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Electrical Machines - I Uday A. Bakshi
2020-11-01 The importance of various electrical machines is well known in the various engineering fields. The book provides comprehensive coverage of the magnetic

circuits, magnetic materials, single and three phase transformers and d.c. machines. The book is structured to cover the key aspects of the course Electrical Machines - I. The book starts with the explanation of basics of magnetic circuits, concepts of self and mutual inductances

and important magnetic materials. Then it explains the fundamentals of single phase transformers including the construction, phasor diagram, equivalent circuit, losses, efficiency, methods of cooling, parallel operation and autotransformer. The chapter on three phase transformer provides the detailed discussion of construction, connections, phasor groups, parallel operation, tap changing transformer and three winding transformer. The various testing methods of transformers are also incorporated in the book. The book further explains the concept of electromechanical energy conversion including the discussion of singly and multiple excited systems. Then the book covers all the details of d.c. generators including construction, armature reaction, commutation, characteristics, parallel operation and applications. The book also includes the details of d.c. motors such as characteristics, types of starters, speed control methods, electric braking and permanent magnet d.c. motors. Finally, the book covers the

various testing methods of d.c. machines including Swinburne's test, brake test, retardation test and Hopkinson's test. The book uses plain, lucid language to explain each topic. The book provides the logical method of explaining the various complicated topics and stepwise methods to make the understanding easy. Each chapter is well supported with necessary illustrations, self-explanatory diagrams and variety of solved problems. All the chapters are arranged in a proper sequence that permits each topic to build upon earlier studies. The book explains the philosophy of the subject which makes the understanding of the concepts very clear and makes the subject more interesting.

DSP Integrated Circuits Lars Wanhammar
1999-02-24 DSP Integrated Circuits establishes the essential interface between theory of digital signal processing algorithms and their implementation in full-custom CMOS technology. With an emphasis on techniques for co-design of

DSP algorithms and hardware in order to achieve high performance in terms of throughput, low power consumption, and design effort, this book provides the professional engineer, researcher, and student with a firm foundation in the theoretical as well as the practical aspects of designing high performance DSP integrated circuits. Centered around three design case studies, DSP Integrated Circuits thoroughly details a high-performance FFT processor, a 2-D Discrete Cosine Transform for HDTV, and a wave digital filter for interpolation of the sampling frequency. The case studies cover the essential parts of the design process in a top-down manner, from specification of algorithm design and optimization, scheduling of operations, synthesis of optimal architectures, realization of processing elements, to the floor-planning of the integrated circuit. Details the theory and design of digital filters - particularly wave digital filters, multi-rate digital filters, fast Fourier transforms (FFT's), and discrete cosine

transforms (DCT's) Follows three complete "real-world" case studies throughout the book Provides complete coverage of finite word length effects in DSP algorithms In-depth survey of the computational properties of DSP algorithms and their mapping to optimal architectures Outlines DSP architectures and parallel, bit-serial, and distributed arithmetic Presents the design process in a top-down manner and incorporates numerous problems and solutions

Textbook of Environmental Studies for Undergraduate Courses Erach Bharucha 2005-11 The Importance Of Environmental Studies Cannot Be Disputed Since The Need For Sustainable Development Is A Key To The Future Of Mankind. Recognising This, The Honourable Supreme Court Of India Directed The Ugc To Introduce A Basic Course On Environmental Education For Undergraduate Courses In All Disciplines, To Be Implemented By Every University In The Country. Accordingly, The Ugc Constituted An Expert Committee To Formulate

A Six-Month Core Module Syllabus For Environmental Studies. This Textbook Is The Outcome Of The Ugc S Efforts And Has Been Prepared As Per The Syllabus. It Is Designed To Bring About An Awareness On A Variety Of Environmental Concerns. It Attempts To Create A Pro-Environmental Attitude And A Behavioural Pattern In Society That Is Based On Creating Sustainable Lifestyles And A New Ethic Towards Conservation. This Textbook Stresses On A Balanced View Of Issues That Affect Our Daily Lives. These Issues Are Related To The Conflict Between Existing `Development Strategies And The Need For `Conservation . It Not Only Makes The Student Better Informed On These Concerns, But Is Expected To Lead The Student Towards Positive Action To Improve The Environment. Based On A Multidisciplinary Approach That Brings About An Appreciation Of The Natural World And Human Impact On Its Integrity, This Textbook Seeks Practical Answers To Make Human Civilization Sustainable On The

