digital Signal Processor and Digital Communication
K.A. NAVAS, Principal, LBS College of Engineering, Kerala.
R. JAYADEVAN, Assistant Professor, Department of Electronics and Communication Engineering, Sreepahy Institute of Management and Technology, Kerala.

This systematically designed laboratory manual elucidates a number of techniques which help the students carry out various experiments in the field of digital signal processing, digital image processing, digital signal
Digital Signal Processing

MALAY K. PAKHIRA, Associate Professor in the Department of Computer Science and Engineering, Kalyani Government Engineering College, Kalyani, West Bengal.

This book is designed for undergraduate and postgraduate students of Computer Science and Engineering, Information Technology, Electronics and Communication Engineering, and Electrical Engineering.

The book comprehensively covers all the important topics in digital signal processing and pattern recognition along with the fundamental concepts, mathematical preliminaries and theoretical derivations of significant theorems. The image processing topics include coverage of image formation, digitization, lower level processing, image analysis, image compression, and so on. The topics on pattern recognition include statistical decision making, decision tree learning, artificial neural networks, clustering and others. An application of simulated annealing for edge detection is described in an appendix. The book is profusely illustrated with more than 200 figures and sketches as an added feature.

KEY FEATURES

- Provides a large number of worked examples to strengthen the grasp of the concepts.
- Lays considerable emphasis on the algorithms in order to teach students how to write good practical programs for problem solving.
- Devotes a separate chapter to currently used image format standards.
- Offers problems at the end of each chapter to help students test their understanding of the fundamentals of the subject.


Latest Print 2013 / 528 pp. / 17.8 × 23.5 cm
ISBN-978-81-203-4091-6 / ₹ 425.00 / (e-book also available)
processing and introduction to digital signal processors and finite word length effects on digital filters are also covered. All the solved and unsolved problems in this book are designed to illustrate the topics in a clear way. MATLAB programs and the results for typical examples are also included at the end of chapters for the benefit of the students.

**NEW TO THIS EDITION**

- A chapter on Finite Word Length Effects in Digital Filters

**KEY FEATURES**

- Numerous worked-out examples in each chapter
- Short questions with answers help students to prepare for examinations and interviews
- Fill in the blanks, review questions, objective type questions and unsolved problems at the end of each chapter to test the level of understanding of the subject

**Contents:**


Latest Print 2015 / 984 pp. / 17.8 × 23.5 cm

ISBN-978-81-203-5071-7 / ₹ 550.00 / (e-book also available)

**NAIR**

Digital Signal Processing: Theory, Analysis and Digital-filter Design

B. SOMANATHAN NAIR, Principal, Pankaja Kashturi College of Engineering and Technology, Thiruvananthapuram (Kerala) and Visiting Professor, Department of Optroelectronics, University of Kerala.

This textbook for a one-semester course in Digital Signal Processing and Filter Design is suitable for undergraduate students of Electrical and Electronics Engineering, Electronics and Instrumentation Engineering, Instrumentation and Control Engineering, Electronics and Communication Engineering, Computer Science and Engineering, and Information Technology. Besides, it will also be a useful text for students pursuing applied sciences degree courses in Electronics, Computer Science, Computer Applications, and Information Technology.

Though DSP is often treated as a complicated theoretical subject, this book through several worked examples strives to provide a motivating introduction to fundamental concepts, principles and applications of DSP. Building on the basic theory of DSP, the transformations techniques of signals such as Discrete-Time Fourier Transform (DTFT), Discrete Fourier Transform (DFT), Fast-Fourier Transform (FFT), and z-transform are discussed in detail.

Several chapters are devoted to design and practical implementation schemes of analog and digital filters. The design of IIR filters using the Butterworth, Chebyshev, and Inverse Chebyshev approximations is illustrated. The design of FIR filters based on the Fourier-series and frequency-sampling methods, is discussed.

Owing to their importance in DSP, the differential and difference equations are discussed in the penultimate chapter. The final chapter describes some of the practical applications of DSP.

**Contents:**


Latest Print 2013 / 488 pp. / 17.8 × 23.5 cm

ISBN-978-81-203-2595-1 / ₹ 325.00 / (e-book also available)

**NAVAS & JAYADEVAN**

Lab Primer through MATLAB®: Digital Signal Processing, Digital Image Processing, Digital Signal Processor and Digital Communication

K.A. NAVAS, Principal, LBS College of Engineering, Kerala. R. JAYADEVAN, Assistant Professor, Department of Electronics and Communication Engineering, Sreepathy Institute of Management and Technology, Kerala.

This systematically designed laboratory manual elucidates a number of techniques which help the students carry out various experiments in the field of digital signal processing, digital image processing, digital signal processor and digital communication through MATLAB® in a single volume. A step-wise discussion of the programming procedure using MATLAB® has been carried out in this book. The numerous programming examples for each digital signal processing lab, image processing lab, signal processor lab and digital communication lab have also been included.

The book begins with an introductory chapter on MATLAB®, which will be very useful for a beginner. The concepts are explained with the aid of screenshots. Then it moves on to discuss the fundamental aspects in digital signal processing through MATLAB®, with a special
emphasis given to the design of digital filters (FIR and IIR). Finally digital communication and image processing sections in the book help readers to understand the commonly used MATLAB® functions. At the end of this book, some basic experiments using DSP trainer khit have also been included.

This book is intended for the undergraduate students of electronics and communication engineering, electronics and instrumentation engineering, and instrumentation and control engineering for their laboratory courses in digital signal processing, image processing and digital communication.

KEY FEATURES
- Includes about 115 different experiments.
- Contains several figures to reinforce the understanding of the techniques discussed.
- Gives systematic way of doing experiments such as Aim, Theory, Programs, Sample inputs and outputs, Viva voce questions and Examination questions


Latest Print 2014 / 356 pp. / 17.8 × 23.5 cm
ISBN-978-81-203-4932-2 / ₹ 350.00 / (e-book also available)

UDAYASHANKARA
Modern Digital Signal Processing Includes Signals and Systems—MATLAB Programs, DSP Architecture with Assembly and C Programs, 2nd ed.

V. UDAYASHANKARA, Professor in the Department of Instrumentation Technology, Sri Jayachamarajendra College of Engineering (SJCE), Mysore.

Intended as a text for three courses—Signals and Systems, Digital Signal Processing (DSP), and DSP Architecture—this comprehensive book, now in its Second Edition, continues to provide a thorough understanding of digital signal processing, beginning from the fundamentals to the implementation of algorithms on a digital signal processor.

This Edition includes a new chapter on Continuous Time Signals and Systems, and many Assembly and C programs, which are useful to conduct a laboratory course in Digital Signal Processing. Besides, many existing chapters are modified substantially to widen the coverage of the book.

Primarily designed for undergraduate students of Electronics and Communication Engineering, Electronics and Instrumentation Engineering, Electrical and Electronics Engineering, Instrumentation and Control Engineering, Computer Science and Engineering, and Information Technology, this text will also be useful as a supplementary text for advanced digital signal processing and real time digital signal processing courses of Postgraduate programmes.

KEY FEATURES
- Provides a large number of worked-out examples to strengthen the grasp of the concepts of digital signal processing.
- Explains the architecture, addressing modes and instructions of TMS 320C54XX fixed point DSP with assembly language and C programs.
- Includes MATLAB programs and exercises throughout the book.
- Offers review questions and multiple choice questions at the end of each chapter to help students test their understanding about the fundamentals of the subject.
- Contains MATLAB commands in Appendix.


Latest Print 2012 / 824 pp. / 17.8 × 23.5 cm
ISBN-978-81-203-4567-6 / ₹ 495.00 / (e-book also available)

Electric Drives

DE & SEN

Electric Drives

NISIT K. DE, formerly Professor at IIT Kharagpur (1968–2007), is presently Visiting Professor, Department of Electrical Engineering, Narula Institute of Technology, Kolkata.

PRASANTA K. SEN, Professor, Department of Electrical Engineering, Regional Engineering College, Durgapur.

This book provides a comprehensive introduction to the fundamental concepts of electric drives and is eminently suited as a textbook for undergraduate, AMIE and courses in electrical engineering. It can also be used most effectively by all those preparing for GATE and UPSC competitive examinations, as well as by practising engineers. The topics, which range from principles and techniques to industrial applications, include characteristic features of drives, methods of braking and
speed control, electromagnetic and solid state control of motors, motor ratings, transients in drive systems, and operation of stepper motors.


Latest Print 2014 / 324 pp. / 17.8 × 23.5 cm
ISBN-978-81-203-3643-8 / ₹ 250.00

Deshpande
Electric Motors: Applications and Control
Late (Professor) M.V. Deshpande, former Professor and Head Department of Electrical Engineering, L.D. College of Engineering, Ahmadabad and College of Engineering, Pune.

This book provides a practical introduction to the various types of motors used in industrial drives. While selecting suitable motors for industrial applications, a good knowledge of the mechanical and electrical elements involved and a thorough understanding of the load and motor characteristics is essential. The book describes the load requirements of some typical drives, the type of motors used, their characteristics, duty cycles and specifications.

The starting, braking and speed control of dc motors, induction motors and synchronous motors are dealt with. The solid state speed control methods for dc and ac motors are discussed. The criteria for selection of motors for various industrial drives are explained in detail. Finally, electric energy conservation in the use of electric motors and drives is emphasized.

KEY FEATURES

- Provides balanced coverage of theory and practical applications of industrial motor drives and their problems.
- Includes numerous worked-out examples to demonstrate and establish the principles and their applications.
- Chapter-end problems include engineering applications of electric motors and electric drives.

This book is suitable for degree and diploma students of electrical engineering as well as for AMIE Part B students for courses in Electric Drives.


Latest Print 2010 / 228 pp. / 17.8 × 23.5 cm
ISBN-978-81-203-3643-8 / ₹ 225.00 / (e-book also available)

Sivanagaráju, et al.
Power Semiconductor Drives
S. Sivanagaráju, Associate Professor of Electrical Engineering, University College of Engineering, Jawaharlal Nehru Technological University, Kakinada.
M. Balasubba Reddy, Associate Professor, Department of Electrical and Electronics Engineering, Prakasam Engineering College, Prakasam.
A. Mallikarjuna Prasad, Associate Professor, Department of Electrical and Electronics Engineering, St. John’s College of Engineering and Technology, Kurnool.

This textbook introduces students to the underlying principles of operation of power semiconductor drives. It explains every facet of application of power electronics to the control of electric drives in industrial drives. The book is primarily intended for B.E./B.Tech. students of Electrical Engineering/Electrical and Electronics Engineering having courses in Electric Drives/Power Semiconductor Drives. It will also be highly useful for M.E./M.Tech. students of these disciplines specializing in Power Electronics/Industrial Drives/Electric Drives.

The text is divided into eight chapters. The first two chapters cover the control of dc motors by using various kinds of converters. The third chapter focuses on dual converters and various braking techniques. Chopper control fed dc motors are discussed in the fourth chapter. The next three chapters are devoted to control methods for induction motors. The eighth chapter deals with the control of synchronous motor drives fed from VSI converters and cycloconverters.

KEY FEATURES

- Extensive comparative analysis of various power semiconductor drives
- Detailed analysis of continuous and discontinuous current conduction modes of operation for semi- and fully-controlled rectifiers
- Comprehensive derivations of various relevant equations

Extensively illustrated, the book contains numerous solved examples throughout the text as well as a variety of chapter-end questions to help in comprehending as well as in strengthening the grasp of the underlying concepts and principles.


Latest Print 2013 / 392 pp. / 17.8 × 23.5 cm
ISBN-978-81-203-3658-2 / ₹ 295.00 / (e-book also available)
Electrical Engineering Drawing

YOGESH, et al.

Computer Aided Electrical Drawing

M. YOGESH, Assistant Professor, Department of Electrical and Electronics Engineering, Dayananda Sagar College of Engineering, Bangalore.
B.S. NAGARAJA, Assistant Professor, Department of Electrical and Electronics Engineering, Dayananda Sagar College of Engineering, Bangalore.
N. NANDAN, Assistant Professor, Department of Electrical and Electronics Engineering, Dayananda Sagar College of Engineering, Bangalore.

Intended as a text for the undergraduate students of electrical engineering, it emphasises on design concept and drawing electrical apparatus based on design approach.

To stay at par with the present day technology, AutoCAD® 2014 is used in this book to draw electrical apparatus. It gives a comprehensive view of winding diagrams of different machines, its types along with the assembling technique of various electrical machines and also the single line representations of the power system with various standard symbols. This book has been prepared to meet the needs of the students in a simpler manner. Every topic has been dealt carefully with necessary explanation and presentation of the material is lucid. This student-friendly text also covers those topics which are required by aspiring engineers in practical situations along with the present industrial requirements and standards.

KEY FEATURES

• Use of plenty of illustrations for explaining the concepts or the principles.
• Inclusion of practical problems with their solutions.
• Graded exercises and model questions at the end of each chapter.

Contents:


Electrical Engineering Materials

G.K. BANERJEE, Professor and Head, Department of Electrical Engineering, SET, IFTM University, Lodipur Rajput, Moradabad.

The book has been written in a lucid and systematic manner with necessary mathematical derivations, illustrations, examples and practise exercises providing a detailed description of the materials used in electrical and electronics engineering and their applications. Explaining the atomic structure of the materials, the book deals with the behaviour of dielectrics and their properties under the influence of DC and AC fields. It covers the magnetic properties of materials including soft and hard magnetic materials and their applications. The text discusses fabrication techniques and the basic physics involved in the operation of the semiconductors, junction transistors and rectifiers. It includes the detailed description of optical properties of materials, photovoltaic materials and the materials used in lasers and optical fibres. It also incorporates the latest information on the materials used for the direct energy conversion and fuel cell technologies.

This book is primarily intended for undergraduate students of electrical engineering and electrical and electronics engineering.

KEY FEATURES

• Contains sufficient numbers of solved numerical examples.
• Includes a set of review questions and a list of references at the end of each chapter.
• Provides a set of numerical problems in some of the chapters, wherever required.
• Contains more than 150 diagrammatic illustrations for easy understanding of the concepts.

Contents:


Electrical Machines

M.N. BANDYOPADHYAY, Former Director, National Institute of Technology (NIT) Calicut. Earlier he was Director of NIT Kurukshetra.

This comprehensive, up-to-date introduction to Electrical Machines is designed to meet the needs of undergraduate electrical engineering students. It presents the essential principles of rotating machines and transformers. The emphasis is on the performance, though the book also introduces the salient features of electrical machine design.

The book provides accessible, student-friendly coverage
of dc machines, transformers, three-phase induction motor, single-phase induction motor, fractional horsepower motors, and synchronous machines. The clear writing style of the book enhanced by illustrative figures and simplified explanations of the fundamentals, makes it an ideal text for gaining a thorough understanding of the subject of electrical machines.

KEY FEATURES INCLUDE:

- Detailed coverage of the construction of electrical machines.
- Lucid explanations of the principles of operation of electrical machines.
- Methods of testing of electrical machines.
- Performance calculations of electrical machines.
- Wealth of diverse solved examples in each chapter to illustrate the application of theory to practical problems.
- Salient features of design of electrical machines.
- Objective type questions to help students prepare for competitive exams.


DE & DUTTA

Electric Machines and Electric Drives: Problems with Solutions

NISIT K. DE, formerly Professor at IIT Kharagpur (1968–2007), is presently Visiting Professor, Department of Electrical Engineering, Narula Institute of Technology, Kolkata.

SWAPAN K. DUTTA, Professor, Department of Electrical Engineering, National Institute of Technology, Durgapur.

This problem-oriented book provides solutions to the common problems in two major areas of Electrical Engineering discipline such as electric machines and electric drives (with power electronics linking them) under a single cover. It serves as a supplement to textbooks on the subject.

The book includes as many as 163 well-graded solved problems, covering topics such as transformer, dc machine, ac machines, induction (motor) and synchronous types, special motors, power electronics and electric drives. The problems have been solved in a clear and step-by-step manner.

Each chapter discusses various formulas and other details such as circuit diagrams and relevant waveforms used to solve the problems.

The book contains 161 supplementary problems with answers for practice. Their complete solutions are also provided at the end of the book. The students can hone their skills and enhance their understanding of the subject matter by solving these supplementary problems.

The book is designed for the undergraduate students of electrical engineering. It will also be useful for those preparing for AMIE and competitive examinations.


DESHPANDE

Design and Testing of Electrical Machines

Late (Professor) M.V. DESHPANDE, former Professor and Head, Department of Electrical Engineering, L.D. College of Engineering, Ahmedabad and College of Engineering, Pune.

This textbook offers a practical approach to electrical machines, featuring clear-cut explanations of fundamental principles, and attention to industrial practices in design and testing of electrical machines. The basic theory, principle of operation and characteristics of transformers, three-phase induction motors, single-phase induction motors, synchronous machines and dc machines are dealt with in Appendices to provide the background for the design of these machines.

The initial chapters of the book are devoted to basic parameters of design of electrical apparatus, characteristics of magnetic, electric and insulating materials, construction of electrical machines, and basic design requirements of magnetic and electrical circuits of machines. Detailed procedures for designing transformers, three-phase induction motors, single-phase induction motors, synchronous machines and dc machines are explained in a simple and logical way. Several sample designs have been wroked out in detail. Methods of carrying out various tests and maintaining test records are discussed in detail.

The use of computers in designing electrical machines has been illustrated. An exclusive chapter on special machines explains the basic theory and applications of stepper motors, rotating phase converters, pole amplitude modulated (PAM) motors, reluctance motors and energy efficient motors.

This book is intended for degree and diploma students of electrical engineering and professional examinations of the Institution of Engineers (India). It will be useful for electrical engineers in industry engaged in design, manufacture and testing of electrical machines.

Contents: Preface. Acknowledgements. Principles of

Latest Print 2014 / 480 pp. / 17.8 × 23.5 cm
ISBN-978-81-203-4880-6 / ₹ 350.00 / (e-book also available)

JANARDANAN
Special Electrical Machines
E.G. JANARDANAN, Professor, Department of Electrical and Electronics Engineering, N.S.S. College of Engineering, Palakkad, Kerala.

This book covers the complete syllabi prescribed for undergraduate courses in electrical, electronics, mechanical and instrumentation engineering offered by various Indian universities.

The objective of this text is to provide thorough knowledge in the emerging field of special electrical machines. It discusses the stepper motor, switched reluctance motor, permanent magnet dc and ac motors, brushless dc motors, single phase special electric motors, servomotors, linear electric machines and permanent magnet axial flux machines.

KEY FEATURES
• Chapter on permanent magnet axial flux machines (not available in other Indian authors’ books)
• Numerous worked-out examples
• Based on classroom tested materials
• Simplified mathematical analysis

Besides undergraduate students, the book will also be useful to the postgraduate students specialising in drives and control, power electronics, control systems and mechatronics.


Latest Print 2014 / 280 pp. / 17.8 × 23.5 cm
ISBN-978-81-203-4880-6 / ₹ 250.00 / (e-book also available)

PRASAD
Electrical Machines
RAJENDRA PRASAD, former Professor and Head, Department of Electrical Engineering, National Institute of Technology (NIT), Patna. He is presently visiting faculty in NIT, Patna.

This comprehensive textbook covers the syllabus of electrical machines of almost all the Indian universities. The language of the book is simple and easy to understand and each topic is well illustrated by examples and figures. The book can be used by the students for self-teaching. It deals in electromagnetism and discusses...
the electromechanical energy conversion principles. The text explains the principles and working of transformers, synchronous machines and three-phase induction motors. The book also deals with other special types of machines including single phase induction motor.

This book is primarily intended for undergraduate students of electrical engineering.

KEY FEATURES

- Contains a large number of solved problems and review questions in each chapter.
- Supplements a large number of multiple choice questions and numerical problems with their answers in each chapter.
- Provides an elaborate and systematic analysis of working principle, application and construction of each electrical machine.


Latest Print 2015 / 464 pp. / 17.8 × 23.5 cm
ISBN-978-81-203-5042-7 / ₹ 425.00 / (e-book also available)

Electrical Power Systems

BANDYOPADHYAY

Electrical Power Systems: Theory and Practice

M.N. BANDYOPADHYAY, Former Director, National Institute of Technology (NIT) Calicut. Earlier he was Director of NIT Kurukshetra.

This book offers a comprehensive introduction to the subject of power systems, providing a systematic exposition of power generation, transmission, and distribution. The author has simplified the discussion of the core concepts, making the book student-friendly. Suitable for those pursuing engineering in electrical, mechanical, and industrial disciplines, the book will also be of immense interest to those working in the field of electrical power systems.

The book introduces the readers to the concept of ‘power systems’ and presents in detail the intricacies of hydroelectric, thermal, and nuclear power plants. Its area of emphasis, however, is power transmission and power distribution.