Earth S Finite Resources. Attractively Priced At Rupees One Hundred And Fifteen Only, This Textbook Covers The Syllabus As Structured By The Ugc, Divided Into 8 Units And 50 Lectures. The First 7 Units, Which Cover 45 Lectures Are Classroom Teaching-Based, And Enhance Knowledge Skills And Attitude To Environment. Unit 8 Is Based On Field Activities To Be Covered In 5 Lecture Hours And Would Provide Students With First Hand Knowledge On Various Local Environmental Issues.

Biometric Systems 2021-02-10 Biometrics are used widely in various real-life applications today. There are a number of potential biometric applications that include different areas such as personal recognition, identification, verification, and others. It may be needed for safety, security, permission, banking, crime prevention, forensics, medical applications, communication, face finding, and others. This book is specifically dedicated to biometric research, applications, techniques, tools, and algorithms that originate

from different fields such as image processing, computer vision, pattern recognition, signal processing, artificial intelligence, intelligent systems, and soft computing. The main objective of this book is to provide the international community with an effective platform in the area of people identity verification and authentication from physiological and behavioral aspects. This publication provides an effective platform for helping and guiding readers, professionals, researchers, academicians, engineers, scientists, and policy makers involved in the area of biometrics.

A Textbook of Strength of Materials R. K. Bansal
2010

Principles of Digital Communication Robert G. Gallager 2008-02-28 The renowned communications theorist Robert Gallager brings his lucid writing style to the study of the fundamental system aspects of digital communication for a one-semester course for graduate students. With the clarity and insight

that have characterized his teaching and earlier textbooks, he develops a simple framework and then combines this with careful proofs to help the reader understand modern systems and simplified models in an intuitive yet precise way. A strong narrative and links between theory and practice reinforce this concise, practical presentation. The book begins with data compression for arbitrary sources. Gallager then describes how to modulate the resulting binary data for transmission over wires, cables, optical fibers, and wireless channels. Analysis and intuitive interpretations are developed for channel noise models, followed by coverage of the principles of detection, coding, and decoding. The various concepts covered are brought together in a description of wireless communication, using CDMA as a case study. System Identification and Adaptive Control Cornelius T. Leondes 1987

Handbook of Research Methodology
9781545703403 This comprehensive Handbook

is aimed at both academic researchers and practitioners in the field of research. The book's 8 chapters, provide in-depth coverage of research methods based on the revised syllabus of various universities especially considering the students of under graduate, post graduate and doctorate level. This book is a product of extensive literature survey made by the authors. The authors have made sincere efforts to write the book in simple language. The book comprises all the aspects according to new syllabus of PCI and APJ Abdul Kalam Technical University, Lucknow. Though this book is intended for the use of pharmacy students of any level yet it can also be useful to students of applied fields and medical students. The book deals with interdisciplinary fields such as finding research problems, writing research proposals, obtaining funds for research, selecting research designs, searching the literature and review, collection of data and analysis, preparation of thesis, writing research papers for journals,

citation and listing of references, preparation of visual materials, oral and poster presentation in conferences, minutes of meetings, and ethical issues in research. At the end of every chapter and book some questions related to chapter have been mentioned for the support of students to understand the subject. Valuable suggestions for the improvement of this book are most welcome. Software Testing and Quality Assurance Kshirasagar Naik 2011-09-23 A superior primer on software testing and quality assurance, from integration to execution and automation This important new work fills the pressing need for a user-friendly text that aims to provide software engineers, software quality professionals, software developers, and students with the fundamental developments in testing theory and common testing practices. Software Testing and Quality Assurance: Theory and Practice equips readers with a solid understanding of: Practices that support the production of quality software Software testing techniques Life-cycle models

for requirements, defects, test cases, and test results Process models for units, integration, system, and acceptance testing How to build test teams, including recruiting and retaining test engineers Quality Models, Capability Maturity Model, Testing Maturity Model, and Test Process Improvement Model Expertly balancing theory with practice, and complemented with an abundance of pedagogical tools, including test questions, examples, teaching suggestions, and chapter summaries, this book is a valuable, self-contained tool for professionals and an ideal introductory text for courses in software testing, quality assurance, and software engineering.

Data Structures and Algorithms in Python
Michael T. Goodrich 2013-03-08 Based on the authors' market leading data structures books in Java and C++, this textbook offers a comprehensive, definitive introduction to data structures in Python by authoritative authors. *Data Structures and Algorithms in Python* is the first authoritative object-oriented book available

for the Python data structures course. Designed to provide a comprehensive introduction to data structures and algorithms, including their design, analysis, and implementation, the text will maintain the same general structure as *Data Structures and Algorithms in Java* and *Data Structures and Algorithms in C++*.

Electronic Circuits - II R. J. Watts 1947
Adsorption Processes for Water Treatment and Purification Adrián Bonilla-Petriciolet
2017-07-03 This book provides researchers and graduate students with an overview of the latest developments in and applications of adsorption processes for water treatment and purification. In particular, it covers current topics in connection with the modeling and design of adsorption processes, and the synthesis and application of cost-effective adsorbents for the removal of relevant aquatic pollutants. The book describes recent advances and alternatives to improve the performance and efficacy of this water purification technique. In addition,

selected chapters are devoted to discussing the reliable modeling and analysis of adsorption data, which are relevant for real-life applications to industrial effluents and groundwater. Overall, the book equips readers with a general perspective of the potential that adsorption processes hold for the removal of emerging water pollutants. It can readily be adopted as part of special courses on environmental engineering, adsorption and water treatment for upper undergraduate and graduate students. Furthermore, the book offers a valuable resource for researchers in water production control, as well as for practitioners interested in applying adsorption processes to real-world problems in water treatment and related areas. Essential Physics John Matolyak 2013-12-17 Fluency with physics fundamentals and problem-solving has a collateral effect on students by enhancing their analytical reasoning skills. In a sense, physics is to intellectual pursuits what strength training is to sports. Designed for a

two-semester algebra-based course, Essential Physics provides a thorough understanding of the fundamentals of physics central to many fields. It omits material often found in much larger texts that cannot be covered in a year-long course and is not needed for non-physics majors. Instead, this text focuses on providing a solid understanding of basic physics and physical principles. While not delving into the more specialized areas of the field, the text thoroughly covers mechanics, electricity and magnetism, light, and modern physics. This book is appropriate for a course in which the goals are to give the students a grasp of introductory physics and enhance their analytical problem-solving skills. Each topic includes worked examples. Math is introduced as necessary, with some applications in biology, chemistry, and safety science also provided. If exposure to more applications, special topics, and concepts is desired, this book can be used as a problem-solving supplement to a more inclusive text.

Computer Aided and Integrated Manufacturing Systems: Computer aided design Cornelius T. Leondes 2003 This is an invaluable five-volume reference on the very broad and highly significant subject of computer aided and integrated manufacturing systems. It is a set of distinctly titled and well-harmonized volumes by leading experts on the international scene. The techniques and technologies used in computer aided and integrated manufacturing systems have produced, and will no doubt continue to produce, major annual improvements in productivity, which is defined as the goods and services produced from each hour of work. This publication deals particularly with more effective utilization of labor and capital, especially information technology systems. Together the five volumes treat comprehensively the major techniques and technologies that are involved.

FUNDAMENTALS OF HEAT AND MASS TRANSFER B. K. VENKANNA 2010-01-01 "This

comprehensive text on the basics of heat and mass transfer provides a well-balanced treatment of theory and mathematical and empirical methods used for solving a variety of engineering problems. The book helps students develop an intuitive and practical understanding of the processes by emphasizing the underlying physical phenomena involved. Focusing on the requirement to clearly explain the essential fundamentals and impart the art of problem-solving, the text is written to meet the needs of undergraduate students in mechanical engineering, production engineering, industrial engineering, auto-mobile engineering, aeronautical engineering, chemical engineering, and biotechnology.