KEY FEATURES

- Comprehensive treatment of electrical power generation, transmission and distribution.
- Extensive treatment of switchgear and protection.
- Figures given to illustrate the concepts discussed at all appropriate places.
- Numerous analytical Solved Problems provided.

- Objective Type Questions provided to help the readers self-analyze their conceptual understanding.


BHIDE

Digital Power System Protection

S.R. BHIDE, Associate Professor of Electrical Engineering at the Visvesvaraya National Institute of Technology, Nagpur.

Digital power system protection, as a subject, offers the use of computers in power line relaying which is the act of automatically controlling the power system via instrumentation and control devices. This book is an attempt to make a gentle introduction to the nitty-gritty of digital relays. Written in a simple, clear and student-friendly style, this text covers basics of digital processing of analog signals for the purpose of relaying. All important basic algorithms that are used in various types of digital relays have been explained. FIR and IIR filters have been presented in such a manner that students will be able to develop intuitive understanding. The book also covers DFT and FFT and synchrophasor technology in details. MATLAB programs and Excel simulations have been given to reinforce the comprehension of the algorithms.

This book has been thoroughly class-room tested and based on course notes which is primarily intended for undergraduate and postgraduate students of electrical engineering.

KEY FEATURES

- In-depth coverage of DSP fundamentals
- Pedagogical tools like figures, flowcharts, block diagrams and tables have been extensively used
- Review questions are given at the end of each chapter
- Extensive references to literature on power system protection


Latest Print 2014 / 280 pp. / 17.8 x 23.5 cm
ISBN-978-81-203-4979-7 / ₹ 325.00 / (e-book also available)

CHAKRABARTI & HALDER

ABHIJIT CHAKRABARTI, Vice-Chancellor, Jadavpur University, Kolkata; Former Vice Chairman and Acting Chairman, West Bengal State Council of Higher Education; Professor of Electrical Engineering, Bengal Engineering and Science University, Shibpur, Howrah, West Bengal.

SUNITA HALDER, Lecturer, Department of Electrical Engineering, Jadavpur University, Kolkata.

This comprehensive textbook introduces electrical engineering students and engineers to the most relevant concepts and techniques relating to all dimensions of electrical power system planning, operation and control. With an emphasis on both basics and advanced topics and practical aspects, the topics are substantiated by a number of illustrations and computer programs that reinforce the analytical methods of approaches to operation and control problems of power system engineering.

Besides fundamentals of power systems, the readers can learn about power flow, economic considerations, computer-aided economic load despatch, power system stability, fault analysis, high voltage transmission systems, transient analysis, and much more from this systematic treatment of an exhaustive treatise on power system engineering.

The book is designed to cover courses in Power Systems conducted during third and fourth years of study by senior undergraduate students and to cover courses prescribed for postgraduate students as well.

The third edition includes the following eight new chapters to make the book complete from all angles of fundamental and advanced topics.

- Transmission Line Parameters (Chapter 2)
- Steady State Performance and Operation of Transmission Lines (Chapter 3)
- Power Cables (Chapter 4)
- Line Insulators (Chapter 5)
- Mechanical Design of Overhead Lines (Chapter 6)
- Corona (Chapter 7)
- EHV AC and HVDC Power Transmission (Chapter 17)
- Transient Analysis of Transmission Lines: Wave Propagation (Chapter 23)


Latest Print 2012 / 1272 pp. / 17.8 x 23.5 cm
ISBN-978-81-203-4015-2 / ₹ 595.00 / (e-book also available)

CHAKRABARTI, et al.

ABHIJIT CHAKRABARTI, Vice-Chancellor, Jadavpur University, Kolkata; Former Vice Chairman and Acting Chairman, West Bengal State Council of Higher Education; Professor of Electrical Engineering, Bengal Engineering and Science University, Shibpur, Howrah, West Bengal.

D.P. KOTHARI, Former, Vice Chancellor, VIT University, Vellore, and Director-in-Charge, IIT Delhi.

A.K. MUKHOPADHYAY, former Vice Chancellor of Tripura University and former Professor of Electrical Engineering in the Department of Applied Physics of Calcutta University.

ABHINANDAN DE, Assistant Professor, IIEST, Shibpur.

This text, intended for the students pursuing postgraduate programmes in Electrical Engineering, focuses special attention on the implications of reactive power in voltage stability of transmission systems. The basic concepts of power system stability and other operational aspects have been discussed. Both the advanced and the practical aspects have been highlighted. Modern concepts and applications, theoretical as well as simulated study, have been presented wherever necessary. In brief, the text presents a complete overall overview of the research and engineering aspects of the problem of stability, suitable both for academics and practising engineers, along with a brief historical review of the concerned topics.

In some instances the authors have included some of their own research results while maintaining the uniformity of overall treatment of the book. The text is replete with examples and is backed up by analytical derivations and physical interpretations, wherever considered necessary.


Latest Print 2015 / 272 pp. / 16.0 × 24.1 cm
ISBN-978-81-203-4050-3 / ₹ 250.00 / (e-book also available)

CHAKRABARTI

Power System Dynamics and Simulation

ABHIJIT CHAKRABARTI, Vice-Chancellor, Jadavpur University, Kolkata; Former Vice Chairman and Acting Chairman, West Bengal State Council of Higher Education; Professor of Electrical Engineering, Bengal Engineering and Science University, Shibpur, Howrah, West Bengal.

This comprehensive textbook introduces electrical engineering students and engineers to the various aspects of power system dynamics. It focuses on explaining and analysing the dynamic performance of such systems which are important for both system operation and planning.

The aim of this book is to present a comprehensive treatise in order to study the dynamics and simulation of the power networks. After going through the complete text, the students will be able to understand fundamental dynamic behaviour and controls of power systems and to perform basic stability analysis. The topics substantiated by suitable illustrations and computer programs describe analytical aspects of operation and characteristic of power system from the view point of steady state and dynamic condition.

This text serves as a well-knit introduction to Power System Dynamics and is suitable for a one-semester course for the senior-level undergraduate students of electrical engineering and postgraduate students specializing in Power Systems.


Latest Print 2009 / 532 pp. (Hard Cover)
15.3 × 22.9 cm / ISBN-978-81-203-3484-7 / ₹ 475.00

DESHPANDE

Elements of Electrical Power Station Design

Late (Professor) M.V. DESHPANDE, former Professor and Head Department of Electrical Engineering, L.D. College of Engineering, Ahmedabad and College of Engineering, Pune.

This comprehensive textbook is primarily aimed at undergraduate engineering students of Electrical Engineering, both at degree and diploma level.

The book covers preliminary designs and economic
loading of diesel-electric stations, steam stations, nuclear power stations and hydroelectric stations. It discusses load forecasting, economic load dispatch, unit commitment problem, methods of scheduling stations, allocation control, system reliability and system security. Trends in power plant instrumentation and control are also presented. The important problems of pollution control and performance standards of thermal power stations are discussed. The application of computers in power systems is touched.

The book also explains the need of using unconventional sources of energy and plants, like biogas plants, biomass plants, solar electric system and wind electric system to save fossil fuels. Rural energy demands and methods of forecasting energy demands are elaborated.


Latest Print 2011 / 468 pp. / 17.8 × 23.5 cm
ISBN-978-81-203-3647-6 / ₹ 395.00 / (e-book also available)

INDULKAR, KOTHARI & RAMALINGAM


C.S. INDULKAR, has been Professor of Electrical Engineering, Indian Institute of Technology Delhi as well as Visiting Professor, University of Technology, Papua New Guinea.

D.P. KOTHARI, Former, Vice Chancellor, VIT University, Vellore, and Director-in-Charge, IIT Delhi.

K. RAMALINGAM, Managing Director, Super Airport Infrastructure (India), and Independent Director on the Board of CIAL Aviation Academy, Cochin International Airport.

This book, now in its second edition, presents a comprehensive exposition of the basic principles involved in the analysis and computation of power system transients using a statistical approach. The book deals with probability distribution of switching overvoltages in overhead lines, underground cables, and machine windings. The accuracy of statistical methods for power system transients, including the suitability of Gaussian distribution for these methods, is discussed. In the case of overhead lines, a simplified statistical method for estimating the phase-to-phase risk of insulation failure is explained.

The new edition covers the latest research developments in this field. Analysis and modelling of noise as well as prediction of voltage sags in power lines, statistical evaluation of lightning overvoltages, application of ANN algorithm, and use of correlation algorithm for identification of inrush and fault currents in transformers are the major topics presented. Waveshape-based analysis of switching overvoltages and design procedure for insulation coordination are also dealt with in detail.

Designed primarily as a text for courses on power systems offered as part of undergraduate and postgraduate programmes in electrical engineering, the book is also highly useful for practising engineers, researchers and academics.


Latest Print 2012 / 296 pp. / 16.0 × 24.1 cm
ISBN-978-81-203-4079-4 / ₹ 275.00 / (e-book also available)

KOTHARI & DHILLON

Power System Optimization, 2nd ed.

D.P. KOTHARI, Former, Vice Chancellor, VIT University, Vellore, and Director-in-Charge, IIT Delhi.

J.S. DHILLON, Professor, Department of Electrical and Instrumentation Engineering, Sant Longowal Institute of Engineering and Technology, Longowal.

Power System Optimization is intended to introduce the methods of multi-objective optimization in integrated electric power system operation, covering economic, environmental, security and risk aspects as well.
Evolutionary algorithms which mimic natural evolutionary principles to constitute random search and optimization procedures are appended in this new edition to solve generation scheduling problems. Written in a student-friendly style, the book provides simple and understandable basic computational concepts and algorithms used in generation scheduling so that the readers can develop their own programs in any high-level programming language. This clear, logical overview of generation scheduling in electric power systems permits both students and power engineers to understand and apply optimization on a dependable basis. The book is particularly easy-to-use with sound and consistent terminology and perspective throughout.

This edition presents systematic coverage of local and global optimization techniques such as binary- and real-coded genetic algorithms, evolutionary algorithms, particle swarm optimization and differential evolutionary algorithms. The economic dispatch problem presented, considers higher-order nonlinearities and discontinuities in input–output characteristics in fossil fuel burning plants due to valve-point loading, ramp-rate limits and prohibited operating zones. Search optimization techniques presented are those which participate efficiently in decision making to solve the multiobjective optimization problems. Stochastic optimal generation scheduling is also updated in the new edition. Generalized Z-bus distribution factors (GZBDF) are presented to compute the active and reactive power flow on transmission lines. The interactive decision making methodology based on fuzzy set theory, in order to determine the optimal generation allocation to committed generating units, is also discussed.

This book is intended to meet the needs of a diverse range of groups interested in the application of optimization techniques to power system operation. It requires only an elementary knowledge of numerical techniques and matrix operation to understand most of the topics. It is designed to serve as a textbook for postgraduate electrical engineering students, as well as a reference for faculty, researchers, and power engineers interested in the use of optimization as a tool for reliable and secure economic operation of power systems.

KEY FEATURES
The book discusses:

- Load flow techniques and economic dispatch—both classical and rigorous
- Economic dispatch considering valve-point loading, ramp-rate limits and prohibited operating zones
- Real coded genetic algorithms for economic dispatch
- Evolutionary programming for economic dispatch
- Particle swarm optimization for economic dispatch
- Differential evolutionary algorithm for economic dispatch
- Stochastic multiobjective thermal power dispatch with security
- Generalized Z-bus distribution factors to compute line flow
- Stochastic multiobjective hydrothermal generation scheduling
- Multiobjective thermal power dispatch using artificial neural networks
- Fuzzy multiobjective generation scheduling
- Multiobjective generation scheduling by searching weight pattern


PAITHANKAR & BHIDE
Fundamentals of Power System Protection, 2nd ed.
Y.G. PAITHANKAR, formerly Professor and Head of Electrical Engineering Department at the Visvesvaraya National Institute of Technology, Nagpur.
S.R. BHIDE, Associate Professor of Electrical Engineering at the Visvesvaraya National Institute of Technology, Nagpur.

The electric power system is a highly complex and dynamic entity. One malfunction or a carelessly set relay can jeopardize the entire grid. Power system protection as a subject offers all the elements of intrigue, drama, and suspense while handling fault conditions in real life. The book reflects many years of experience of the authors in teaching this subject matter to undergraduate electrical engineering students.

The book, now in its second edition, continues to provide the most relevant concepts and techniques in power system protection. The second edition offers a new chapter on circuit breakers to further strengthen the text and meet the curriculum needs of several universities. Both, students and teachers, will find the book stimulating as it contains around 300 well-annotated figures and numerous tables. It also includes 20 quiz sets consisting of about 200 multiple-choice questions to test the students’ understanding of the concepts discussed.

Written in a simple, clear and down-to-earth style, this state-of-the-art text covers the entire spectrum of protective relays—from electromechanical to numerical—for protection of transmission lines, transformers, busbars, generators, and motors. The presentation is stimulating, analytical but at the same time concise. The students will find the material very friendly and refreshingly simple.

The book has a wealth of useful figures, graphs, and block diagrams to help the students assimilate the concepts discussed and develop practical orientation.
This textbook, in its second edition, aims to provide undergraduate students of Electrical Engineering with a unified treatment of all aspects of modern power systems, including generation, transmission, and distribution of electric power, load flow studies, current, power flow studies and for solving Swing chart for computing symmetrical and unsymmetrical fault current, power flow studies and for solving Swing equation. Besides, this book includes flow chart for computing symmetrical and unsymmetrical fault current, power flow studies and for solving Swing equation. It is also fortified with a large number of solved numerical problems and short-answer questions with answers at the end of each chapter to reinforce the students understanding of concepts.

This textbook would also be useful to the postgraduate students of power systems engineering as a reference.
economic considerations, fault analysis and stability, high voltage phenomena, system protection, power control, and so on. The text systematically deals with the fundamental techniques in power systems, coupled with adequate analytical techniques and reference to practices in the field. Special emphasis is placed on the latest developments in power system engineering.

The book will be equally useful to the postgraduate students specialising in power systems and practising engineers as a reference.

**NEW TO THIS EDITION**

- Chapters on Elements of Electric Power Generation and Power System Economics are thoroughly updated.
- A new Chapter on Control of Active and Reactive Power is added.

**Contents:**


**SINGH**

**Electric Power Generation, Transmission and Distribution, 2nd ed.**

S.N. SINGH, Professor of Electrical Engineering at Indian Institute of Technology Kanpur.

This accessible text, now in its Second Edition, continues to provide a comprehensive coverage of electric power generation, transmission and distribution, including the operation and management of different systems in these areas. It gives an overview of the basic principles of electrical engineering and load characteristics and provides exhaustive system-level description of several power plants, such as thermal, electric, nuclear and gas power plants. The book fully explores the basic theory and also covers emerging concepts and technologies. The conventional topics of transmission subsystem including HVDC transmission are also discussed, along with an introduction to new technologies in power transmission and control such as Flexible AC Transmission Systems (FACTS). Numerous solved examples, interspersed throughout, illustrate the concepts discussed.

**WHAT IS NEW TO THIS EDITION**

- Provides two new chapters on Diesel Engine Power Plants and Power System Restructuring to make the students aware of the changes taking place in the power system industry.
- Includes more solved and unsolved problems in each chapter to enhance the problem solving skills of the students.

Primarily designed as a text for the undergraduate students of electrical engineering, the book should also be of great value to power system engineers.

**Contents:**


**SINGH**

**Switchgear and Power System Protection**

RAVINDRA P. SINGH, Principal, Applied College of Management and Engineering Palwal, Faridabad.

This comprehensive introduction to system protection covers the underlying principles of operation of switchgear and several relay protective schemes used in power systems and elucidates their important requirements to provide the basis for design criteria. Besides, the book contains a detailed treatment of protective schemes used to encounter fault conditions that may occur individually in generators, motors, transformers, busbars, and distribution circuits. Protection against switching surges and lightning is also discussed.

The final chapter on power system management provides a simple introduction to that important area in order to emphasize the importance of optimal economic operation of power systems in which protective schemes under fault conditions play a crucial role towards continuity of electrical supply with minimum damage to life, equipment and property.

**KEY FEATURES**

- Provides numerous solved examples and chapter-end exercises to reinforce understanding of concepts.
- Gives MATLAB programs to solve numerical problems.
The book is appropriate for undergraduate students of electrical engineering for a one-semester course in Power System Protection and Switchgear. It would also be useful to postgraduate students specializing in power engineering, research scholars and practising power engineers.


In the Third Edition, major judgments of Hon'ble Supreme Court relating to irregularities in power sector have been added. Power theft is very rampant in marijuana cultivation and is a source of social agony especially in the developed countries that has been described in the book with suitable photographs.

NEW TO THIS EDITION

In the Third Edition, major judgments of Hon'ble Supreme Court relating to irregularities in power sector have been added. Power theft is very rampant in marijuana cultivation and is a source of social agony especially in the developed countries that has been described in the book with suitable photographs.
students of power engineering and power management in several courses such as Power System Analysis, Electricity Deregulation, Power System Security, Restructured Power Systems, as well as laboratory courses in Power System Simulation.


Latest Print 2014 / 528 pp. / 17.8 × 23.5 cm
ISBN-978-81-203-4538-6 / ₹ 375.00 / (e-book also available)

Guided Electromagnetic Waves: Properties and Analysis

MICHAL MROZOWSKI, Technical University of Gdan’sk, Poland.

This book gives in-depth coverage of the full spectrum of propagating, evanescent and complex (semi-evanescent) modes. It elucidates the guided wave propagation phenomena and introduces useful analytical techniques that the students can easily apply in solving practical problems. Providing the necessary mathematical and electromagnetic background, the book discusses the various topics that concern the many classes of permittivity and permeability (isotropic, anisotropic, gyrotropic) and geometric symmetries of the waveguides themselves.

An important topic treated in this book is complex waves. It discusses the circumstances under which complex modes appear and explains how they relate to their accompanying propagating and evanescent modes.

The text is supplemented by four Appendices which offer the reader additional background regarding vector identities and properties of operators.

This book is suitable for students of electrical engineering and physics at postgraduate level as well as for researchers.


Latest Print 2008 / 392 pp. / 15.3 × 22.9 cm
ISBN-978-81-203-3483-0 / ₹ 395.00

Applied Electromagnetic Theory: Analyses, Problems and Applications

B. SOMANATHAN NAIR, Principal, Pankaja Kasthuri College of Engineering and Technology, Thiruvananthapuram (Kerala) and Visiting Professor, Department of Optoelectronics, University of Kerala.

S.R. DEEPA, Professor and Head, Department of Electronics and Communication Engineering, Pankaja Kasthuri College of Engineering and Technology, Thiruvananthapuram, and Visiting Professor, Department of Optoelectronics, University of Kerala.

Designed as a textbook for the students of electronics and communication engineering, and electrical and electronics engineering, it covers the subject of electromagnetism with a clear exposition of the theory in
assumption with the practical applications. The text explains the physical and mathematical aspects of the highly complicated electromagnetic theory in a very simple manner.

The book begins with an introductory chapter on vector theory and then moves on to explain the effectiveness of Ampere’s circuital law and Biot-Savart’s law in dealing with magnetostatic problems, derivation of Maxwell’s field equations from the fundamental laws of Faraday and Ampere, free-space solutions of wave equations, and the theory of skin effect. Finally, it concludes with the applications of Smith chart in solving transmission line problems and the theory of rectangular and circular waveguides.

**KEY FEATURES**
- Large number of solved examples and chapter-end problems
- Appendices to give the solutions of wave equations in waveguides
- Three-dimensional figures to illustrate theories
- Generalized solution of Maxwell’s equations

Besides undergraduate students of engineering, it would be useful for the postgraduate students of physics.


Latest Print 2015 / 384 pp. / 17.8 × 23.5 cm
ISBN-978-81-203-3339-0 / ₹ 325.00 / (e-book also available)

**PRAMANIK**

**Electromagnetism: Problems with Solutions, 3rd ed.**

ASHUTOSH PRAMANIK, Professor Emeritus in the Department of Electrical Engineering at the College of Engineering, Pune.

This Third Edition of the book contains more than 60 new problems over and above the original 480 problems of the Second Edition. The additional problems cover the whole range of new topics which will also be introduced in the third edition of the author’s main textbook titled Electromagnetism: Theory and Applications. There are some other new problems necessary to further enhance the understanding of the topics of importance already existing in the book.

There has been no change in the philosophy of this book. It has been designed to serve as a companion volume to the main text to help students gain a thorough quantitative understanding of EM concepts that are somewhat difficult to learn. The problems included, as a result of the author’s long industrial and academic experience, illuminate the concepts developed in the main text.

Besides meeting the needs of undergraduate students of electrical engineering and postgraduate students and researchers in physics, the book will also be immensely useful to engineers and applied physicists in industry.

**What is New to This Edition?**
1. A number of new problems on evaluation of a.c. resistance and reactance due to skin effect in cylindrical transmission line configurations, for which the cylindrical polar coordinate system cannot be used.
2. New problems on design and optimization of permanent magnets (now being used in the development of new permanent magnet machines) by using Fröhlich–Kennelly equation for representing the demagnetizing curve and Evershed criterion for optimizing the magnet dimensions and its material volume.
3. Some problems on applications of vector analysis to different geometrical configurations.
4. Some problems on Electrodynamics and Magnetostatics in which the method of images has been used as auxiliary support.
5. Nearly 18–20 new problems in the chapter on Electromagnetic Induction making it fully comprehensive and covering all facets of electromagnetic induction. This chapter now contains more than 60 solved problems, none of which are of the formula substitution type, and include problems ranging from annular homopolar machines to phenomenon of pinch effect, identification and separation of flux-linkage as well as flux cutting effects, etc.
7. Problems on Lorentz transformation in the chapter titled Electromagnetism and Special Relativity.


Latest Print 2012 / 920 pp. / 17.8 × 23.5 cm
ISBN-978-81-203-4633-8 / ₹ 550.00 / (e-book also available)
PRAMANIK

Electromagnetism, Volume I (Theory)

ASHUTOSH PRAMANIK, Professor Emeritus in the Department of Electrical Engineering at the College of Engineering, Pune.

This book [earlier titled as Electromagnetism: Theory and Applications which is bifurcated into two volumes: Electromagnetism: Theory and Electromagnetism: Applications (Magnetic Diffusion and Electromagnetic Waves)] has been updated to cover some additional aspects of theory and nearly all modern applications. The semi-historical approach is unchanged, but further historical comments have been introduced at various places in the book to give a better insight into the development of the subject as well as to make the study more interesting and palatable to the students.

KEY FEATURES
• Physical explanations of different types of currents
• Concepts of complex permittivity and complex permeability; and anisotropic behaviour of constitute parameters in different media and different conditions
• Vector co-ordinate system transformation equations
• Halbach magnets and the theory of one-sided flux
• Discussion on physical aspects of demagnetization curve of B-H loop for ferromagnetic materials
• Extrapolation of Frohlich-Kennelly equation used for the design and analysis of permanent magnet applications
• Physical aspects of Faraday’s law of electromagnetic induction (i.e., Fourth Maxwell’s field equation) through the approach of special relativity
• Extrapolation and elaboration of the concept of electromechanical energy conversion to both magnetic as well as electric field systems

Appendices contain in-depth analysis of self-inductance and non-conservative fields (Appendix 6), proof regarding the boundary conditions (Appendix 8), theory of bicylindrical co-ordinate system to provide the physical basis of the circuit approach to the cylindrical transmission line systems (Appendix 10), and properties of useful functions like Bessel and Legendre functions (Appendix 9).

The book is designed to serve as a core text for students of electrical engineering. Besides, it will be useful to postgraduate physics students as well as research engineers and design and development engineers in industries.


Latest Print 2014 / 696 pp. / 17.8 × 23.5 cm
ISBN-978-81-203-4888-2 / ₹ 525.00 / (e-book also available)

PRAMANIK

Electromagnetism, Volume 2—Applications (Magnetic Diffusion and Electromagnetic Waves)

ASHUTOSH PRAMANIK, Professor Emeritus in the Department of Electrical Engineering at the College of Engineering, Pune.

This book is a sequel to Electromagnetism: Theory (Volume I). It has been updated to cover some additional aspects of theory and nearly all modern applications. The semi-historical approach is unchanged, but further historical comments have been introduced at various places in the book to give a better insight into the development of the subject as well as to make the study more interesting and palatable to the students.

KEY FEATURES
• Emphasis on practical aspects of wave guidance and radiation
• Sections on analysis of cylindrical dielectric wave-guide (e.g. of optical fibres) in Chapters 18 and 22
• Tensor formulation of Maxwell’s Stresses
• Extension of Principle of Duality to time varying field problems as well as to non electrical systems
• Extrapolation of the method of images from partially embedded conduction current elements to discontinuous current elements with displacement currents in antennae problems
• Explanation of the physical basis of the mechanism of electromagnetic radiation
• Analysis of wave polarization including complete and partial polarization
• Effects of finite geometrical dimensions of the conducting media on the skin-effect phenomenon
• Types of apertures in receiving antennae

The book is designed to serve as a core text for students of electrical engineering. Besides, it will be useful to postgraduate physics students as well as research engineers and design and development engineers in industries.


Latest Print 2014 / 580 pp. / 17.8 × 23.5 cm
ISBN-978-81-203-4901-8 / ₹ 525.00 / (e-book also available)
RAO

Electromagnetic Waves and Transmission Lines

R.S. RAO, Professor in the Department of Electronics and Communication Engineering, Sree Vidyanikethan Engineering College, Tirupathi.

This systematic and well-written book provides an in-depth analysis of all the major areas of the subject such as fields, waves and lines. It is written in a simple and an easy-to-understand language.

Beginning with a discussion on vector calculus, the book elaborately explains electrostatics, including the concepts of electric force and field intensity, electric displacement, Gauss law, conductors, dielectrics and capacitors. This is followed by a detailed study of magnetostatics, covering Biot-Savart law, Lorentz’s force law and Ampere’s circuital law. Then, it discusses Maxwell’s equations that describe the time-varying fields and the wave theory which is the basis of radiation and wireless communications. Finally, the book gives a fair treatment to transmission line theory, which is a foundation course in mechanical engineering.

The text is well-supported by a large number of solved and unsolved problems to enhance the analytical skill of the students. The problems are framed to test the conceptual understanding of the students. It also includes plenty of objective type questions with answers.

It is intended as a textbook for the undergraduate students of Electrical and Electronics Engineering and Electronics and Communication Engineering for their course on Electromagnetic Waves and Transmission Lines.


Latest Print 2012 / 592 pp. / 17.8 × 23.5 cm  
ISBN-978-81-203-4515-7 / ₹ 425.00 / (e-book also available)

Electronic Devices and Circuits

KUMAR & JAIN

Electronic Devices and Circuits, 2nd ed.

BALBIR KUMAR, has been Additional Director at Bhagwan Parshuram Institute of Technology, Delhi.  
SHAIL B. JAIN, Professor, Department of Electronics and Communication Engineering, Indira Gandhi Institute of Technology, GGSIP University, Delhi.

Designed as a text for the students of various engineering streams such as electronics/electrical engineering, electronics and communication engineering, computer science and engineering, IT, instrumentation and control and mechanical engineering, this well-written text provides an introduction to electronic devices and circuits. It introduces to the readers electronic circuit analysis and design techniques with emphasis on the operation and use of semiconductor devices. It covers principles of operation, the characteristics and applications of fundamental electronic devices such as p-n junction diodes, bipolar junction transistors (BJTs), and field effect transistors (FETs), and special purpose diodes and transistors.

What distinguishes this text is that it explains the concepts and applications of the subject in such a way that even an average student will be able to understand working of electronic devices, analyze, design and simulate electronic circuits. This comprehensive book provides:

- A large number of solved examples.
- Summary highlighting the important points in the chapter.
- A number of Review Questions at the end of each chapter.
- A fairly large number of unsolved problems with answers.


Latest Print 2013 / 744 pp. / 17.8 × 23.5 cm  
ISBN-978-81-203-4844-8 / ₹ 425.00 / (e-book also available)

MOTTERSHEAD

Electronic Devices and Circuits: An Introduction

ALLEN MOTTERSHEAD, Cypress College.

The book is designed to follow a semester of AC and DC circuit theory and presumes no previous knowledge of electronic devices. The only mathematics necessary is intermediate algebra and trigonometry. Although the rate of change concept is used occasionally,
as in the determination of the thermal stability of a transistor amplifier, calculus is not necessary at all. The text provides a firm foundation in electronic devices and circuits for applications in the fields of communications and computers by covering an important link between basic electricity and advanced electronics applications.


Latest Print 2012 / 656 pp. / 17.8 × 23.5 cm
ISBN-978-81-203-3195-2 / ₹ 325.00 / (e-book also available)

NAGRATH
Electronic Devices and Circuits
I.J. NAGRATH, has been Professor and Deputy Director, Birla Institute of Technology & Science, Pilani.

Designed specifically for undergraduate students of Electronics and Electrical Engineering and its related disciplines, this book offers an excellent coverage of all essential topics and provides a solid foundation for analysing electronic circuits. It covers the course named Electronic Devices and Circuits of various universities. The book will also be useful to diploma students, AMIE students, and those pursuing courses in B.Sc. (Electronics) and M.Sc. (Physics).

The students are thoroughly introduced to the full spectrum of fundamental topics beginning with the theory of semiconductors and p-n junction behaviour. The devices treated include diodes, transistors—BJTs, JFETs and MOSFETs—and thyristors. The circuitry covered comprises small signal (ac), power amplifiers, oscillators, and operational amplifiers including many important applications of those versatile devices. A separate chapter on IC fabrication technology is provided to give an idea of the technologies being used in this area.

There are a variety of solved examples and applications for conceptual understanding. Problems at the end of each chapter are provided to test, reinforce and enhance learning.


Latest Print 2012 / 564 pp. / 17.8 × 23.5 cm

NAGRATH
Electronics: Analog and Digital, 2nd ed.
I.J. NAGRATH, has been Professor and Deputy Director, Birla Institute of Technology and Science, Pilani.

The second edition of this book has been updated and enlarged, especially the chapters on digital electronics. In the analog part, several additions have been made wherever necessary. Also, optical devices circuits have been introduced. Analog electronics spans semiconductors, diodes, transistors, small and large-signal amplifiers, OPAMPs and their applications. Both BJT and JFET, and MOSFET are treated parallelly so as to highlight their similarities and dissimilarities for thorough understanding of their parameters and specifications. The digital electronics covers logic gates, combinational circuits, IC families, number systems codes, adders/subtractors, flip-flops, registers and counters. Sequential circuits, memories and D/A and A/D convertor circuits are especially stressed. Fabrication technology of integrated devices and circuits have also been dealt with. Besides, many new examples and problems have been added section-wise.

The text is written in simple yet rigorous manner with profusion of illustrative examples as an aid to clear understanding. The student can self-study several portions of the book with minimal guidance.

A solution manual is available for the teachers.


NAIR
Electronic Devices and Applications
B. SOMANATHAN NAIR, Principal, Pankaja Kasthuri College of Engineering and Technology, Thiruvananthapuram (Kerala) and Visiting Professor, Department of Optoelectronics, University of Kerala.

This book is an outgrowth of a set of notes prepared by the author for the first and second year of undergraduate students of various disciplines of engineering and applied sciences, such as electronics, computer science, and information technology.

The text aims at giving clear and simplified explanations on the physical construction, relevant characteristics, principles of operation, and applications of several currently and widely used devices in electronic industries and research fields. As far as possible, mathematics is completely avoided. However, simple mathematical analyses are made in situations as and when they are required.


NIIT
Basics of Electronic Devices
This book presents a thorough introduction to physics of semiconductor materials and working principles of semiconductor devices and circuits. Practice assignments are included throughout to help students comprehend overall concepts.

You will gain a detailed understanding of:
- Applications of diode as a rectifier, clipper, and clamper.
- Different types of power supply filters.
- Various circuit configurations and biasing schemes of bipolar junction transistors.
- Single-stage, multistage, and RF transistor amplifiers.
- Basics of Field Effect Transistors (FETs).


PATIL
Basic Electronic Devices and Circuits
MAHESH B. PATIL worked at the Central Research Lab, Hitachi (1993) and at IIT Kanpur (1994–1999), prior to joining IIT Bombay in 1999 where he is currently a Professor.

This book provides detailed fundamental treatment of the underlying physics and operational characteristics of most commonly used semiconductor devices, covering diodes and bipolar transistors, optoelectronic devices, junction field-effect transistors, and MOS transistors. In addition, basic circuits utilising diodes, bipolar transistors, and field-effect transistors are described, and examples are presented which give a good idea of typical performance parameters and the associated waveforms.

A brief history of semiconductor devices is included so that the student develops an appreciation of the major technological strides that have made today’s IC technology possible. Important concepts are brought out in a simple and lucid manner rather than simply stating them as facts. Numerical examples are included to illustrate the concepts and also to make the student aware of the typical magnitudes of physical quantities encountered in practical electronic circuits. Wherever possible, simulation results are included in order to present a realistic picture of device operation. Fundamental concepts like biasing, small-signal models, amplifier operation, and logic circuits are explained. Review questions and problems are included at the end of each chapter to help students test their understanding.

The book is designed for a first course on semiconductor devices and basic electronic circuits for the undergraduate students of electrical and electronics engineering as well as for the students of related branches such as electronics and communication, electronics and instrumentation, computer science and engineering, and information technology.

SINGH
Electronic Devices and Integrated Circuits, 2nd ed.
AJAY KUMAR SINGH, Senior Lecturer, Faculty of Engineering and Technology (FET), Multimedia University (MMU), Malaysia.

This book, now in its Second Edition, provides a basis for understanding the characteristics, working principle, operation and limitations of semiconductor devices. In this new edition, many sections are re-written to present the concepts related to device physics in more clearer and easy to understand manner.

The primary objective of this textbook is to provide all the relevant topics on the semiconductor materials and semiconductor devices in a single volume. It includes enough mathematical expressions to provide a good foundation for the basic understanding of the semiconductor devices. It covers not only the state-of-the-art devices but also future approaches that go beyond the current technology.

Designed primarily as a text for the postgraduate students of physics and electronics, the book would also be useful for the undergraduate students of electronics and electrical engineering, and electronics and communication engineering.

Highlights of the Book:
- Includes topics on the latest technologies
- Covers important points in each chapter
- Provides a number of solved and unsolved problems along with explanation type questions
- Emphasizes on the mathematical derivation


Latest Print 2013 / 608 pp. / 17.8 × 23.5 cm
ISBN-978-81-203-4471-6 / ₹ 525.00 / (e-book also available)

Embedded Systems

CHATTOPADHYAY
Embedded System Design, 2nd ed.
SANTANU CHATTOPADHYAY, Professor at the Department of Electronics and Electrical Communication Engineering, Indian Institute of Technology Kharagpur.

Embedded system, as a subject, is an amalgamation of different domains, such as digital design, architecture, operating systems, interfaces, and algorithmic optimization techniques. This book acquaints the students with the alternatives and intricacies of embedded system design. It is designed as a textbook for the undergraduate students of Electronics and Communication Engineering, Electronics and Instrumentation Engineering, Computer Science and Engineering, Information Communication Technology (ICT), as well as for the postgraduate students of Computer Applications (MCA).

While in the hardware platform the book explains the role of microcontrollers and introduces one of the most widely used embedded processor, ARM, it also deliberates on other alternatives, such as digital signal processors, field programmable devices, and integrated circuits. It provides a very good overview of the interfacing standards covering RS232C, RS422, RS485, USB, IrDA, Bluetooth, and CAN.

In the software domain, the book introduces the features of real-time operating systems for use in embedded applications. Various scheduling algorithms have been discussed with their merits and demerits. The existing real-time operating systems have been surveyed. Guided by cost and performance requirements, embedded applications are often implemented partly in hardware and partly in software. The book covers the different optimization techniques proposed in the literature to take a judicious decision about this partitioning of application tasks. Power-aware design of embedded systems has also been dealt with.

In its second edition, the text has been extensively revised and updated. Almost all the chapters have been modified and elaborated including detailed discussion on hardware platforms—ARM, DSP, and FPGA. The chapter on “interfacing standards” has been updated to incorporate the latest information.

The new edition will be thereby immensely useful to the students, practitioners and advanced readers.

KEY FEATURES
- Presents a considerably wide coverage of the field of embedded systems
- Discusses the ARM microcontroller in detail
- Provides numerous exercises to assess the learning process
- Offers a good discussion on hardware–software codesign


Latest Print 2013 / 240 pp. / 17.8 × 23.5 cm
ISBN-978-81-203-4730-4 / ₹ 225.00 / (e-book also available)
RAO
Embedded Systems
B. KANTA RAO, Senior Professor, Department of Computer Science and Engineering, Gayatri College of Engineering, Visakhapatnam.

Designed as a textbook for the undergraduate students of electronics and communication engineering, electronics and instrumentation engineering, computer science and engineering, information communication technology as well as for the postgraduate students of computer applications (MCA), it lays the foundation for all readers on all possible applications of embedded processors.

This text deals with some of the interesting processors that will enlighten the need for new instructions and fast program implementation. The processors covered are the classic 8051 family, ATmega family, PIC family and Texas 430 family along with a good introduction to ARM processors.

KEY FEATURES
- Well designed hardware–software integrated programs and exercises
- Examples for each processor instruction set
- Extensive discussion on classic 8051 family including all recent developments


RAO
Energy Engineering and Management
AMLAN CHAKRABARTI, Professor and Head, Department of Electrical Engineering, Narula Institute of Technology, Kolkata.

This textbook is designed for senior students of B.Tech. in Electrical/Mechanical Engineering and first-year students of M.Tech. in Energy Management. The book will also be useful for MBA courses on Energy Management conducted by some universities through distance education mode.

The book also offers comprehensive study material for the certification examination for certified energy auditor of Bureau of Energy Efficiency, Government of India and for some industrial training programmes in the industry.

The book provides an exhaustive discussion of the energy analysis methodologies and tools to optimize the utilization of energy and how to enhance efficiency during conversion of energy from one form to another. It illustrates the energy analysis methods used in factories, transportation systems and buildings highlighting the various forms of use. It discusses the thermodynamic principles of energy conversion and constitution of energy balance equation for such systems.

The book examines the energy costs in our everyday life in terms of energy inputs in food cultivation. It also discusses similar energy costs of using fuels, other goods and services in our daily life.

KEY FEATURES
- Includes numerous questions and answers on energy management.
- Contains problems and solutions on energy management.
- Provides multiple choice questions useful for preparing for the certified energy auditor examination conducted by the Bureau of Energy Efficiency, Government of India.
- Includes 4 Case Studies.


BANERJEE
Engineering Materials
G.K. BANERJEE, Professor and Head, Department of Electrical Engineering, SET, IFTM University, Lodipur Rajput, Moradabad.

The book has been written in a lucid and systematic manner with necessary mathematical derivations, illustrations, examples and practise exercises providing a detailed description of the materials used in electrical and electronics engineering and their applications. Explaining the atomic structure of the materials, the book deals with the behaviour of dielectrics and their properties under the influence of DC and AC fields. It covers the magnetic properties of materials including soft and hard magnetic materials and their applications. The text discusses fabrication techniques and the basic physics involved in the operation of the semiconductors, junction transistors.
and rectifiers. It includes the detailed description of optical properties of materials, photovoltaic materials and the materials used in lasers and optical fibres. It also incorporates the latest information on the materials used for the direct energy conversion and fuel cell technologies.

This book is primarily intended for undergraduate students of electrical engineering and electrical and electronics engineering.

**KEY FEATURES**

- Contains sufficient numbers of solved numerical examples.
- Includes a set of review questions and a list of references at the end of each chapter.
- Provides a set of numerical problems in some of the chapters, wherever required.
- Contains more than 150 diagrammatic illustrations for easy understanding of the concepts.


2014 / 352 pp. / 17.8 x 23.5 cm
ISBN-978-81-203-5014-4 / ₹ 325.00 / (e-book also available)

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**High Voltage Engineering**

RAY

Introduction to High Voltage Engineering, An, 2nd ed.

SUBIR RAY, Professor, Department of Electrical and Electronics Engineering, MVJ College of Engineering, Bangalore.

This concise textbook is intended for undergraduate students of electrical engineering offering a course in high voltage engineering.

Written in an easy-to-understand style, the text, now in its Second Edition, acquaints students with the physical phenomena and technical problems associated with high voltages in power systems. A complete quantitative description of the topics in high voltage engineering is difficult because of the statistical nature of the electrical breakdown phenomena in insulators. With this in mind, this book has been written to provide a basic treatment of high voltage engineering qualitatively and, wherever necessary, quantitatively.

Special emphasis has been laid on breakdown mechanisms in gaseous dielectrics as it helps students gain a sound conceptual base for appreciating high voltage problems. The origin and nature of lightning and
switching overvoltages occurring in power systems have been explained and illustrated with practical observations. The protection of high voltage insulation against such overvoltages has also been discussed lucidly. The concept of modern digital methods of high voltage testing of insulators, transformers, and cables has been explained.

In the Second Edition, a new chapter on electrostatic field estimation and an appendix on partial discharges have been added to update the contents.

Solved problems help students develop a critical appreciation of the concepts discussed. End-of-chapter questions enable students to obtain a more in-depth understanding of the key concepts.