Experimental Aerodynamics Stefano Discetti 2017-03-16 Experimental Aerodynamics provides an up to date study of this key area of aeronautical engineering. The field has undergone significant evolution with the development of 3D techniques, data processing

methods, and the conjugation of simultaneous measurements of multiple quantities. Written for undergraduate and graduate students in Aerospace Engineering, the text features chapters by leading experts, with a consistent structure, level, and pedagogical approach. Fundamentals of measurements and recent research developments are introduced, supported by numerous examples, illustrations, and problems. The text will also be of interest to those studying mechanical systems, such as wind turbines.

POWER SYSTEM ANALYSIS S. RAMAR

2013-03-25 Designed primarily as a textbook for senior undergraduate students pursuing courses in Electrical and Electronics Engineering, this book gives the basic knowledge required for power system planning, operation and control. The contents of the book are presented in simple, precise and systematic manner with lucid explanation so that the readers can easily understand the underlying principles. The book

deals with the per phase analysis of balanced three-phase system, per unit values and application including modelling of generator, transformer, transmission line and loads. It explains various methods of solving power flow equations and discusses fault analysis (balanced and unbalanced) using bus impedance matrix. It describes various concepts of power system stability and explains numerical methods such as Euler method, modified Euler method and Runge-Kutta methods to solve 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.

Tancet MCA

Microneurosurgery Mahmut Gazi Yaşargil
1987-05-14 AVM of the Brain, History,
Embryology, Pathological Considerations,
Hemodynamics, Diagnostic Studies,
Microsurgical Anatomy

Lasers in Medicine Ronald W. Waynant
2001-12-20 The use of lasers in medical practice
has dramatically increased over the years.
Lasers and modern optics have largely been
unexplored in medical science. This contributed
work is both optimistic and cautionary in its
expert evaluation of the state-of-the-art medical
use of laser technology. The use of lasers to
improve upon conventional practice is
highlighted in the foreword by the late Dr. Leon
Goldman, widely regarded as the father of laser
medicine. Focused on filling a need for a "basic
physics" understanding of laser-tissue
interactions, *Lasers in Medicine* brings together
contributions from experts in various medical
specialties, including ophthalmology,
dermatology, and cardiovascular medicine. Each

chapter addresses significant applications of
laser technology and offers the author's
perspective on the state-of-the-art within that
specialty. The discussions convey enough basic
information to enable readers to assess a laser's
usefulness for a specific purpose and to
understand its limitations: A clinical engineer
needs to know what laser to use for tattoo
removal-Chapter 1 lists laser wavelengths
available and pulse characteristics for
absorption in tattoo ink to thermally decompose
the ink, allowing the body to remove it. An
oncologist discovers cancerous tissue in the
lining of a bladder-can photodynamic therapy be
used to treat it, and what is the success rate?
Chapter 10 details treatment and Chapter 6 tells
how to find exactly where the cancer is located.
A newly graduated ophthalmologist needs to
know the advantages a laser can bring to his
profession-Chapter 8 can provide the
information he needs to know. Lasers have made
many advances in medicine-especially in

ophthalmology, dermatology, and cardiology-sparking a wave of enthusiasm. Lasers in Medicine supplies sufficient fundamental knowledge in order to more appropriately assess a laser's usefulness for a specific purpose, and to not attempt to purchase or utilize a laser when it is not the best solution.

Control Systems Engineering 2005 This book is designed for undergraduate students of all branches, and those who study Control Systems Engineering as one of the subjects in their curriculum. It is also a reference book for PG students. The contents of the book are presented in lucid style so that even an average student can grasp the subject. Many number of simple and complex problems are worked out to strengthen the theory. Most of the topics are presented in lucid manner so that the students belong to various branches like Electrical, Communication, Instrumentation and Mechanical Engineering can easily understand the subject. More than 250 worked out

examples, 120 practice problems and 150 short questions and answers are given. It covers the entire syllabus of most of the Universities in India, with particular focus to Anna University, JNTU, University of Kerala, CUSAT, MG University, BPTU, VTU, UPTU, WBTU, and University of Bombay. Methods to draw Bode plots without much analytical calculations are given. Theory and problems on Nyquist criterion made simple. Methods of compensator design (using root locus and frequency response) are presented in lucid manner. Solutions to University question papers are included in a separate annexure.