Latest Print 2013 / 268 pp. / 17.8 × 23.5 cm
ISBN-978-81-203-4740-3 / ₹ 275.00 / (e-book also available)

Industrial Electronics

PAUL

Industrial Electronics and Control including Programmable Logic Controller, 3rd ed.

BISWANATH PAUL, Fellow of NMIT (Australia), is with the Department of Electrical Engineering, Acharya Prafulla Chandra Ray Polytechnic, Jadavpur, West Bengal Technical Education, Kolkata.

The third edition of the book on Industrial Electronics and Control including Programmable Logic Controller is aimed at providing an explicit explanation of the mode of operation of different electronic power devices in circuits and systems that are in wide use today in modern industry for the control and conversion of electric power. The book strives to fulfil this need for a fundamental treatment that allows students to understand all aspects of circuit functions through its neatly-drawn illustrations and wave diagrams. Several colour diagrams are included to explain difficult circuits and waveforms. This approach will help students in assimilating the operation of power electronics circuits with more clarity.

Same as in previous editions, the book commences with a discussion on rectifiers, differential amplifiers, operational amplifiers, multivibrators, timers and goes on to provide in-depth coverage of power devices and power electronics circuits such as silicon controlled rectifiers (SCRs), inverters, dual converters, choppers, cycloconverters and their applications in the control of ac/dc motors, and heating and welding processes. The book also presents an overview of the modern developments in the field of optoelectronics and fibre optics. Finally, the book ends with a discussion on Programmable Logic Controller (PLC).

The book has an added advantage of multiple-choice questions, true/false statements, review questions and numerical problems at the end of each chapter, designed to reinforce the student’s understanding of the concepts and mathematical derivations introduced in the text.

The book is intended as a textbook for polytechnic students pursuing courses in electrical engineering, electronics and communication engineering, and electronics and instrumentation engineering.

This tailor-made book with its exhaustive explanations of circuit operations and its student-friendly approach should prove to be a boon to the students and teachers alike.

HIGHLIGHTS OF THE THIRD EDITION

• Introduces new sections on LM78xx series voltage regulators, 3524 PWM voltage regulators, Widlar and Wilson current mirror, adder or summing amplifier in non-inverting mode, adder-subtractor, instrumentation amplifier and precision rectifier.

• Incorporates many additional worked-out examples, making the reading more fruitful and enriching.

• Includes ample additional questions in the chapters on power supplies, differential amplifiers and operational amplifiers.


Latest Print 2014 / 640 pp. / 17.8 × 23.5 cm
ISBN-978-81-203-4990-2 / ₹ 495.00 / (e-book also available)

Instrumentation & Measurements

ANAND

Electronic Instruments and Instrumentation Technology

M.M.S. ANAND, Professor of Electronics and Instrumentation at Birla Institute of Technology & Science, Pilani. Presently, he also holds the position of Registrar of the Institute.

The standard laboratory tools in the modern scientific world include a wide variety of electronic instruments used in measurement and control systems. This book provides a firm foundation in principles, operation, design, and applications of electronic instruments. Commencing with electromechanical instruments, the
specialized instruments such as signal analyzers, counters, signal generators, and digital storage oscilloscope are treated in detail. Good design practices such as grounding and shielding are emphasized. The standards in quality management, basics of testing, compatibility, calibration, traceability, metrology and various ISO 9000 quality assurance guidelines are explained as well.

The evolution of communication technology in instrumentation is an important subject. A single chapter is devoted to the study of communication methods used in instrumentation technology.

There are some areas where instrumentation needs special type of specifications—one such area is hazardous area. The technology and standards used in hazardous areas are also discussed.

An instrumentation engineer is expected to draw and understand the instrumentation drawings. An Appendix explains the symbols and standards used in P&I diagrams with several examples.

Besides worked-out examples included throughout, end-of-chapter questions and multiple choice questions are also given to judge the student’s understanding of the subject.

Practical and state-of-the-art in approach, this textbook will be useful for students of electrical, electronics, and instrumentation engineering.


The book presents an exhaustive exposition of different types of measuring instruments and their applications in an easy-to-grasp manner. It presents even the minute details of various measurement techniques and calibration methods, which are the essential features of a measurement programme. The book elaborates on the theoretical background and practical knowledge of different measuring instruments to make the students accustomed to these devices. An in-depth coverage of topics makes the text useful to somewhat more advanced courses and its elaborated methodology will help students meet the challenges in their career.

This book is ideally suitable for undergraduate students (BE/B.Tech.) of Electrical, Electronics and Instrumentation and Control disciplines of engineering. It can be also used as reference book for the cable testing, testing of instruments transformers, testing of energy meters and measurement of physical variables.

KEY FEATURES
- Gives a number of chapter-end review questions and numerical problems for practice.
- Includes plenty of diagrams to clarify the concepts.
- Contains about 250 problems and 200 solved examples for the benefit of the students.


Latest Print 2012 / 872 pp. / 17.8 × 23.5 cm
ISBN-978-81-203-4526-3 / ₹ 575.00 / (e-book also available)

GHOSH
Introduction to Measurements and Instrumentation, 4th ed.
ARUN K. GHOSH, Visiting Professor, Sir J.C. Bose School of Engineering, Hooghly.

The fourth edition of this highly readable and well-received book presents the subject of measurement and instrumentation systems as an integrated and coherent text suitable for a one-semester course for undergraduate students of Instrumentation Engineering, as well as for instrumentation course/paper for Electrical/Electronics disciplines.

Modern scientific world requires an increasing number of complex measurements and instruments. The subject matter of this well-planned text is designed to ensure
that the students gain a thorough understanding of the concepts and principles of measurement of physical quantities and the related transducers and instruments. This edition retains all the features of its previous editions viz. plenty of worked-out examples, review questions culled from examination papers of various universities for practice and the solutions to numerical problems and other additional information in appendices.

NEW TO THIS EDITION
Besides the inclusion of a new chapter on Hazardous Areas and Instrumentation (Chapter 15), various new sections have been added and existing sections modified in the following chapters:

• Chapter 3 Linearisation and Spline interpolation
• Chapter 5 Classifications of transducers, Hall effect, Piezoresistivity, Surface acoustic waves, Optical effects (This chapter has been thoroughly modified)
• Chapter 6 Proximity sensors
• Chapter 8 Hall effect and Saw transducers
• Chapter 9 Proving ring, Prony brake, Industrial weighing systems, Tachometers
• Chapter 10 ITS-90, SAW thermometer
• Chapter 12 Glass gauge, Level switches, Zero suppression and Zero elevation, Level switches
• Chapter 13 The section on ISFET has been modified substantially


Latest Print 2012 / 948 pp. / 17.8 × 23.5 cm

GHOSH
Introduction to Transducers
ARUN K. GHOSH, Visiting Professor at Sir JC Bose School of Engineering, Hoagly.

Primarily intended as a textbook for undergraduate courses in applied electronics and instrumentation engineering, instrumentation and control engineering, electrical and electronics engineering and electronics and telecommunication engineering, this student-friendly book provides an in-depth coverage of transducers.

Organised in 12 chapters, the book
• presents a comprehensive classification of transducers based on common properties such as mechanical, resistive, inductive, capacitive, piezoelectric, magnetic, fibre-optic, ultrasonic and electrochemical;
• discusses the general principles of each group, showing their applications in sensing physical quantities such as pressure, temperature and so on;
• outlines the distinguishing features of transducers and elaborates on modern sensors based on optical fibres (intensity modulated, phase modulated and spectrally modulated sensors such as Bragg grating, Fabry–Pérot interferometer, Brillouin scattering sensor) and sensors based on surface acoustic wave; and
• contains numerous solved examples and review questions that illustrate the application of theory to reinforce the concepts.


Latest Print 2014 / 344 pp. / 17.8 × 23.5 cm
ISBN-978-81-203-5039-7 / ₹ 375.00 / (e-book also available)

JEROME
Virtual Instrumentation Using LabVIEW
JOVITHA JEROME, Professor and Head, Department of Instrumentation and Control Systems Engineering, PSG College of Technology, Coimbatore.

This book provides a practical and accessible understanding of the fundamental principles of virtual instrumentation. It explains how to acquire, analyze and present data using LabVIEW (Laboratory Virtual Instrument Engineering Workbench) as the application development environment.

The book introduces the students to the graphical system design model and its different phases of functionality such as design, prototyping and deployment. It explains the basic concepts of graphical programming and highlights the features and techniques used in LabVIEW to create Virtual Instruments (VIs). Using the technique of modular programming, the book teaches how to make a VI as a subVI. Arrays, clusters, structures and strings in LabVIEW are covered in detail. The book also includes coverage of emerging graphical system design technologies for real-world applications. In addition, extensive discussions on data acquisition, image acquisition, motion control and LabVIEW tools are presented.

This book is designed for undergraduate and postgraduate students of instrumentation and control engineering, electronics and instrumentation engineering, electrical and electronics engineering, electronics and communication engineering, and computer science.
and engineering. It will be also useful to engineering students of other disciplines where courses in virtual instrumentation are offered.

KEY FEATURES

• Builds the concept of virtual instrumentation by using clear-cut programming elements.
• Includes a summary that outlines important learning points and skills taught in the chapter.
• Offers a number of solved problems to help students gain hands-on experience of problem solving.
• Provides several chapter-end questions and problems to assist students in reinforcing their knowledge.


Latest Price 2013 / 416 pp. / 17.8 × 23.5 cm
ISBN-978-81-203-4030-5 / ₹ 395.00 / (e-book also available)

KRISHNA KANT
Microprocessor-Based Agri Instrumentation

KRISHNA KANT, Dean (Academic) at Jaypee Institute of Information Technology, Noida.

This book provides the fundamental concepts of system design using microprocessors in the field of agriculture instrumentation. It begins with an introduction to the field of agriculture and application of instrumentation in agriculture, and the book then covers the transducers specific to the agricultural field. The binary number system and arithmetic are covered as the basic building block of digital circuits and computer organization. The microprocessor basics and Intel 8085 hardware and software have been discussed in detail. The book describes microprocessor peripheral interfacing and its support chips such as Intel 8225, Intel 8253 and Intel 8279 along with their applications. It discusses analog to digital and digital to analog interfaces, CRT terminal interface and printer interface. In addition, the book includes case studies on various microprocessor applications in agriculture, such as microprocessor-based system design for grain moisture, safe grain storage, soil nutrient estimation and drip irrigation. Finally, the book ends with an advanced and futuristic topic on precision agriculture to give an exposure to students about future developments in the agricultural system.

KEY FEATURES

• From concepts to design, the book follows a step-by-step approach.
• Gives a large number of figures for easy understanding of theory.
• Includes a good number of examples and end-of-chapter exercises both in the hardware and software sections.
• Presents a number of case studies on the design of microprocessor-based agri-instrumentation systems.
• Offers exercises on the case studies which can be used for further development of the concepts.

The book is primarily intended for the undergraduate and postgraduate students of agricultural engineering for their courses on agri instrumentation and microprocessor applications in agriculture.


Latest Print 2015 / 476 pp. / 17.8 × 23.5 cm
ISBN-978-81-203-4086-2 / ₹ 395.00 / (e-book also available)

KRISHNASWAMY & PONNI BALA
Power Plant Instrumentation, 2nd ed.

K. KRISHNASWAMY, Dean, Curriculum Development and Student Affairs, Kongu Engineering College, Erode, Tamil Nadu.
M. PONNI BALA is with the Department of Electronics and Instrumentation Engineering, Kongu Engineering College.

The second edition of this text presents an overview of power generation and discusses the different types of equipment used in a steam thermal power generation unit.

The book describes various conventional and non-conventional energy sources. It elaborates on the instrumentation and control of water-steam and fuel-air flue gas circuits along with optimization of combustion. The text also deals with the power plant management system including the combustion process, boiler efficiency calculation, and maintenance and safety aspects. In addition, the book explains Supervisory Control and Data Acquisition (SCADA) system as well as turbine monitoring and control.

This book is designed for the undergraduate students of electronics and instrumentation engineering and electrical and electronics engineering.

New To This Edition

• A new chapter on Nuclear Power Plant Instrumentation is added, which elaborates how electricity is generated in a Nuclear Power Plant.

KEY FEATURES

• Includes numerous figures to clarify the concepts.
• Gives a number of worked-out problems to help students enhance their learning skills.
• Provides chapter-end exercises to enable students to test their understanding of the subject.

MATHIVANAN
PC-Based Instrumentation: Concepts and Practice
N. MATHIVANAN, Director, University Science Instrumentation Centre, Madurai Kamaraj University, Madurai.

This well-organized book is intended for the undergraduate students of Electrical, Electronics and Communications, Computer, Instrumentation and Instrumentation and Control Engineering; and postgraduate students of science in Electronics, Physics and Instrumentation.

Data acquisition being the core of all PC-based measurements and control instrumentation systems engineering, this book presents detailed discussions on PC bus based data acquisition, remote data acquisition, GPIB data acquisition and networked data acquisition configurations. This book also describes sensors, signal-conditioning and principles of PC-based data acquisition. It provides several latest and advanced techniques. This book stresses the need for understanding the use of Personal Computers in measurement and control instrumentation applications.

KEY FEATURES
• Provides several laboratory experiments to help the readers to gain hands-on experience in PC-based measurement and control.
• Provides a number of review questions/problems (with solutions to the odd numbered problems) and objective type questions with solutions.
• Presents a number of working circuits, design and programming examples.
• Presents comparison of properties, features and characteristics of different bus systems, interface standards, and network protocols.
• Includes the advanced techniques such as sigma–delta converter, RS-485, I2C bus, SPI bus, FireWire, IEEE-488.2, SCSI and Fieldbus standards.


MURTY
Transducers and Instrumentation, 2nd ed.
D.V.S. MURTY, formerly Professor of Electrical Engineering, Indian Institute of Technology Kharagpur.

This well-received and widely adopted text, now in its Second Edition, continues to provide an in-depth analysis of the fundamental principles of Transducers and Instrumentation in a highly accessible style. Professor D.V.S. Murty, who has pioneered the cause of development of Instrumentation Engineering in various engineering institutes and universities across the country, compresses his long and rich experience into this volume. He gives a masterly analysis of the principles and characteristics of transducers, common types of industrial sensors and transducers. Besides, he provides a detailed discussion on such topics as signal processing, data display, transmission and telemetry systems, all the while focusing on the latest developments. The text is profusely illustrated with examples and clear-cut diagrams that enhance its value.

NEW TO THIS EDITION
To meet the latest syllabi requirements of various universities, three new chapters have been added:

CHAPTER 12: Developments in Sensor Technology
CHAPTER 13: Sophistication in Instrumentation
CHAPTER 14: Process Control Instrumentation

Primarily intended as a text for the students pursuing Instrumentation and Control Engineering, this book would also be extremely useful to professional engineers and those working in R&D organisations.


PATRANABIS
Instrumentation and Control
D. PATRANABIS, Professor and Head, Emeritus, Department of Applied Electronics and Instrumentation Engineering, Heritage Institute of Technology, Kolkata.

Instrumentation and control plays a crucial role in the field of automation. This book presents an in-depth
analysis of the essential concepts of the instrumentation and control systems. The book introduces the students to instrumentation system and explains its designs, component selection and environmental effects. The statistical methods of data analysis and estimation of uncertainties are presented for an appropriate evaluation of the measured values. Dimensional metrology including the recent advancements is presented in an easy-to-grasp manner. The book also covers measurement of force, torque, shaft power and acceleration besides discussing signal conditioning and various display devices in a simple but effective style. Finally, it explains the time and frequency-measuring system, control theory and practice and various measurement-instruments as well as the nuclear techniques.

Designed for undergraduate and postgraduate students of electrical and instrumentation engineering, electrical and electronics engineering and mechanical engineering, this book will also be equally useful for the practising engineers and professionals.

KEY FEATURES

- Contains numerous figures and tables to clarify the concepts.
- Incorporates solved examples to impart practical knowledge to the students.
- Provides chapter-end review exercises to test students’ understanding of the subject.


Latest Print 2011 / 392 pp. / 17.8 × 23.5 cm
ISBN-978-81-203-4246-0 / ₹ 325.00 / (e-book also available)

PATRANABIS
Principles of Electronic Instrumentation
D. PATRANABIS, Professor and Head, Department of Applied Electronics and Instrumentation Engineering, Heritage Institute of Technology, Kolkata.

This text offers comprehensive coverage of electronic instruments and electronics-aided measurements, highlighting the essential components of digital electronic instrumentation and the principles involved in electrical and electronic measurement processes. It also explains the stages involved in data acquisition systems for acquiring, manipulating, processing, storing, displaying and interpreting the sought-for data.

The principal instruments presented in this book include cathode ray oscilloscope (CRO), analyzers, signal generators, oscillators, frequency synthesizers, sweep generators, function generators and attenuators. Besides, the book covers several laboratory meters such as phase meters, frequency meters, Q-meters, wattmeters, energy meters, power factor meters, and measurement bridges. Also included are a few important sensors and transducers which are used in the measurement of temperature, pressure, flow rate, liquid level, force, etc.

The book also emphasizes the growing use of fibre optic instrumentation. It explains some typical fibre optic sensing systems including the fibre optic gyroscope. Some applications of optical fibre in biomedical area are described as well.


A variety of worked-out examples and exercises serve to illustrate and test the understanding of the underlying concepts and principles.

ADDITIONAL FEATURES

- Provides the essential background knowledge concerning the principles of analogue and digital electronics
- Conventional techniques of measurement of electrical quantities are also presented
- Shielding, grounding and EMI aspects of instrumentation are highlighted
- Units, dimensions, standards, measurement errors and error analysis are dealt with in the appendices
- Techniques of automated test and measurement systems are briefly discussed in an appendix


Latest Print 2009 / 580 pp. / 17.8 × 23.5 cm
ISBN-978-81-203-3355-0 / ₹ 350.00

PATRANABIS
Sensors and Transducers, 2nd ed.
D. PATRANABIS, Professor and Head, Department of Applied Electronics and Instrumentation Engineering, Heritage Institute of Technology, Kolkata.

This text is a lucid presentation of the principles of
working of all types of sensors and transducers which form the prime components of the instrumentation systems. The characteristics of the sensors and transducers and the operating principles of transducer technologies have been discussed in considerable detail. Besides covering conventional sensors such as electromechanical, thermal, magnetic, radiation, and electroanalytical, the recent advances in sensor technologies including smart and intelligent sensors used in automated systems are also comprehensively described. The application aspects of sensors used in several fields such as automobiles, manufacturing, medical, and environment are fully illustrated.

With a straightforward approach the text is aimed at building a sound understanding of the fundamentals, and inculcating analytical skills needed for design and operation. Numerous schematic representations, examples, and review questions help transcend underlying basics to automation and instrumentation. The book with incisive explanations and all the pedagogic attributes is designed to serve the needs of the engineering students of instrumentation, chemical, mechanical, and electrical disciplines. It will also be a useful text for the students of applied sciences.


SAYER & MANSINGH
Measurement, Instrumentation and Experiment Design in Physics and Engineering
MICHAEL SAYER, Professor of Physics, Queen’s University at Kingston, Ontario, Canada.
ABHAI MANSINGH, Professor of Physics, and Director, South Campus, University of Delhi.

This book is designed to be used at the advanced undergraduate and beginning graduate level in physics, applied physics and engineering physics. The text explains, in a systematic and logical manner, the principles of experimental physics and physics related engineering to show how measurement, experiment design, signal processing and modern instrumentation can be used most effectively. Emphasis is laid on how to review techniques in important areas of application so that the reader develops his own insights and knowledge to work with any instrument and its manual. Questions are provided throughout to assist the reader towards this end. Laboratory practices in temperature measurement, optical techniques, electrical measurements and nuclear instrumentation have been covered in detail.


Latest Print 2014 / 380 pp. / 16.0 × 24.1 cm

Introduction to Electrical Engineering
GANGULI
Introduction to Electrical Engineering
PARTHA KUMAR GANGULI, Associate Professor in the Department of Electrical Engineering, Shekhawati Engineering College, Dundlod, Jhunjhunu, Rajasthan.

Introduction to Electrical Engineering presents a comprehensive coverage of a broad range of key topics including principles and techniques, industrial applications, transformers and AC/DC machine operation. The book has an excellent blend of theory and solved examples. Following a simple and engaging style, this book can be considered as a single source information meeting the requirements of the reader. It is intended for catering the needs of engineering students of all branches and eminently suited as a textbook for the students of B.E./B.Tech, AMIE and diploma courses in electrical engineering. Apart from this, the book would also be appreciated by all those students who are preparing for GATE and UPSC competitive examinations as well as by the practising engineers.

KEY FEATURES
• Exclusive coverage of the syllabus prescribed for the undergraduate students of engineering.
• In-depth presentation of all key topics.
• Sufficient worked-out examples to support and reinforce concepts.
• Pedagogical features such as chapterwise key points to recall concepts and exercises as well as numerical problems with answers for practice.


Latest Print 2014 / 768 pp. / 17.8 × 23.5 cm
ISBN-978-81-203-4809-7 / ₹ 595.00 / (e-book also available)
GHOSH

Fundamentals of Electrical and Electronics Engineering, 2nd ed.

SMARAJIT GHOSH, Professor, Department of Electrical and Instrumentation Engineering, Thapar University, Patiala.

This second edition, extensively revised and updated, continues to offer sound, practically-oriented, modularized coverage of the full spectrum of fundamental topics in each of the several major areas of electrical and electronics engineering.

- Circuit Theory
- Electrical Measurements and Measuring Instruments
- Electric Machines
- Electric Power Systems
- Control Systems
- Signals and Systems
- Analog and Digital Electronics including introduction to microcomputers

The book conforms to the syllabi of Basic Electrical and Electronic Sciences prescribed for the first-year engineering students. It is also an ideal text for students pursuing diploma programmes in Electrical Engineering.

Written in a straightforward style with a strong emphasis on primary principles, the main objective of the book is to bring an understanding of the subject within the reach of all engineering students.

WHAT IS NEW TO THIS EDITION
- Fundamentals of Control Systems (Chapter 24)
- Fundamentals of Signals and Systems (Chapter 25)
- Introduction to Microcomputers (Chapter 32)
- Substantial revisions to chapters on Transformer, Semiconductor Diodes and Transistors, and Field Effect Transistors
- Laplace Transform (Appendix B)
- Applications of Laplace Transform (Appendix C)
- PSpice (Appendix E)

KEY FEATURES
- Numerous solved examples for sound conceptual understanding
- End-of-chapter review questions and numerical problems for rigorous practice by students
- Answers to all end-of-chapter numerical problems
- An objective type Questions Bank with answers to hone the technical skills of students for viva voce and preparation for competitive examinations.


Latest Print 2012 / 908 pp. / 17.8 × 23.5 cm
ISBN-978-81-203-3299-7 / ₹ 450.00 / (e-book also available)
KOTHARI & NAGRATH
Theory and Problems of Basic Electrical Engineering

D.P. KOTHARI, Former, Vice Chancellor, VIT University, Vellore, and Director-in-Charge, IIT Delhi.
I.J. NAGRATH, has been Professor and Deputy Director, Birla Institute of Technology and Science, Pilani.

This is a comprehensive and authoritative introductory textbook for a first course in basic electrical engineering that caters to undergraduate students of not only electrical engineering but also other engineering disciplines such as electronics, computer, mechanical, civil and chemical. The text provides an indepth coverage of three major areas of electrical engineering: electrical circuit analysis, electric machines, and measurement and instrumentation.

The basic concepts and the related techniques are covered in a lucid manner to provide a thorough grounding through a series of carefully crafted solved examples and problems, supplementary problems, multiple choice (objective type) questions and review questions. All these questions provide a sound and unified understanding of concepts through comprehensive drill in problem solving and help the reader to grasp the subject fully.

Contents:

Latest Print 2013 / 520 pp. / 17.8 × 23.5 cm
ISBN-978-81-203-1263-0 / ₹ 350.00

LOUIS
Elements of Electrical Engineering,
5th ed.

M. MARIA LOUIS has been Professor and Head of Electrical Engineering Department at NIT, Tiruchirapalli, Tamil Nadu. He has also served as Professor and Head and later Principal, Thiagarajar College of Engineering, Madurai; Director, Karunya University, Coimbatore; Principal, PSNA College of Engineering and Technology, Dindigul; and Christ The King Institute of Technology, Coimbatore.

There has been overwhelming response from the readers of this text. Based on their feedback and suggestions, this book has been enlarged and thoroughly revised in its Fifth Edition.

Besides updating the sixteen chapters of the previous edition, it now incorporates ten new chapters dealing with synchronous machines, single/three phase motors, ac commutator motors and stepper motors.

The present text, written in a lucid style, is the culmination of more than four decades of the author’s long experience in teaching of electrical engineering subjects, especially electrical machines at undergraduate and postgraduate levels.

KEY FEATURES
• Easy to follow, understand and implement.
• Includes about 440 worked-out examples.
• Contains 721 MCQs (with answers) to help students measure their understanding and analysing skills and evaluate their knowledge.
• Offers about 515 chapter-end exercises with answers to build problem solving skills and gain hands-on experience and self-confidence.
• Includes many real-life examples to enable students to analyse and implement theoretical concepts in real-life situations.
• Difficult concepts like commutation explained in great detail so as to make students grasp concept with clear understanding.

The book is primarily designed for undergraduate and postgraduate students of Electrical and Electronics Engineering. Besides, the students of all other branches of engineering will find this text useful for their course study.

Contents:

Latest Print 2014 / 992 pp. / 17.8 × 23.5 cm
ISBN-978-81-203-4852-3 / ₹ 695.00 / (e-book also available)

PRASAD
Fundamentals of Electrical Engineering,
3rd ed.

RAJENDRA PRASAD, former Professor and Head, Department of Electrical Engineering, National Institute of Technology (NIT), Patna.

This comprehensive book, in its third edition, continues to provide an in-depth analysis on the fundamental principles of electrical engineering. The exposition of
these principles is fully reinforced by many practical problems that illustrate the concepts discussed.

Beginning with a precise and quantitative detailing of the fundamentals of circuit theory, electro-static and electromagnetism and further details on the concept of electromechanical energy conversion. The book provides an elaborate and systematic analysis of the working principle, applications and construction of each electrical machine. In addition to circuit responses under steady state conditions, the book contains the chapters on dynamic responses of networks and analysis of a three-phase circuit.

In this third edition, two chapters on Electrical Power System and Domestic Lighting have been added to fulfill the syllabus requirement of various universities. The chapters discuss different methods of generating electrical power, economic consideration and tariff of power system, illumination, light sources used in lighting systems, conductor size and insulation, lighting accessories used in wiring systems, fuses and MCBs, meter board, main switch and distribution board, earthing methods, types of wiring, wiring system for domestic use and cost estimation of wiring system.

Designed as a text for the undergraduate students of almost all branches of engineering, the book will also be useful to the practising engineers as reference.

KEY FEATURES
• Discusses statements with numerical examples
• Includes answers to the numerical problems at the end of the book
• Enhances learning of the basic working principles of electrical machines by using a number of supporting examples, review questions and illustrative examples


Latest Print 2014 / 1064 pp. / 17.8 × 23.5 cm
ISBN-978-81-203-4188-3 / ₹ 695.00 / (e-book also available)

SINGH
Basic Electrical Engineering
S.N. SINGH, Professor in the Department of Electrical Engineering, IIT Kanpur.

This book presents comprehensive coverage of all the basic concepts in electrical engineering. It is designed for undergraduate students of almost all branches of engineering for an introductory course in essentials of electrical engineering.

This book explains in detail the properties of different electric circuit elements, such as resistors, inductors and capacitors. The fundamental concepts of dc circuit laws, such as Kirchhoff’s current and voltage laws, and various network theorems, such as Thevenin’s theorem, Norton’s theorem, superposition theorem, maximum power transfer theorem, reciprocity theorem and Millman’s theorem are thoroughly discussed. The book also presents the analysis of ac circuits, and discusses transient analysis due to switch operations in ac and dc circuits as well as analysis of three-phase circuits. It describes series and parallel RLC circuits, magnetic circuits, and the working principle of different kinds of transformers. In addition, the book explains the principle of energy conversion, the operating characteristics of dc machines, three-phase induction machines and synchronous machines as well as single-phase motors. Finally, the book includes a discussion on technologies of electric power generation along with the different types of energy sources.

KEY FEATURES
• Includes numerous solved examples and illustrations for sound conceptual understanding.
• Provides well-graded chapter-end problems to develop the problem-solving capability of the students.
• Supplemented with three appendices addressing matrix algebra, trigonometric identities and Laplace transforms of commonly used functions to help students understand the mathematical concepts required for the study of electrical engineering.


Latest Print 2013 / 460 pp. / 17.8 × 23.5 cm
ISBN-978-81-203-4188-3 / ₹ 325.00 / (e-book also available)

Introduction to Electronics Engineering
KAL
Basic Electronics: Devices, Circuits and IT Fundamentals
SANTIRAM KAL, Professor, Department of Electronics and Electrical Communication Engineering, Indian Institute of Technology Kharagpur.

This comprehensive and well-organized text discusses the fundamentals of electronic communication, such as devices and analog and digital circuits, which are so essential for an understanding of digital
electronics. Professor Santiram Kal, with his wealth of knowledge and his years of teaching experience, compresses, within the covers of a single volume, all the aspects of electronics—both analog and digital—encompassing devices such as microprocessors, micro-controllers, fibre optics, and photonics. In so doing, he has struck a fine balance between analog and digital electronics.

A distinguishing feature of the book is that it gives case studies in modern applications of electronics, including information technology, that is, DBMS, multimedia, computer networks, Internet, and optical communication. Worked-out examples, interspersed throughout the text, and the large number of diagrams should enable the student to have a better grasp of the subject. Besides, exercises, given at the end of each chapter, will sharpen the student’s mind in self-study. These student-friendly features are intended to enhance the value of the text and make it both useful and interesting.


Electronic devices are ubiquitous in modern society. They are found in a wide variety of applications, from simple household devices to complex systems like computers and communication networks. This book provides detailed fundamental treatment of the underlying physics and operational characteristics of most commonly used semiconductor devices, covering diodes and bipolar transistors, optoelectronic devices, junction field-effect transistors, and MOS transistors. In addition, basic circuits utilising diodes, bipolar transistors, and field-effect transistors are described, and examples are presented which give a good idea of typical performance parameters and the associated waveforms.

A brief history of semiconductor devices is included so that the student develops an appreciation of the major technological strides that have made today’s IC technology possible. Important concepts are brought out in a simple and lucid manner rather than simply stating them as facts. Numerical examples are included to illustrate the concepts and also to make the student aware of the typical magnitudes of physical quantities encountered in practical electronic circuits. Wherever possible, simulation results are included in order to present a realistic picture of device operation. Fundamental concepts like biasing, small-signal models, amplifier operation, and logic circuits are explained. Review questions and problems are included at the
end of each chapter to help students test their understanding.

The book is designed for a first course on semi-conductor devices and basic electronic circuits for the undergraduate students of electrical and electronics engineering as well as for the students of related branches such as electronics and communication, electronics and instrumentation, computer science and engineering, and information technology.


Latest Print 2013 / 384 pp. / 17.8 × 23.5 cm
ISBN-978-81-203-4729-8 / ₹ 325.00 / (e-book also available)

Microprocessors & Microcontrollers

BAHADURE

Microprocessors: The 8086/8088, 80186/80286, 80386/80486 and the Pentium Family

NILESH B. BAHADURE, Reader in the Department of Electronics and Telecommunication Engineering at Bhilai Institute of Technology, Durg.

This comprehensive text provides an easily accessible introduction to the principles and applications of microprocessors. It explains the fundamentals of architecture, assembly language programming, interfacing, and applications of Intel’s 8086/8088 microprocessors, 8087 math coprocessors, and 8255, 8253, 8251, 8259, 8279 and 8237 peripherals. Besides, the book also covers Intel’s 80186/80286, 80386/80486, and the Pentium family microprocessors. The book throughout maintains an appropriate balance between the basic concepts and the skill sets needed for system design. A large number of solved examples on assembly language programming and interfacing are provided to help the students gain an insight into the topics discussed.

The book is eminently suitable for undergraduate students of Electrical and Electronics Engineering, Electronics and Instrumentation Engineering, Computer Science and Engineering, and Information Technology.


Latest Print 2014 / 680 pp. / 17.8 × 23.5 cm
ISBN-978-81-203-3942-2 / ₹ 425.00 / (e-book also available)

GHOSH & SRIDHAR

0000 to 8085: Introduction to Microprocessors for Engineers and Scientists, 2nd ed.

P.K. GHOSH, Professor at the Indian Institute of Technology Kanpur.
P.R. SRIDHAR, Electronics Engineer, Indian Institute of Technology Kanpur and presently working in OPTI-Inc., Santa Clara, California.

This is the second edition of the author’s popular book. The 8085 processor and its peripherals have been used to explain the basic concepts of microprocessor operation and system realization.

KEY FEATURES

• The peripheral devices are discussed comprehensively.
• It is probably the only microprocessor text that gives design principles along with complete circuit and printed circuit board details of a standalone microcomputer. This also serves as an outstanding illustration of practical realization of microprocessor-based systems.
• The text has been successfully tried out in instrumentation courses and also in national workshops on microprocessor systems.
• In the present edition, a sample set of monitor routines has been given, the number of problems has been substantially increased, and full solutions to the extended problem set have been provided.


Latest Print 2013 / 328 pp. / 21.6 × 27.8 cm
KRISHNA KANT
Microprocessors and Microcontrollers: Architecture, Programming and System Design 8085, 8086, 8051, 8096, 2nd ed.

KRISHNA KANT, Dean (Academic) at Jaypee Institute of Information Technology, Noida.

This book provides the students with a solid foundation in the technology of microprocessors and microcontrollers, their principles and applications. It comprehensively presents the material necessary for understanding the internal architecture as well as system design aspects of Intel’s legendary 8085 and 8086 microprocessors and Intel’s 8051 and 8096 microcontrollers. The book throughout maintains an appropriate balance between the basic concepts and the skill sets needed for system design. Besides, the book lucidly explains the hardware architecture, the instruction set and programming, support chips, peripheral interfacing, and cites several relevant examples to help the readers develop a complete understanding of industrial application projects. Several system design case studies are included to reinforce the concepts discussed.

With exhaustive coverage and practical approach, the book would be indispensable to undergraduate students of Electrical and Electronics, Electronics and Communication, and Electronics and Instrumentation Engineering. It can be used for a variety of courses in Microprocessors, Microcontrollers, and Embedded System Design.

The second edition of the book introduces additional topics like I/O interfacing and programming, serial interface programming, delay programming using 8086 and 8051. Besides, many more examples and case studies have been added.


MATHIVANAN
Microprocessors, PC Hardware and Interfacing

N. MATHIVANAN, Director, University Science Instrumentation Centre, Madurai Kamaraj University, Madurai.

Microprocessor is the most fundamental component in PC systems, and for learning the hardware organization and interfacing techniques, a complete knowledge of 8086 microprocessor is essential. This book thus provides a complete picture of the features and workings of microprocessor. It explains the architecture, instructions, programming, system design, peripheral devices, and interfacing.

Beginning with an overview of PC hardware from the original IBM PC to the recent Pentium systems, the book presents the internal architecture and instruction set of 8086 microprocessor and the design of an 8086 based system, and then describes the hardware and software of interfacing techniques to I/O buses and the standard ports in detail, substantiating them with examples and worked out programs in C++ and assembly language. Operations of advanced Intel microprocessors such as 80286, 80386, 80486, Pentium, Pentium Pro, Pentium MMX and Pentium II, and usage of the pins and signals of different types of I/O buses have also been covered in detail.

The book is useful for students of electronics and instrumentation engineering, and courses in communication.


MATHUR
Microprocessor 8085 and Its Interfacing, 2nd ed.

SUNIL MATHUR, Associate Professor, Department of Electronics and Communication Engineering, Maharaja Agrasen Institute of Technology, Guru Gobind Singh Indraprastha University, Delhi.

This comprehensive and thoroughly updated text now in its second edition continues to provide the complete knowledge about the Intel’s 8085 microprocessors, its programming and concept of interfacing of memory, Input/output devices and programmable peripheral chips.

Organized in four parts, Part I (Chapters 1–9) covers a review of the analog and digital signals as well as hardware and software related aspects of microprocessor...
8085. Part II (Chapters 10 and 11) discusses memory and input-output concepts, analog to digital and digital to analog converters and various memory and IO address decoding techniques. Part III (Chapters 12–17) explains the programmable interfacing chips with extensive interfacing examples. Part IV (Chapters 18 and 19) presents a brief discussion on other 8-bit microprocessors along with 16 and 32-bit Intel Processors. Each topic has been supported with numerous examples that will help students apply the concepts to other microprocessors in the course at advanced level.

This book is designed specifically for the undergraduate students of electronics and communication engineering, computer science and engineering, and information technology.

NEW TO THIS EDITION
- Chapters on "Architecture and Organization of Microprocessor" and "Instruction Set of 8085 Microprocessor" have been revised and modified substantially.
- Multiple choice questions have been added to all the chapters.


MATHUR
Microprocessor 8086: Architecture, Programming and Interfacing
SUNIL MATHUR, Associate Professor, Department of Electronics and Communication Engineering, Maharaja Agrasen Institute of Technology, Guru Gobind Singh Indraprastha University, Delhi.

Primarily intended for the undergraduate students of electronics and communication engineering, computer science and engineering, and information technology, this book skilfully integrates both the hardware and software aspects of the 8086 microprocessor. It offers the students an up-to-date account of the state-of-the-art microprocessors and therefore can be regarded as an incomparable source of information on recently developed microprocessor chips. The book covers the advanced microprocessor architecture of the Intel microprocessor family, from 8086 to Pentium 4.

The text is organized in four parts. Part I (Chapters 1–7) includes a detailed description of the architecture, organization, instruction set, and assembler directives of microprocessor 8086. Part II (Chapters 8–11) discusses the math coprocessor, multiprocessing and multiprogramming, the different types of data transfer schemes, and memory concepts. Part III (Chapters 12–15) covers programmable interfacing chips with the help of extensive interfacing examples. Part IV (Chapters 16–18) deals with advanced processors—from 80186 to Pentium 4.

This well-organized and student-friendly text should prove to be an invaluable asset to the students as well as the practising engineers.

KEY FEATURES
- Gives elaborate programming examples to develop the analytical ability of students.
- Provides solved examples covering different types of typical interfacing problems to develop the practical skills of students.
- Furnishes chapter-end exercises to reinforce the understanding of the subject.


PAL
Microcontrollers: Principles and Applications
AJIT PAL, Professor in the Department of Computer Science and Engineering at Indian Institute of Technology Kharagpur.

This book gives a comprehensive coverage of different aspects of microcontroller-based system design and development in a generalized manner. Basic ideas and fundamental concepts common to all microcontrollers have been introduced before giving specific examples using the 8051 microcontroller, which is the most popular microcontroller in use today. Coverage of the three important issues such as hardware, software and hardware-software integration has been provided in a balanced manner. For easy understanding of the subject, a bottom-up approach has been followed.

The book is designed for the undergraduate students...
of electrical engineering, computer science and engineering, and electronics and communication engineering.

**KEY FEATURES**

- Provides many pedagogical features such as learning objectives, introduction, examples, summary, fill in the blanks and chapter-end exercises to assist teaching and learning.
- Pays special attention to the interfacing of I/O devices for human interaction, and I/O devices for process control and instrumentation, which are important in the context of embedded systems.
- Gives comprehensive information about development aids and trouble-shooting techniques for the development of microcontroller-based systems.
- Includes a number of real-life application examples, with complete details of hardware and software implementation, after fabricating prototype models in the laboratory.


Latest Print 2014 / 392 pp. / 17.8 × 23.5 cm
ISBN-978-81-203-4392-4 / ₹ 350.00 / (e-book also available)

**SRINATH**

**8085 Microprocessor: Programming and Interfacing**

N.K. SRINATH, Professor and Head, Department of Information Science and Engineering, R.V. College of Engineering, Bangalore.

This up-to-date and contemporary book is designed as a first level undergraduate text on microprocessors for the students of engineering (computer science, electrical, electronics, telecommunication, instrumentation), computer applications and information technology. It gives a clear exposition of the architecture, programming and interfacing and applications of 8085 microprocessor. Besides, it provides a brief introduction to 8086 and 8088 Intel microprocessors.

The book focuses on:

- microprocessors starting from 4004 to 80586.
- instruction set of 8085 microprocessor giving the clear picture of the operations at the machine level.
- the various steps of the assembly language program development cycle.
- the hardware architecture of microcomputer built with the 8085 microprocessor.
- the role of the hardware interfaces: memory, input/output and interrupt, in relation to overall microcomputer system operation.
- peripheral chips such as 8255, 8253, 8259, 8257 and 8279 to interface with 8085 microprocessor and to program it for different applications.


Latest Print 2014 / 348 pp. / 17.8 × 23.5 cm
ISBN-978-81-203-2785-6 / ₹ 295.00 / (e-book also available)

**WADHWA**

**Microprocessor 8085: Architecture, Programming, and Interfacing**

AJAY WADHWA, Associate Professor, Department of Physics, SGTB Khalsa College, University of Delhi.

This book is designed as a first-level introduction to Microprocessor 8085, covering its architecture, programming, and interfacing aspects. Microprocessor 8085 is the basic processor from which machine language programming can be learnt. The text offers a comprehensive treatment of microprocessor’s hardware and software.