EMBEDDED SYSTEM DESIGN SANTANU CHATTOPADHYAY 2013-04-08 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

Fundamentals of Logic Design Charles H. Roth
2010 Updated with modern coverage, a
streamlined presentation, and an excellent
companion CD, this sixth edition achieves yet
again an unmatched balance between theory and
application. Authors Charles H. Roth, Jr. and
Larry L. Kinney carefully present the theory that
is necessary for understanding the fundamental
concepts of logic design while not overwhelming
students with the mathematics of switching
theory. Divided into 20 easy-to-grasp study units,
the book covers such fundamental concepts as
Boolean algebra, logic gates design, flip-flops,
and state machines. By combining flip-flops with
networks of logic gates, students will learn to
design counters, adders, sequence detectors,
and simple digital systems. After covering the
basics, this text presents modern design
techniques using programmable logic devices
and the VHDL hardware description language.

Biometric Systems Zahid Riaz 2011 Biometric

authentication has been widely used for access
control and security systems over the past few
years. The purpose of this book is to provide the
readers with life cycle of different biometric
authentication systems from their design and
development to qualification and final
application. The major systems discussed in this
book include fingerprint identification, face
recognition, iris segmentation and classification,
signature verification and other miscellaneous
systems which describe management policies of
biometrics, reliability measures, pressure based
typing and signature verification, bio-chemical
systems and behavioral characteristics. In
summary, this book provides the students and
the researchers with different approaches to
develop biometric authentication systems and at
the same time includes state-of-the-art
approaches in their design and development.
The approaches have been thoroughly tested on
standard databases and in real world
applications.

Basic Electrical and Instrumentation Engineering P. Sivaraman 2021-01-07 Electrical and instrumentation engineering is changing rapidly, and it is important for the veteran engineer in the field not only to have a valuable and reliable reference work which he or she can consult for basic concepts, but also to be up to date on any changes to basic equipment or processes that might have occurred in the field. Covering all of the basic concepts, from three-phase power supply and its various types of connection and conversion, to power equation and discussions of the protection of power system, to transformers, voltage regulation, and many other concepts, this volume is the one-stop, "go to" for all of the engineer's questions on basic electrical and instrumentation engineering. There are chapters covering the construction and working principle of the DC machine, all varieties of motors, fundamental concepts and operating principles of measuring, and instrumentation, both from a "high end"

point of view and the point of view of developing countries, emphasizing low-cost methods. A valuable reference for engineers, scientists, chemists, and students, this volume is applicable to many different fields, across many different industries, at all levels. It is a must-have for any library.

Mechanics L D Landau 1982-01-29 Devoted to the foundation of mechanics, namely classical Newtonian mechanics, the subject is based mainly on Galileo's principle of relativity and Hamilton's principle of least action. The exposition is simple and leads to the most complete direct means of solving problems in mechanics. The final sections on adiabatic invariants have been revised and augmented. In addition a short biography of L D Landau has been inserted.

Power Electronics for Renewable Energy Systems, Transportation and Industrial Applications Haitham Abu-Rub 2014-06-02 Compiles current research into the analysis and

design of power electronic converters for industrial applications and renewable energy systems, presenting modern and future applications of power electronics systems in the field of electrical vehicles. With emphasis on the importance and long-term viability of Power Electronics for Renewable Energy, this book brings together the state of the art knowledge and cutting-edge techniques in various stages of research. The topics included are not currently available for practicing professionals and aim to enable the reader to directly apply the knowledge gained to their designs. The book addresses the practical issues of current and future electric and plug-in hybrid electric vehicles (PHEVs), and focuses primarily on power electronics and motor drives based solutions for electric vehicle (EV) technologies. Propulsion system requirements and motor sizing for EVs is discussed, along with practical system sizing examples. Key EV battery technologies are explained as well as corresponding battery