**DISTINGUISHING FEATURES**

- All the instructions of 8085 processor are explained with the help of examples and diagrams.
- Instructions have been classified into groups and their mnemonic hex codes have been derived.
- Memory maps of different memory sizes have been illustrated with examples.
- Timing diagrams of various instructions have been illustrated with examples.
- A large number of laboratory-tested programming examples and exercises are provided in each chapter.
- At the end of each chapter, numerous questions and problems have been given.
- Problems from previous years’ question papers have been separately given in each chapter.
- More than 200 examples and problems have been covered in the entire text.

This book is designed for undergraduate courses in B.Sc. (Hons) Physics and B.Sc. (Hons) Electronics. It will also be useful for the students pursuing B.Tech. degree/diploma in electrical and electronics engineering.


Latest Print 2012 / 172 pp. / 16.0 × 24.1 cm
ISBN-978-81-203-4013-8 / ₹ 150.00 / (e-book also available)
Microwave Engineering

RAO

Microwave Engineering

R.S. RAO, Professor in the Department of Electronics and Communication Engineering at Sree Vidyanikethan Engineering College, Andhra Pradesh.

This book presents the basic principles, characteristics and applications of commonly used microwave devices used in the design of microwave systems.

The book begins with a brief overview of the field of microwave engineering and then provides a thorough review of two prerequisite topics in electromagnetics, that is, electromagnetic field theory and transmission lines, so essential to know before analysing and designing microwave systems.

The book presents the full spectrum of both passive and active microwave components. Hollow pipe waveguides are thoroughly analysed with respect to their field components and other important characteristics such as bandwidth, dispersive nature, various impedances, and attenuation parameters. The basic principles of various types of microwave junctions used for power division, addition, and in measurement systems, such as tees, directional-couplers, circulators, gyrators, etc. are explained, along with their scattering parameters required for the analysis of microwave circuits. The text also presents a comprehensive analytical treatment of microwave tubes in common use, such as klystrons, magnetrons, TWTs, and solid state sources such as Gunn diodes, IMPATT diodes, funnel diodes and PIN diodes, etc.

Finally, the book describes the laboratory procedures for measurements of various parameters of circuits working at microwave frequencies.

The book contains an instructional framework at the end of each chapter composed of questions, problems, and objective type questions to enable students to gain skills in applying the principles and techniques learned in the text.

The book is appropriate for a course in Microwave Engineering at the level of both undergraduate and postgraduate students of Electronics and Communication Engineering.

Contents:

Latest Print 2012 / 512 pp. / 17.8 × 23.5 cm
ISBN-978-81-203-4514-0 / ₹ 350.00 / (e-book also available)

ROY & MITRA

Microwave Semiconductor Devices

SITESH KUMAR ROY, Chief Investigator of DRDO projects with Institute of Radiophysics and Electronics (IRPE), University of Calcutta, Kolkata. MONOJIT MITRA, Assistant Professor, Department of Electronics and Telecommunication Engineering, Bengal Engineering and Science University, Shibpur.

The main objective of this comprehensive text is to introduce the students the physics and the operational principles as well as the characteristics, and applications of the microwave semiconductor devices. These devices are making a revolutionary change in the field of communication and radars. As a result of the accelerating rate of growth of microwave technology in research and industry, students, engineers and scientists need to understand the theoretical and experimental design and analysis of these devices.

The book also deals with higher frequency micro-waves called millimeter waves, which are finding wide applications in ground and satellite communication, radars and missile guidance. Millimeter wave system development is one of the most advanced technologies in radio science, especially in view of the ever increasing demand of communication and saturation of microwave frequency range with increasing number of channels.

The book discusses in greater detail about the semiconductor devices such as IMPATT diodes, Gunn diodes, HEMT diodes and FET diodes. It emphasizes on various two and three terminal devices in the microwave and millimeter wave field based on silicon and Groups III-V compound semiconductors.

The book is intended to serve as a textbook for undergraduate electronics and electrical engineering students and postgraduate students of physics. It would also be a valuable reference book for professional engineers and physicists.

Contents:

Latest Print 2011 / 204 pp. / 17.8 × 23.5 cm

SANJAY KUMAR & SHUKLA

Concepts and Applications of Microwave Engineering

SANJAY KUMAR, Air Commodore at IAF, 9BRD, Pune. SAURABH SHUKLA, Scientist, Defence Avionics Research Establishment (DARE), DRDO, Bangalore.

The book is primarily designed to cater to the needs of undergraduate and postgraduate students of Electronics
and Communication Engineering and allied branches. The book has been written keeping average students in mind. This well-organised and lucidly written text gives a comprehensive view of microwave concepts covering its vast spectrum, transmission line, network analysis, microwave tubes, microwave solid-state devices, microwave measurement techniques, microwave antenna theories, radars and satellite communication.

**KEY FEATURES**

- A fairly large number of well-labelled diagrams provides practical understanding of the concepts.
- Solved numerical problems aptly crafted and placed right after conceptual discussion provide better comprehension of the subject matter.
- Chapter summary highlights important points for quick recap and revision before examination.
- About 200 MCQs with answers help students to prepare for competitive examinations.
- Appropriate number of unsolved numerical problems with answers improves problem solving skill of students.
- Simplified complex mathematical derivations by synthesising them in smaller parts for easy grasping.


**Latest Print 2009 / 392 pp. / 17.8 × 23.5 cm**

ISBN-978-81-203-3716-9 / ₹ 250.00

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**SRIVASTAVA & GUPTA**

**Microwave Devices and Circuit Design**

GANESH PRASAD SRIVASTAVA, Formerly, Professor of Electronics, University of Delhi.

VIJAY LAXMI GUPTA, Reader, Department of Electronic Science, University of Delhi.

This textbook presents a unified treatment of theory, analysis and design of microwave devices and circuits. It is designed to address the needs of undergraduate students of electronics and communication engineering for a course in microwave engineering as well as those of the students pursuing M.Sc. courses in electronics science. The main objective is to provide students with a thorough understanding of microwave devices and circuits, and to acquaint them with some of the methods used in circuit analysis and design.

Several types of planar transmission lines such as stripline, microstrip, slot line and a few other structures have been explained. The important concepts of scattering matrix and Smith chart related to design problems have been discussed in detail. The performance and geometry of microwave transistors—both bipolar and field effect—have been analysed. Microwave passive components such as couplers, power dividers, attenuators, phase shifters and circulators have been comprehensively dealt with. Finally, the analysis and design aspects of microwave transistor amplifiers and oscillators are presented using the scattering parameters technique.

Numerous solved problems and chapter-end questions are included for practice and reinforcement of the concepts.
Contents:

Latest Print 2013 / 480 pp. / 17.8 × 23.5 cm

GUPTA
Optoelectronic Devices and Systems, 2nd ed.
S.C. GUPTA, Senior Professor and Director (Academic), Raj Kumar Goel Institute of Technology, Ghaziabad.

This textbook, now in the second edition, offers a completely up-to-date and in-depth introduction to the principles and applications of optoelectronic devices and systems. The text gives a detailed description of optical fibre waveguides, optical fibre cables and their characteristics, manufacturing process and drawing of optical fibres. In addition, it deals with photon sources, photon detectors, fibre optics as a medium and LAN and WAN systems, short and long haul optical fibre communication systems, electro-optic modulators and their characteristics.

The second edition possesses a new section on Optical Fibre Based Broadband High Speed Network in Chapter 8, thus highlighting an updated version. Apart from this, a new chapter on Intensity Dependent Refractive Index Effect has been introduced into the text that discusses the effect of focusing on spatial and temperature profiles in a non-linear crystal medium. This chapter further explains the various physical phenomena like the creation of sharp opaque filaments, irradiation induced damaging of the crystal, oscillatory waveguide propagation, saturation effects and other properties in detail.

Primarily intended for the undergraduate students of electronics and communication engineering, the book should also prove extremely useful for the postgraduate students of physics.

KEY FEATURES
• Provides comprehensive explanation of optical fibre communication with illustrations.
• Gives extensive theory and experimental and holographic applications.
• Discusses the applications of lasers in industry, military and medical as well as fibre optics applications.
• Describes optical computing, optical gates and their applications with illustrations.
• Includes solved numericals at the end of book for better understanding of topics.

Contents:

Latest Print 2014 / 672 pp. / 17.8 × 23.5 cm
ISBN-978-81-203-5065-6 / ₹ 450.00 / (e-book also available)
GUPTA
Textbook on Optical Fiber Communication and Its Applications, 2nd ed.
S.C. GUPTA, Senior Professor and Director (Academic), Raj Kumar Goel Institute of Technology, Ghaziabad.

The Second Edition contains two additional chapters—one on optical fiber sensors and the other on optical fiber networks. These additions together with the material of the first edition provide a comprehensive treatment of optical fiber communication systems and their applications. The material is well presented and is designed for undergraduate students pursuing courses in electrical engineering, and electronics and telecommunication engineering.

The book offers a completely up-to-date, accessible, and in-depth introduction to the principles and applications of optical fiber communications. It describes the recent developments in optical fiber communication materials, devices, components, and systems.

The coverage includes key concepts such as properties of light, semiconductor materials, photon sources, optical receivers, LED and laser transmitters, optical homodyne and heterodyne detection systems, polarization penalty, connectorization and losses in optical fiber, photon–photon multiplexing using WDM and integrated optics, built-up of long haul OFC link at 8 Mbps and 2.5 Gbps, optical fiber applications in LAN/WAN and CCTV, underwater sea communication and long haul optical fiber communication.

KEY FEATURES
• Includes pyroelectric detectors and their applications.
• Provides detailed descriptions of short haul and long haul optical fiber links.
• Gives detailed treatment of semiconductor lasers, solid state and fiber lasers for optical communication.
• More rigorous treatment of theory by solved numericals for better understanding of topics.
• Discusses new topics, namely photon–photon multiplexing, and all optical networks.

Contents:

Latest Print 2013 / 532 pp. / 17.8 x 23.5 cm
ISBN-978-81-203-4580-5 / ₹ 395.00 / (e-book also available)

MAITY
Optoelectronics and Optical Fiber Sensors
ASIT BARAN MAITY, Professor and Dean in School of Applied Sciences, Haldia Institute of Technology, West Bengal.

Optoelectronics and Optical Fiber Sensors is a comprehensive and well-organised book that covers wide aspects of optoelectronic processes, optoelectronic devices, mostly used optical fibers and optical fiber sensor systems including maximum technical discussions.

The text highlights the details of design, material selection and working processes as well as the limitations of various optoelectronic fibres and fibre-optic sensor systems. Throughout the book, the attempt has been made to cover every important point related to this field from the fundamental concepts to the recent advancements as well as the future scope of the technical development in this exciting field.

Primarily designed for a course of optoelectronics/optoelectronics and fiber optics/optical fiber sensor at both undergraduate and postgraduate levels in electrical and electronics engineering, electronics and communication engineering, electronics and instrumentation engineering and applied physics, it would also be appreciated by practising engineers and scientists who want to update the information related to the latest developments in this field.

KEY FEATURES
• Provides an enormous information regarding the optical interactions, processes, devices and various other related topics to enlarge the scope of the book.
• Includes an in-depth presentation of important derivations to enhance the level of understanding.
• Incorporates a considerable number of worked-out numericals to reinforce the understanding of the concepts.
• Includes many pedagogical features such as chapterwise summary, exercises including probable problems and question bank and relevant references to provide a sound knowledge of various processes and systems.

Contents:

Latest Print 2013 / 280 pp. / 17.8 x 23.5 cm
ISBN-978-81-203-4781-6 / ₹ 250.00 / (e-book also available)
SATHISH KUMAR
Fundamentals of Optical Fibre Communication, 2nd ed.

M. SATHISH KUMAR, Professor in the Electronics and Communication Engineering at the Manipal Institute of Technology, Manipal.

Optical fibre communication is fast extending the boundaries of research laboratories and attaining the threshold of real-life applicability. The book attempts to provide a thorough understanding of the fundamentals of optical fibre communication.

Organized into nine chapters, this book begins with a discussion of planar dielectric waveguide and proceeds to discuss optical fibre and the propagation of light through it. It also covers Erbium Doped Fibre Amplifier (EDFA), semiconductor optical sources and detectors, fibre optic communication systems, and fibre optic measurements.

In the Second Edition, lucid presentation of the text has been maintained without compromising on the comprehension of the subject. Two new chapters on “advanced modulation formats for fibre optic communication systems” and “surface plasmon polaritons and photonic crystals” have been included which discuss topics such as fibre optic coupler, coherent optical communication, BER performance of coherent optical communication systems, differential phase modulation schemes with direct detection, surface plasmon polariton and photonic crystal. Besides, a number of chapters have been significantly revised.

This book is primarily intended as a text for undergraduate students of Electrical Engineering, Electronics and Communication Engineering, and Telecommunication Engineering. The book would also prove to be of immense benefit to postgraduate students of Physics and those preparing for AMIE and AMIETE exams.

KEY FEATURES
• Lucid discussion of concepts, ensuring easy comprehensibility of even advanced topics to undergraduate students.
• Numerical problems forming an integral part of the book, making it application-oriented.
• Solutions to chapter-end numerical problems provided at the end of the book.


Latest Print 2014 / 264 pp. / 17.8 × 23.5 cm ISBN-978-81-203-4905-6 / ₹ 295.00 / (e-book also available)
Beginning with the study of the characteristics of power switching devices, the text offers a thorough treatment of ac–ac converters, ac–dc converters, dc–dc converters, single-phase converters and inverters, helping students understand how switching converters can be made to generate almost any wave shape and frequency, how power converters are used in conjunction with electric drives, HVDC transmission systems, and so forth.

The topics included in the second edition are:

- A large number of waveforms, diagrams that provide a vivid picture of circuit actions.
- A variety of solved examples to strengthen concepts.
- Numerous review questions, solved problems and unsolved problems with answers to develop a clear understanding of the basic principles.


Latest Print 2012 / 572 pp. / 17.8 × 23.5 cm
ISBN-978-81-203-3840-1 / ₹ 395.00 / (e-book also available)

Power Plant Engineering

GUPTA

Power Plant Engineering

MANOJ KUMAR GUPTA, Associate Professor in the Department of Mechanical Engineering, Ujjain Engineering College, Ujjain.

This textbook has been designed for a one-semester course on Power Plant Engineering studied by both degree and diploma students of mechanical and electrical engineering. It effectively exposes the students to the basics of power generation involved in several energy conversion systems so that they gain comprehensive knowledge of the operation of various types of power plants in use today.

After a brief introduction to energy fundamentals including the environmental impacts of power generation, the book acquaints the students with the working principles, design and operation of five conventional power plant systems, namely thermal, nuclear, hydroelectric, diesel and gas turbine. The economic factors of power generation with regard to estimation and prediction of load, plant design, plant operation, tariffs and so on, are discussed and illustrated with the help of several solved numerical problems.

The generation of electric power using renewable energy sources such as solar, wind, biomass, geothermal, tidal, fuel cells, magneto hydrodynamic, thermoelectric and thermionic systems, is discussed elaborately.

The book is interspersed with solved problems for a sound understanding of the various aspects of power plant engineering. The chapter-end questions are intended to provide the students with a thorough reinforcement of the concepts discussed.


Latest Print 2014 / 356 pp. / 16.0 × 24.1 cm
ISBN-978-81-203-4612-3 / ₹ 350.00 / (e-book also available)
MALLICK

Practical Boiler Operation Engineering and Power Plant, 3rd ed.

AMIYA RANJAN MALLICK, General Manager (Power Plant), B.K. Birla Group of Industries, Maharashtra.

This book, now in its third edition, is a comprehensive presentation of the fundamental aspects of various processes operated in a thermal power plant. The major thrust in the book is given on the hands-on procedure to deal with the normal and emergency situations during plant operation.

Beginning from the fundamentals, the book explores the vast concepts of boilers and steam turbines along with their operation. Following a simple text format and easy-to-grasp language, the book explicates various real-life situation related topics involving commissioning, maintenance, control and instrumentation of a power plant.

Dealing with all the latest coverage, the book is written to address the requirements of the undergraduate students of power plant engineering. Besides this, the text would also cater to the needs of those candidates who are preparing for Boiler Operation Engineers (BOE) Examination and the students of postgraduate diploma course in thermal power plant engineering.

KEY POINTS

- Incorporates more than 500 self-test questions in chapter-end exercises to test the student’s grasp of the fundamental concepts.
- Involves numerous well labelled diagrams throughout the book leading to easy learning.
- Provides a separate question bank including several solved numerical problems that generally arise during the functioning of thermal power plants.

Contents:


Latest Print 2014 / 576 pp. / 17.8 × 23.5 cm
ISBN-978-81-203-4855-4 / ₹ 650.00 / (e-book also available)

Renewable Energy Technologies

ABBASI & ABBASI

Renewable Energy Sources: Their Impact on Global Warming and Pollution

TASNEEM ABBASI, Assistant Professor at the Centre for Pollution Control and Environmental Engineering, Pondicherry University, Pondicherry.

S.A. ABBASI, Senior Professor and Head at the Centre for Pollution Control and Environmental Engineering, Pondicherry University, Pondicherry.

Today, the tide has turned so strongly in favour of renewables that for the first time since the dawn of the fossil fuel era over two hundred years ago renewable energy technologies have started attracting more investment globally than that in the fossil fuel-based technologies.

This text provides a comprehensive and wide ranging introduction to various renewable energy technologies and their applications, such as solar, wind, biomass, biogas, wave, geothermal, tidal and small hydel. It provides a thorough understanding of the basic energy conversion processes taking place in various renewable energy-based equipment like heat engines, photovoltaics, wind turbines, windmills, wave machines, and so on. The text also deals with the impact of renewable energy sources on global warming and pollution.

The book is intended for courses in Environmental Sciences, Environmental/Electrical/Mechanical Engineering and Energy Studies at the undergraduate and postgraduate levels. It will also serve as a useful reference for scientists, technocrats and environmentalists.

India is generously endowed with renewable energy sources. I hope the present book by Prof. Tasneem Abbasi and Prof. S.A. Abbasi will help students, renewable energy professionals and even the general masses to understand various aspects of renewable energy technologies and their applications.

Contents:


Latest Print 2011 / 332 pp. / 17.8 × 23.5 cm
ISBN-978-81-203-3994-1 / ₹ 325.00 / (e-book also available)
AHMED

SIRAJ AHMED, Professor, Department of Mechanical Engineering, Maulana Azad National Institute of Technology (MANIT), Bhopal.

In the contemporary world, wind energy is emerging as one of the most viable alternatives to meet the challenge of increasing energy demand, particularly for electrical energy generation. It is clean, fuel-free and available almost in every country in the world and in abundance in off-shore. This book, now in its Second Edition, covers most of the essential engineering principles, theories and best practices for wind energy development for electricity generation with clear emphasis on state-of-the-art. In this edition, substantial addition has been made in the chapters on Aerodynamics, Siting, Wind Farm Design, and Wind Energy Economics.

This comprehensive book on wind energy is intended as a text for the undergraduate and postgraduate students of Mechanical/Electrical Engineering and students pursuing Energy Studies. It will also serve as a handbook and ready reference for practicing engineers and professionals in the field of wind energy.

KEY FEATURES
- Describes technological advances in wind energy.
- Deals with wind resource assessment methodology, instrumentation and advanced techniques.
- Discusses the concepts of aerodynamics for wind turbine blade and rotor.
- Provides in detail the design concepts for modern horizontal axis wind turbine.
- Covers layout design, micro-siting and modelling of wind farms.
- Analyzes the economics of wind energy projects for electricity generation.
- Focuses on the impact of wind energy on the environment.


Earnest
Wind Power Technology

JOSHUA EARNEST, Professor in the Department of Electrical and Electronics Engineering, National Institute of Technical Teachers’ Training and Research (NITTTR), Bhopal.

This comprehensive textbook provides engineering students the underlying principles of different types of grid connected renewable energy sources and in particular, the detailed underpinning knowledge required to understand the different types of grid connected wind power plants. A unique feature of this book is that along with every figure title, a brief explanation follows that helps the reader to understand the concepts without going back to the paragraphs again.

The saying that a picture is more than a thousand words is evident from the 260 illustrations. The relevant pictures, tables, graphs and ample worked-out examples accelerate the learning. The software based computer simulation examples of grid connected wind electric generators is another special characteristic of this book. Still, another unique feature is the inclusion of a chapter on the much sought after small wind turbine technologies.

Designed as a textbook for Renewable Energy courses offered in the undergraduate and diploma engineering programmes in most of the universities of India, the book can not only serve for the one-semester stream specific course on Renewable Energy or Wind Energy for senior level undergraduate students of electrical, mechanical, electronics and instrumentation engineering but also for the postgraduate engineering students.


Earnest & Wizelius
Wind Power Plants and Project Development, 2nd ed.

JOSHUA EARNEST, Professor in the Department of Electrical and Electronics Engineering, National Institute of Technical Teachers’ Training and Research (NITTTR), Bhopal.

TORE WIZELIUS, Wind Power Consultant, who has authored nine books on wind power (in Swedish and English). While working as a lecturer at Gotland University from 1998-2008 Tore Wizelius developed a number of online distance education university courses and also courses on wind power for technical university teachers in India, in cooperation with Prof. Joshua Earnest.

Won best publication award of 2011 jointly given by Global Wind Energy Council (GWEC), Belgium and WISE Pune

This book, now in its Second Edition, continues to give a wide and deep introduction to most aspects of this
renewable energy source. Based on the feedback from different quarters, most of the chapters of this second edition have been enriched and modified. On popular demand from the mechanical engineers, an additional chapter on ‘Gear Systems in Wind Turbines’ has also been added. As the previous edition, this revised version will continue to enlighten electrical, mechanical, instrumentation, electronics and civil engineers as well. Needless to say, this book will prove to be an asset even to those who already have the first edition of this book.

**What do Reviewers’ say?**

“This massive work is a welcome addition to any wind energy library—well illustrated with splendid photographs and drawings that I haven’t seen in any other book. An ardent learner can lucidly understand the basic wind turbine theory, design, and project development. I wish I’d written it!”

—Paul Gipe, USA, Author, Advocate and Renewable Industry Analyst, California

“Dr Joshua Earnest, author of numerous books on wind power, strikes a chord with everyone willing to think deeply about renewable energy and wind power in particular, as he tackles the most profound issues of wind power design and implementation. It is a true pleasure to read this extraordinary and inspiring ‘bible of wind power’.”

—Lars Hallén, Sweden, Founder and Chairman of LIFE Academy, Karlstad


—Dr. S. Gomathinayagam, India, Director General, National Institute of Wind Energy (NIWE) (formerly C-WET), Tamil Nadu

“This book is one of the most comprehensive books on wind energy, especially regarding the electrical systems of large wind power plants. I’m very pleased to see this new edition”.

—Sven Ruin, Sweden, Consultant for TEROC and Chairman of the Swedish Wind Power Association’s section on small-scale wind power


532 pp. (approx.) / (Hardbound in Colour) 21.6 × 27.8 cm / ISBN-978-81-203-5127-1

FORTHCOMING

KOTHARI, et al.

**Renewable Energy Sources and Emerging Technologies, 2nd ed.**

D.P. KOTHARI, Former, Vice Chancellor, VIT University, Vellore, and Director-in-Charge, IIT Delhi.

K.C. SINGAL, after graduation in Electrical Engineering in the year 1957 from Roorkee University (now IIT Roorkee), served in various capacities with Haryana State Electricity Board (HSEB) and retired as Chief Engineer Operation in the year 1992.

RAKESH RANJAN, Principal of International Institute of Technology and Business, Sonipat, Haryana.

This book, now in its Second Edition, is an introductory text on renewable energy sources, technologies and their applications—a subject which is becoming increasingly important worldwide. This edition includes two new chapters that introduce contemporary practices in renewable technologies. It also discusses issues on environmental degradation and its reasons and remedies.

Besides this, a large number of numerical problems to correlate theory with typical values and chapter-end review questions are also given to reinforce the understanding of the subject matter.

Written in an accessible style, this text is designed to serve the needs of undergraduate students in electrical, mechanical and civil engineering disciplines. It will also be useful for all higher-level courses in energy programmes and multi-disciplinary postgraduate courses in science and engineering.

**NEW TO THIS EDITION**

- Inclusion of two new chapters—‘Hybrid Systems’ and ‘Environment, Energy and Global Climate Change’.
- A new section on Distributed Energy System and Dispersed Generation.
- Appendices on
  - Smart grid and grid system in India
  - Remote village electrification with renewable energy sources
Indian Electricity Act 2003, which supports exploration of Renewable Energy.

**SALIENT FEATURES**

- Provides balanced introduction to all aspects of solar energy conversion including PV technology.
- Gives comprehensive coverage of all facets of wind power development.
- Explains small hydropower projects with illustrative figures.
- Emphasises the importance of availability of biofuel from Jatropha plant.
- Special attention is given to ‘gas hydrates’ and ‘hydrogen energy’ sources.
- Fuel cells are explained as per the latest technology available.
- Harnessing of ocean energy is dealt with in detail.
- Utilisation of biomass and solid waste for energy recovery is emphasised.


**LEAD FEATURES**

- About one hundred figures, fifty circuit diagrams and several design examples are given.
- A large number of problems are given at the end of some chapters.
- References are provided for further study and research.


**SAWHNEY Non-Conventional Energy Resources**

G.S. SAWHNEY, Professor and Head of the Department of Mechanical Engineering at Accurate Institute of Management and Technology, Greater Noida. Earlier, he was Professor and Head of the Department at GNIT, Greater Noida and LKIE, Ghaziabad.

There has been an enormous increase in the demand for energy as a result of industrial development and population growth. Due to the depletion of fossil fuels at a rapid pace, harnessing the power of clean, alternative energy resources has become a necessity. Thus, the book aims to increase awareness among readers about the renewable energy resources and the technologies used to harness them. Written in a lucid and precise manner, the text matter is structured in the question–answer format supported with numerous examples and illustrations. Besides discussing various renewable energy sources such as solar, wind, biogas, hydrogen, thermoelectric, tidal, geothermal, wave and thermal, the book also discusses energy management and environment and outlines Kyoto Protocol.

The book caters to the needs of undergraduate engineering students of all branches.

SOLANKI
Renewable Energy Technologies: A Practical Guide for Beginners
CHETAN SINGH SOLANKI, Associate Professor, Department of Energy Science and Engineering, Indian Institute of Technology Bombay.

This book presents a highly accessible introduction to the multi-disciplinary field of renewable energy sources—an area which is becoming increasingly important. It is intended to serve as a textbook for undergraduate electrical and mechanical engineering students and will also be useful for courses in environmental science.

The book helps beginners to understand the basic energy conversion processes involved in various renewable energy based equipment such as solar photovoltaics, solar water heaters, wind turbines, and biomass plants. Under each technology, several possible system configurations and their usages are considered. Step-by-step procedures are given to design and cost estimate several renewable energy based systems, designed for the given requirements. Numerous chapter-end problems are given to reinforce concepts, and for getting used to system design and system costing procedures.

Besides students, this book will be immensely useful for individuals interested in learning and practising renewable energy technologies.


Latest Print 2015 / 168 pp. / 16.0 × 24.1 cm
ISBN-978-81-203-3434-2 / ₹ 225.00 / (e-book also available)

SOLANKI
CHETAN SINGH SOLANKI, Associate Professor in the Department of Energy Science and Engineering at the Indian Institute of Technology Bombay (IITB).

This thoroughly revised text, now in its third edition, continues to provide a detailed discussion on all the aspects of solar photovoltaic (PV) technologies from physics of solar cells to manufacturing technologies, solar PV system design and their applications. The Third Edition includes a new chapter on "Advances in c-Si Cell Processes Suitable for Near Future Commercialization" (Chapter 8) to introduce the technological advancement in the commercial production to keep the readers up to date.

Organized in three parts, Part I introduces the fundamental principles of solar cell operation and design, Part II explains various technologies to fabricate solar cells and PV modules and Part III focuses on the use of solar photovoltaics as part of the system for providing electrical energy. In addition to this, numerous chapter-end exercises are given to reinforce the understanding of the subject.

The text is intended for the undergraduate and postgraduate students of engineering for their courses on solar photovoltaic technologies and renewable energy technologies. The book is of immense use for teachers, researchers and professionals working in the photovoltaic field. In a nutshell, this book is an absolute must-read for all those who want to understand and apply the basics behind photovoltaic devices and systems.


Latest Print 2015 / 540 pp. / 17.8 × 23.5 cm (Hard Cover)
ISBN-978-81-203-5111-0 / ₹ 550.00 / (e-book also available)
various aspects of solar PV technologies and systems in a student-friendly manner.

The text deals with the topics such as solar radiation, various types of batteries, their measurements and applications in SPV systems emphasizing the importance of solar PV technology in renewable energy scenario. It also discusses the method of estimating energy requirement; SPV modules, their formations and connection to arrays, grid-connected SPV captive power systems, tips over troubleshooting of components used in solar PV system, and system designs with plenty of illustrations on all topics covered in the book.

The text is supported by a large number of solved and unsolved examples, practical information using numerous diagrams and worksheet that help students understand the topics in a clear way.

The text is intended for technicians, trainers and engineers who are working on solar PV systems for design, installation and maintenance of solar PV systems.

Contents:
- Preface
- Acknowledgements
- Basics of Electricity
- Introduction to Energy and Solar Photovoltaic Energy
- Solar Cells
- Solar PV Modules
- Solar PV Module Arrays
- Basics of Batteries
- Applications of Batteries in Solar PV Systems
- Charge Controller, MPPT and Inverters
- Wires
- Solar PV System Design and Integration
- Grid-connected Solar PV Power Systems
- Installation, Troubleshooting and Safety

Latest Print 2014 / 320 pp. / 21.6 × 27.8 cm
ISBN-978-81-203-4711-3 / ₹ 525.00 / (e-book also available)

Robotic
Introduction to AI Robotics
ROBIN R. MURPHY, Associate Professor of Computer Science and Engineering, University of South Florida, Tampa.

This book attempts to cover all that is needed to program an artificially intelligent robot for applications involving sensing, navigation, planning, and uncertainty.

In the overview at the beginning of each chapter, the author touches upon anthropomorphic robots from classic films and science fiction stories before delving into the nuts and bolts of organizing intelligence in robots.

The book is divided into two parts—Part I: Robotic Paradigms and Part II: Navigation—Part I defines intelligent robots and introduces why artificial intelligence is needed. It covers the ‘theory’ of AI robotics, taking the reader through a historical journey from the Hierarchical to the Hybrid Deliberative/Reactive Paradigm for organizing intelligence, besides focusing on Reactive Paradigm and behaviours, techniques for reactive behaviours, and coordination and control of teams of multi-agents. Part II devotes three chapters to qualitative
Satellite Communication

MITRA

Satellite Communication

MONOJIT MITRA, Assistant Professor, Department of Electronics and Telecommunication Engineering, Bengal Engineering and Science University, Shibpur.

This compact text provides a thorough, readable treatment of the principles of satellite communication and its various technologies and components. It presents a clear analysis of subsystems of satellites, orbital mechanisms, launching mechanisms, earth and space systems employed in satellite links, and analog and digital communication through satellites. Besides, it explains the different methods used to access the various services provided by a satellite.

The text avoids complicated mathematical derivations, but the results of these derivations and their references are used throughout the book when required for understanding the technical concepts.

Primarily intended as a textbook for undergraduate students of electronics and communication engineering, telecommunication engineering, and information technology, this easy-to-understand book will also be useful as a reference for professional engineers.

KEY FEATURES

• Provides a cogent study of the effects of eclipse, gravitational forces of sun and moon, and earth’s oblateness on the orbit of satellites.
• Explains the effect of noise on the quality of signal over satellite communication links.
• Describes several satellite systems used for study of soil, ice mapping, forest management, and disaster management.
• Discusses satellite system development in the Indian context and apprises readers of India’s participation in international communication satellite systems to share and exchange data.


Latest Print 2014 / 180 pp. / 17.8 × 23.5 cm
ISBN-978-81-203-2786-3 / ₹ 225.00 / (e-book also available)

RAO


K.N. RAJA RAO, Professor, Department of Telecommunication Engineering and former Principal, R.V. College of Engineering, Bengaluru. He is also the Advisor at R.V. College of Engineering.

This new edition, an up-to-date and comprehensive title on the rapidly expanding field of satellite communication, is aimed at giving important aspects of space and satellite communication. It starts from fundamental concepts and helps reader to design satellite links. The book provides a smooth flow from satellite launch to various applications of satellite. It contains satellite systems, important parameter calculations and design concepts. The emphasis is on geostationary satellites. The text is organized in such a manner that the reader starts with orbiting parameters and ends at designing a complete multiple access links.

With all of the latest information incorporated and several key pedagogical attributes included, this textbook is an invaluable learning tool for the engineering students of electronics and communication.

NEW TO THIS EDITION

• Important design equations have been listed separately.
• Three new chapters—Reliability requirements in satellites, Remote sensing satellites and Error control coding—have been included.
• New Sections are added in Chapters 1, 2 and 3.
• A brief discussion on digitized video transmission is included in Chapter 4.

Latest Print 2013 / 412 pp. / 16.0 × 24.1 cm
ISBN-978-81-203-4840-0 / ₹ 295.00 / (e-book also available)

Signals and Systems

ANAND KUMAR

Signals and Systems, 3rd ed.
A. ANAND KUMAR, Principal, K.L. University College of Engineering, K.L. University, Vijayawada, Andhra Pradesh.

The Third Edition of this well-received text continues to provide coherent and comprehensive coverage of signals and systems. It is designed for undergraduate students of electronics and communication engineering, telecommunication engineering, electronics and instrumentation engineering, and electrical and electronics engineering. The book will also be useful to AMIE and IETE students.

Written with student-centred, pedagogically driven approach, the text provides a self-contained introduction to the theory of signals and systems. This book looks at the concepts of systems, and also examines signals and the way that signals interact with physical systems. It covers topics ranging from basic signals and systems to signal analysis, properties of continuous-time Fourier transforms including Fourier transforms of standard signals, signal transmission through linear systems, relation between convolution and correlation of signals, sampling theorems and techniques, and transform analysis of LTI systems. All the solved and unsolved problems in this book are designed to illustrate the topics in a clear way.

New to This Edition
MATLAB Programs at the end of each chapter

KEY FEATURES
• Numerous worked-out examples in each chapter
• Short questions with answers help students to prepare for examinations
• Objective type questions and unsolved problems at the end of each chapter to test the level of understanding of the subject.


Latest Print 2014 / 1044 pp. / 17.8 × 23.5 cm
ISBN-978-81-203-4840-0 / ₹ 525.00 / (e-book also available)

BANDYOPADHYAY
Introduction to Signals and Systems and Digital Signal Processing
M.N. BANDYOPADHYAY, Former Director, National Institute of Technology (NIT) Calicut. Earlier he was Director of NIT Kurukshetra.

With an interesting approach to educate the students in signals and systems, and digital signal processing simultaneously, this book not only provides a comprehensive introduction to the basic concepts of the subject but also offers a practical treatment of the modern concepts of digital signal processing.

Written in a cogent and lucid manner, the book is addressed to the needs of undergraduate engineering students of electrical, electronics, and computer disciplines, for a first course in signals and digital signal processing.

KEY FEATURES
• Detailed coverage of the signals, systems, and network concepts.
• Extensive treatment of mathematical tools like Fourier analysis, Laplace transformation, and Z-transformation.
• Lucid explanation of FIR, IIR, DFT, and FFT.
• Presentation of discrete time analysis of signals and systems, and discrete time systems in frequency domain.
• Solved examples in each chapter to reinforce the understanding of the topics covered.
• Numerous objective type questions and exercises.
• Discussion on practical applications of digital signal processing.


Latest Print 2015 / 396 pp. / 17.8 × 23.5 cm

GURUNG
Signals and Systems
J.B. GURUNG, Assistant Professor at the Department of Electronics and Communication Engineering, Lovely Professional University, Phagwara.

A valuable introduction to Signals and Systems, this textbook has been developed by the author from his experience of teaching this particular subject to undergraduate students. It is suitable for B.E./B.Tech students in such disciplines as Electrical Engineering, Electronics and Communication Engineering, Computer Science and Engineering, Information Technology, and Biomedical Engineering.
The book provides a clear understanding of the issues that students face in assimilating this highly mathematical subject. It is a comprehensive analytical treatment of signals and systems with a strong emphasis on solving problems. Each topic is supported by sufficient numbers of solved examples. Besides, a variety of tricky objective type questions have been included at the end of every chapter.

Emphasizing systems approach, the book offers a unified treatment of both continuous-time and discrete-time signals and systems. The analysis tools such as Fourier transform, Laplace transform, sampling theorem and Z-transform are presented elaborately. Conceptual understanding is reinforced through plenty of worked examples.

The book concludes with a chapter focused on realization of Finite Impulse Response (FIR) and Infinite Impulse Response (IIR) filters. Several appendices provide the requisite background mathematical material for ease of reference by the students.


RAJESWARI & RAO
Signals and Systems, 2nd ed.
K. RAJA RAJESWARI, Principal, Viswanadha Institute of Technology and Management (VITAM), Visakhapatnam.
B. VISVESVARA RAO, Professor and Head, Department of Electronics and Communication Engineering, Mahaveer Institute of Science and Technology (MIST), Hyderabad.

The book, in its Second Edition, continues to provide a comprehensive treatment of signals and systems commencing from an elementary level and going on to a thorough analysis of mathematical tools such as Fourier transform, Laplace transform, Z-transform and discrete-time Fourier transform. The concepts of convolution and correlation and their relationship have been explained in a clear and lucid manner. Both continuous-time and discrete-time signals and systems have been covered, and thoroughly supported with adequate number of explained examples.

The book is intended for the BE/BTech students of Electrical Engineering, Electronics and Communication Engineering, Computer Science and Engineering, Information Communication Technology (ICT), Telecommunication Engineering and Biomedical Engineering.

NEW TO THIS EDITION
• A new chapter on MATLAB programming for generation of continuous-time and discrete-time series is added.
• MATLAB solutions have been given for stability testing of discrete-time systems.
• Sections on simple electronic systems realization have been added in existing Chapter 6.
• More solved examples, problems and multiple choice questions, have been added in almost every chapter to reinforce the understanding of the theory.


RAV! KUMAR
Signals and Systems
I. RAVI KUMAR, Principal, SISTAM College of Engineering, Srikakulam.

This textbook provides comprehensive coverage of the principles of signals and systems with a strong emphasis on solving problems. It is suitable for BE/B.Tech students of Electronics and Communication Engineering, Electrical and Electronics Engineering, Electronics and Instrumentation Engineering, Electronics and Control Engineering, Instrumentation and Control Engineering, Computer Science and Engineering, Information and Communication Technology, Telecommunication Engineering and Biomedical Engineering.

The book presents a thorough analysis of both continuous-time and discrete-time signals and systems. It discusses in great detail the mathematical tools such as Fourier series, Fourier transform, Laplace transform and z-transform. The book also explains signal transmission through linear systems and various filters, as well as the concepts of convolution, correlation and sampling. Through numerous worked-out examples, the book provides the students with a solid foundation for understanding this highly mathematical subject.

KEY FEATURES
• Presents clear and complete mathematical steps for analysis of the concepts.
• Lists important formulae at the end of each chapter for easy recall.
• Offers a large number of solved problems to help the students build a firm conceptual base.
• Gives review questions and objective type questions at the end of each chapter to examine students’ assimilation of the material.

Solid State State Electronics

DASGUPTA & DASGUPTA

Semiconductor Devices: Modelling and Technology

NANDITA DASGUPTA, is an Associate Professor in the Department of Electrical Engineering, IIT Madras.
AMITAVA DASGUPTA, is an Associate Professor in the Department of Electrical Engineering, IIT Madras.

Aimed primarily at the undergraduate students pursuing courses in semiconductor physics and semiconductor devices, this text emphasizes the physical understanding of the underlying principles of the subject. Since engineers use semiconductor devices as circuit elements, device models commonly used in the circuit simulators, e.g. SPICE, have been discussed in detail. Advanced topics such as lasers, heterojunction bipolar transistors, second order effects in BJTs, and MOSFETs are also covered. With such in-depth coverage and a practical approach, practising engineers and PG students can also use this book as a ready reference.

KEY FEATURES
- The chapter on Device Fabrication Technology enables easy visualization of device components and semiconductor device modelling.
- Numerous worked-out examples highlight the need for intelligent approximation to achieve more accuracy in less time.
- “HELP DESK” sections throughout the book contain questions (and their solutions) that reflect common doubts a beginner encounters.


Latest Print 2013 / 344 pp. / 17.8 × 23.5 cm
ISBN-978-81-203-2398-8 / ₹ 295.00 / (e-book also available)

NAIR & DEEPA

Solid State Devices

B. SOMANATHAN NAIR, Principal, Pankaja Kasthuri College of Engineering and Technology, Thiruvananthapuram (Kerala) and Visiting Professor, Department of Optoelectronics, University of Kerala.
S.R. DEEPA, Professor and Head, Department of Electronics and Communication Engineering, Pankaja Kasthuri College of Engineering and Technology, Thiruvananthapuram, and Visiting Professor, Department of Optoelectronics, University of Kerala.

Designed as a text for undergraduate students of engineering in Electrical, Electronics, and Computer Science and IT disciplines as well as undergraduate students (B.Sc.) of physics and electronics as also for postgraduate students of physics and electronics, this compact and accessible text endeavours to simplify the theory of solid state devices so that even an average student will be able understand the concepts with ease. The authors, Prof. Somanathan Nair and Prof. S.R. Deepa, with their rich and long experience in teaching the subject, provide a detailed discussion on such topics as crystal structures of semiconductor materials, Miller indices, energy-band theory of solids, energy level diagrams and mass action law. Besides, they give a masterly analysis of topics such as direct and indirect gap materials, Fermi-Dirac statistics, and electrons in semiconductors. Finally, they deal with Hall effect, PN junction diodes, Zener and avalanche breakdowns, Schottky-barrier diodes, bipolar junction transistors, MOS field-effect transistors, Early effect, Shockley diodes, SCR, TRIAC, and IGBTs.

DISTINGUISHING FEATURES
- Discusses the concepts in an easy-to-understand style.
- Furnishes over 300 clear-cut diagrams to illustrate the concepts discussed.
- Gives a very large number of questions—short answer, fill in the blanks, tick the correct answer and review questions—to sharpen the minds of the reader.
- Provides more than 200 fully solved numerical problems.
- Gives answers to a large number of exercises.

This fully illustrated and well-organized text should prove invaluable to students pursuing various courses in engineering and physics.


Latest Print 2010 / 392 pp. / 17.8 × 23.5 cm
ISBN-978-81-203-4106-7 / ₹ 350.00 / (e-book also available)
PATIL
Basic Electronic Devices and Circuits
MAHESH B. PATIL worked at the Central Research Lab, Hitachi (1993) and at IIT Kanpur (1994–1999), prior to joining IIT Bombay in 1999 where he is currently a Professor.

This book provides detailed fundamental treatment of the underlying physics and operational characteristics of most commonly used semiconductor devices, covering diodes and bipolar transistors, optoelectronic devices, junction field-effect transistors, and MOS transistors. In addition, basic circuits utilising diodes, bipolar transistors, and field-effect transistors are described, and examples are presented which give a good idea of typical performance parameters and the associated waveforms.

A brief history of semiconductor devices is included so that the student develops an appreciation of the major technological strides that have made today’s IC technology possible. Important concepts are brought out in a simple and lucid manner rather than simply stating them as facts. Numerical examples are included to illustrate the concepts and also to make the student aware of the typical magnitudes of physical quantities encountered in practical electronic circuits. Wherever possible, simulation results are included in order to present a realistic picture of device operation. Fundamental concepts like biasing, small-signal models, amplifier operation, and logic circuits are explained. Review questions and problems are included at the end of each chapter to help students test their understanding.

The book is designed for a first course on semiconductor devices and basic electronic circuits for the undergraduate students of electrical and electronics engineering as well as for the students of related branches such as electronics and communication, electronics and instrumentation, computer science and engineering, and information technology.重要内容


Latest Print 2013 / 608 pp. / 17.8 × 23.5 cm
ISBN-978-81-203-4471-6 / ₹ 525.00 / (e-book also available)

Statistical Signal Processing
HAYKIN, et al. (Eds.)
New Directions in Statistical Signal Processing: From Systems to Brains
Edited by: SIMON HAYKIN, JOSÉ C. PRÍNCIPE, TERRENCE J. SEJNOWSKI, and JOHN MCWHIRTER

Signal processing and neural computation have, for long, significantly but separately influenced many disciplines. New researches and the fact that highly sophisticated kinds of signal processing and elaborate computations are performed side by side in the brain, however, show that these two fields have much to teach each other as well. This book discusses the cross-fertilization of these two streams and compiles work of leading researchers from both the areas that promote interaction between both the disciplines.
This text is primarily meant for the advanced undergraduate and postgraduate students of bioinformatics and biomedical engineering. However, having evolved from two different fields, the text is also useful for the senior students of electronics and communication engineering, computer science and engineering, and electrical engineering.


Telecommunications

JAYARAM & KOTWANI
Industrial Economics and Telecommunication Regulations

R. JAYARAM, Director, Yadavrao Tasgaonkar School of Business Management, Mumbai.
NAMITA R. KOTWANI, Professor, Yadavrao Tasgaonkar School of Business Management, Mumbai.

The rapid growth in the telecommunication sector has made it essential to regulate the functioning of various modes of communication. This book provides a thorough understanding of the basic industrial economic concepts and national telecommunication policy in an easy-to-comprehend style.

Divided into five parts, comprising 21 chapters, the text introduces readers with the basic concepts of managerial economics such as elasticity of demand, market structure, price determination and money supply. The subsequent chapters are devoted to banking and taxation system, and international trade. It also gives a thorough analysis of various functions and objectives of commercial banks and distinguished features of international trade. The book elaborates on managerial concepts by explaining the nature of management, planning, communication, leadership skills and market research. Finally, the book meticulously deals with telecommunication regulations and regulatory strategies, and explains the national telecommunication policy and guidelines.

This book primarily caters to the needs of engineering students of Electronics and Telecommunication discipline for their course in Industrial Economics and Telecommunication Regulations. It will also be useful to the undergraduate students of management and commerce.

KEY FEATURES
- Includes the guidelines for Cable Television Networks (Regulation) Act
- Provides regulations of Telecom Regulatory Authority of India (TRAI)
- Incorporates chapter-end review exercises to drill students in self-study


VISWANATHAN & BHATNAGAR
Telecommunication Switching Systems and Networks, 2nd ed.

THIAGARAJAN VISWANATHAN, was Director, Indian National Scientific Documentation Centre (INSDOC) and Professor, Department of Electrical Communication Engineering, and Supercomputer Education and Research Centre, Indian Institute of Science, Bangalore.
MANAV BHATNAGAR, Associate Professor, Department of Electrical Engineering, Indian Institute of Technology Delhi.

The rapid expansion of the field of telecommunication networks call for a new edition to assist the readers with development of understanding towards new telecommunication technologies. This well-accepted textbook, now in its Second Edition, is designed for the final-year undergraduate and the first-year graduate students in electronics and communication engineering and allied subjects. It fulfils the need for a suitable textbook in the area of telecommunication switching systems and networks. The text covers, in a single volume, both switching systems and telecommunications networks.

The book begins with a brief discussion on the evolution of telecommunication. It then goes on to give a classification scheme for switching systems, and describes
the basic components of a switching system and the fundamental concepts of network structures. It provides an in-depth coverage of fibre optic communication system and the traffic engineering concepts. A distinguishing feature of the book is the thorough treatment of the most important telecommunication networks, viz. the public switched telephone network (PSTN), the public data network (PDN), and the integrated services digital network (ISDN).

Worked-out examples and exercises would be of considerable assistance to the reader in understanding all aspects of telecommunication engineering.

**NEW TO THIS EDITION**

- Sections on SONET, WDM, and DWDM in Chapter 7
- New section on Broadband ISDN and related technologies in Chapter 11
- A new chapter on Mobile Communication which covers almost all aspects of the cell planning and mobile channels
- A new chapter on Satellite Communication which gives sufficient introductory knowledge of the satellites, satellite orbits, and orbital theory
- Satellite link budget analysis (with examples) in Chapter 13.


**Latest Print 2015** / 640 pp. / 16.0 × 24.1 cm
ISBN-978-81-203-5083-0 / ₹ 395.00 / (e-book also available)

**ESHRAGHIAN, PUCKNELL & ESHRAGHIAN**

**Essentials of VLSI Circuits and Systems**

KAMRAN ESHRAGHIAN, DOUGLAS A. PUCKNELL and SHOLEH ESHRAGHIAN.

The progress made in microelectronics and photon-based sciences, coupled with the emergence of nanotechnology, is enabling development of novel VLSI circuits and systems with extraordinary new properties relevant to nearly every sector of the economy.

In this new book, the authors (the first two are senior, established authors) use their pedagogical skills and professional expertise to present the fundamentals of silicon-based VLSI design topics as the enabler of future systems. The book offers comprehensive coverage of the essential matters for the design of digital circuits in nMOS, CMOS and BiCMOS technologies. It is an accessible and well-structured textbook that provides insights into concepts and illustrates, through numerous examples, links between circuits, logic, and system design.

**KEY FEATURES**

- Design exercises and challenging CMOS design projects are included to provide hands-on experience.
- Real-world micro-based rule sets are included to provide a feel of more effective designs.
- Architectural issues related to deep submicron technologies (DST) and in-depth treatment of the recent advances are lucidly presented.
- Gives logical and established design parameters and processes.

The material covered in this book is classroom tested by the authors over a number of years. It covers essentials
of VLSI design in a style that makes for easy reading by students and prepares them to embark upon challenging design takes ahead.


**Later Print 2015 / 512 pp. / 17.8 × 23.5 cm**
ISBN-978-81-203-2772-6 / ₹ 450.00 / (e-book also available)

**PUCKNELL & ESHRAGHIAN**
**Basic VLSI Design, 3rd ed.**
DOUGLAS A. PUCKNELL and KAMRAN ESHRAGHIAN, both of the Department of Electrical and Electronic Engineering, University of Adelaide.

This thoroughly revised and updated VLSI text covers nMOS, CMOS, BiCMOS and gallium arsenide technologies in detail. It provides a direct, yet inclusive treatment of VLSI design processes and design rules for students and novice digital systems designers.

**KEY FEATURES**
- Innovative and successful design methodology based on ‘ring diagrams’ for GaAs circuits.
- Contains an expanded and improved presentation of scaling, arithmetic circuits and testability; and an in-depth treatment of technologies of the 1990s for the design of digital VLSI circuits.
- Incorporates a lucid treatment of fundamental aspects of circuits in silicon.
- Gives a logical and well-founded development of design parameters and processes.


**Latest Print 2014 / 520 pp. / 17.8 × 23.5 cm**
ISBN-978-81-203-0986-9 / ₹ 375.00

**RAJ & LATHA**
**VLSI Design**
A. ALBERT RAJ, Assistant Professor and Head, Department of Electronics and Instrumentation Engineering, Noorul Islam College of Engineering, Kanyakumari, Tamil Nadu.
T. LATHA, Assistant Professor, Department of Electronics and Instrumentation Engineering, Noorul Islam College of Engineering, Kanyakumari.

This text is intended for the undergraduate engineering students in Electrical and Electronics Engineering,

With the electronic devices and chips becoming smaller and smaller, the sizes of circuits and transistors on the microchips are approaching atomic levels. And so, Very Large-Scale Integration (VLSI) Design refers to the process of placing hundreds of thousands of electronic components on a single chip which nearly all modern computer architectures employ, and this technology has assumed a significant role in today’s tech savvy world.

This well-organized, up-to-date and compact text explains the basic concepts of MOS technology including the fabrication methods, MOS characteristic behaviour, and design processes for layouts, etc. in a crisp and easy-to-learn style. The latest and most advanced techniques for maximising performance, minimising power consumption, and achieving rapid design turnarounds are discussed with great skill by the authors.

KEY FEATURES
- Provides a large number of short answer questions to help the students during examinations.
- Explains all combinational and sequential logics separately.
- Contains a large number of solved and unsolved problems based on issues related to digital VLSI design.


Wireless Communication

NATHAN

Wireless Communications

P. MUTHU CHIDAMBARA NATHAN, Senior Lecturer with Department of Electronics and Communication Engineering, National Institute of Technology, Tiruchirappalli.

Designed as a textbook for the undergraduate students of electronics and communication engineering, electronics and electrical engineering, computer science and engineering, and information technology, this compact and well organized text presents many recent topics in the fastest growing field of communication.

Beginning with an introduction to modern wireless communication systems, this text covers the basic concepts of cellular and capacity improvement in cellular systems, propagation mechanisms in wireless communication, fading channels, diversity techniques and wireless standards such as GSM, GPRS and UMTS. It concludes with a description on wireless LAN concepts and Bluetooth technology. This book also presents various important topics such as CDMA, MIMO, OFDM, smart antennas and MC-CDMA techniques that have emerged recently.
KEY FEATURES

• Provides worked out practical problems in cellular capacity improvement and wireless propagation.
• Emphasizes the purpose of diversity and implementation issues.
• Analyzes thoroughly the diversity combining techniques with probability density functions.
• Gives step-by-step treatment on the evolution of wireless communications till 4G.
• Explains PAPR reduction in MC-CDMA.

Besides undergraduate students, this book will also be useful to the postgraduate students for the courses in wireless communication/mobile communication, researchers and practicing engineers in the field of wireless communication.


Latest Print 2013 / 236 pp. / 16.0 × 24.1 cm
ISBN-978-81-203-3514-1 / ₹ 225.00 / (e-book also available)

PALANIVELU & NAKKEERAN

Wireless and Mobile Communication

T.G. PALANIVELU, Principal of Pondicherry Engineering College.
R. NAKKEERAN, Assistant Professor in the Department of Electronics and Communication Engineering, Pondicherry Engineering College.

This text provides comprehensive coverage of the fundamental aspects of wireless technology and brings into focus the recent developments in the field. It introduces the students to the various mobile communication standards, artificial intelligence techniques for mobility management, and the methods adopted for frequency management.

The book explains the cordless mobile systems and mobile computing and elaborates the satellite techniques essential for global mobile communication and co-channel interference to manage frequency reuse hazards. It deals with important design parameters of mobile communication system and discusses the various security measures adopted to prevent the irregularities in wireless networking. Wideband code division multi-access (WCDMA), Bluetooth technology, and the intelligent mobile communication system that provides better service quality are also described. Finally, the book discusses the fourth generation mobile communication system to provide user-controlled services, inter-networking and reconfigurable technology.

The book includes a large number of solved problems to give a thorough grounding in the concepts. It also provides chapter-end exercises to test students’ understanding of the subject.

The text is designed for undergraduate students of electrical and electronics engineering, electronics and communication engineering, computer science and engineering, and information technology (IT).


Latest Print 2013 / 288 pp. / 17.8 × 23.5 cm
ISBN-978-81-203-3607-0 / ₹ 250.00 / (e-book also available)

GARG, et al.

Wave Optics

SURESH GARG, Professor of Physics at the School of Sciences, IGNOU, New Delhi.
SANJAY GUPTA, Senior Lecturer in Physics at the School of Sciences, IGNOU, New Delhi.
C.K. GHOSH, Director, National Centre for Innovations in Distance Education, IGNOU, New Delhi.

This textbook offers a complete and rigorous presentation of the fundamentals and applications of wave optics. The material of the book covers topics on wave nature of light-reflection, refraction, polarisation, diffraction, dispersion and scattering of electromagnetic waves. Interference phenomenon is discussed both by division of wavefront and by division of amplitude. Diffraction is classified as Fresnel diffraction and Fraunhofer diffraction. The discussion on Fraunhofer diffraction has been used to explain the theory and resolving power of optical instruments. The role of phenomena of dispersion and scattering of light has been lucidly explained in the field of communication of information, its quality and content. The last three chapters are devoted to the study of the recently developed modern topics—lasers, holography, and fibre optics—all of which have opened up immense opportunities for new applications in almost all branches of science and engineering.

Though the book is intended for the undergraduate students of physics—both honours and general courses—it will also be useful to candidates aspiring to sit the competitive examinations.

KEY FEATURES

• Presents interactive text interspersed with in-text questions to enable students to shift focus on active learning.
• Uses access devices such as expected learning outcomes and practice exercises for directed teaching-learning.
• Includes numerous worked-out examples to illustrate the concepts and provides review questions to test the students’ understanding of the subject.
• Gives chapter-end summary for quick revision of the important results.

Latest Print 2013 / 280 pp. / 17.8 × 23.5 cm
ISBN-978-81-203-4781-6 / ₹ 250.00 / (e-book also available)

SINGH
Fundamentals of Optics
DEVRAJ SINGH, Lecturer in the Department of Applied Physics at Amity School of Engineering and Technology, New Delhi.

Intended as a textbook for undergraduate students of physics, this book provides a sound understanding of the fundamental concepts of optics.

The book covers a wide range of interesting topics such as Fermat’s principle, geometrical and fibre optics, dispersion, interference, diffraction and polarization of light waves, optical instruments, lens aberrations and holography. It also discusses principles, types and components of lasers, electromagnetic waves, photoconductivity and photovoltaics. The topics are dealt with in a well-organized sequence with proper explanations along with simple mathematical formulations.

KEY FEATURES

• Explains the concepts through extensive use of line drawings.
• Gives derivations of essential relations in full.
• Provides several solved illustrative examples to help students comprehend the concepts with ease.
• Includes multiple choice questions and theoretical questions to help students check their understanding of the subject matter.
• Contains numerical problems with answers to build problem-solving skills.


Latest Print 2010 / 448 pp. / 17.8 × 23.5 cm
ISBN-978-81-203-4189-0 / ₹ 350.00 / (e-book also available)
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<tr>
<th>Author/Co-author(s)</th>
<th>Title</th>
<th>Edition</th>
<th>Price</th>
</tr>
</thead>
<tbody>
<tr>
<td>DASGUPTA &amp; DASGUPTA</td>
<td>Semiconductor Devices: Modelling and Technology</td>
<td></td>
<td>73</td>
</tr>
<tr>
<td>DASH &amp; KHUNTIA</td>
<td>Fundamentals of Electromagnetic Theory</td>
<td>2nd</td>
<td>34</td>
</tr>
<tr>
<td>DE &amp; DUTTA</td>
<td>Electric Machines and Electric Drives: Problems with Solutions</td>
<td></td>
<td>24</td>
</tr>
<tr>
<td>DE &amp; SEN</td>
<td>Electric Drives</td>
<td></td>
<td>21</td>
</tr>
<tr>
<td>DESAI</td>
<td>Control System Components</td>
<td></td>
<td>11</td>
</tr>
<tr>
<td>DESHPANDE</td>
<td>Design and Testing of Electrical Machines</td>
<td></td>
<td>24</td>
</tr>
<tr>
<td>DESHPANDE</td>
<td>Electric Motors: Applications and Control</td>
<td></td>
<td>22</td>
</tr>
<tr>
<td>DESHPANDE</td>
<td>Electrical Machines</td>
<td></td>
<td>25</td>
</tr>
<tr>
<td>DESHPANDE</td>
<td>Elements of Electrical Power Station Design</td>
<td></td>
<td>28</td>
</tr>
<tr>
<td>EARNEST</td>
<td>Wind Power Technology</td>
<td></td>
<td>65</td>
</tr>
<tr>
<td>EARNEST &amp; WIZELIUS</td>
<td>Wind Power Plants and Project Development</td>
<td>2nd</td>
<td>TBA</td>
</tr>
<tr>
<td>ESRAGHIAN, PUCKNELL &amp; ESRAGHIAN</td>
<td>Essentials of VLSI Circuits and Systems</td>
<td></td>
<td>76</td>
</tr>
<tr>
<td>GANGULI</td>
<td>Introduction to Electrical Engineering</td>
<td></td>
<td>49</td>
</tr>
<tr>
<td>GANGULI</td>
<td>Principles of Electronics</td>
<td>Forthcoming</td>
<td>50</td>
</tr>
<tr>
<td>GARG, et al.</td>
<td>Wave Optics</td>
<td></td>
<td>80</td>
</tr>
<tr>
<td>GEJJI</td>
<td>Analog and Mixed Mode VLSI Design</td>
<td></td>
<td>77</td>
</tr>
<tr>
<td>GHOSH</td>
<td>Fundamentals of Electrical and Electronics Engineering</td>
<td>2nd</td>
<td>50</td>
</tr>
<tr>
<td>GHOSH</td>
<td>Introduction to Control Systems</td>
<td>2nd</td>
<td>12</td>
</tr>
<tr>
<td>GHOSH</td>
<td>Introduction to Measurements and Instrumentation</td>
<td>4th</td>
<td>44</td>
</tr>
<tr>
<td>GHOSH</td>
<td>Introduction to Transducers</td>
<td></td>
<td>45</td>
</tr>
<tr>
<td>GHOSH</td>
<td>Network Theory: Analysis and Synthesis</td>
<td></td>
<td>6</td>
</tr>
<tr>
<td>GHOSH &amp; SRIDHAR</td>
<td>0000 to 8085: Introduction to Microprocessors for Engineers and Scientists, 2nd ed.</td>
<td></td>
<td>54</td>
</tr>
<tr>
<td>GUPTA</td>
<td>Optoelectronic Devices and Systems</td>
<td>2nd</td>
<td>60</td>
</tr>
<tr>
<td>GUPTA</td>
<td>Power Plant Engineering</td>
<td></td>
<td>63</td>
</tr>
<tr>
<td>GUPTA</td>
<td>Textbook on Optical Fiber Communication and Its Applications</td>
<td>2nd</td>
<td>61</td>
</tr>
<tr>
<td>GURUNG</td>
<td>Signals and Systems</td>
<td></td>
<td>71</td>
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