management issues. PHEV power system architectures and advanced power electronics intensive charging infrastructures for EVs and PHEVs are detailed. EV/PHEV interface with renewable energy is described, with practical examples. This book explores new topics for further research needed worldwide, and defines existing challenges, concerns, and selected problems that comply with international trends, standards, and programs for electric power conversion, distribution, and sustainable energy development. It will lead to the advancement of the current state-of-the-art applications of power electronics for renewable energy, transportation, and industrial applications and will help add experience in the various industries and academia about the energy conversion technology and distributed energy sources. Combines state of the art global expertise to present the latest research on power electronics and its application in transportation, renewable energy and different

industrial applications Offers an overview of existing technology and future trends, with discussion and analysis of different types of converters and control techniques (power converters, high performance power devices, power system, high performance control system and novel applications) Systematic explanation to provide researchers with enough background and understanding to go deeper in the topics covered in the book

Aquaculture Engineering Odd-Ivar Lekang
2013-01-15 As aquaculture continues to grow at a rapid pace, understanding the engineering behind aquatic production facilities is of increasing importance for all those working in the industry. Aquaculture engineering requires knowledge of the many general aspects of engineering such as material technology, building design and construction, mechanical engineering, and environmental engineering. In this comprehensive book now in its second edition, author Odd-Ivar Lekang

introduces these principles and demonstrates how such technical knowledge can be applied to aquaculture systems. Review of the first edition: 'Fish farmers and other personnel involved in the aquaculture industry, suppliers to the fish farming business and designers and manufacturers will find this book an invaluable resource. The book will be an important addition to the shelves of all libraries in universities and research institutions where aquaculture, agriculture and environmental sciences are studied and taught.' Aquaculture Europe 'A useful book that, hopefully, will inspire successors that focus more on warm water aquaculture and on large-scale mariculture such as tuna farming.' Cision
Modern Control Theory Uday A. Bakshi
2020-11-01 The book is written for an undergraduate course on the Modern Control Systems. It provides comprehensive explanation of state variable analysis of linear control systems and analysis of nonlinear control

systems. Each chapter starts with the background of the topic. Then it gives the conceptual knowledge about the topic dividing it in various sections and subsections. Each chapter provides the detailed explanation of the topic, practical examples and variety of solved problems. The book explains the philosophy of the subject which makes the understanding of the concepts very clear and makes the subject more interesting. The book starts with explaining the concept of state variable and state model of linear control systems. Then it explains how to obtain the state models of various types of systems using phase variables, canonical variables, Jordan's canonical form and cascade programming. Then the book includes good coverage of the matrix algebra including eigen values, eigen vectors, modal matrix and diagonalization. It also includes the derivation of transfer function of the system from its state model. The book further explains the solution of state equations including the concept of state

transition matrix. It also includes the various methods of obtaining the state transition matrix such as Laplace transform method, Power series method, Cayley Hamilton method and Similarity transformation method. It further includes the detailed discussion of controllability and observability of systems. It also provides the discussion of pole placement technique of system design. The book teaches various types of nonlinearities and the nonlinear systems. The book covers the fundamental knowledge of analysis of nonlinear systems using phase plane method, isocline method and delta method. Finally, it explains stability analysis of nonlinear systems and Liapunov's stability analysis.

Fundamentals of Materials Science and Engineering: An Integrated Approach, 5th Edition William D. Callister 2016-01-11

Fundamentals of Materials Science and Engineering takes an integrated approach to the sequence of topics - one specific structure, characteristic, or property type is covered in

turn for all three basic material types: metals, ceramics, and polymeric materials. This presentation permits the early introduction of non-metals and supports the engineer's role in choosing materials based upon their characteristics. Using clear, concise terminology that is familiar to students, Fundamentals presents material at an appropriate level for both student comprehension and instructors who may not have a materials background.

Batch Processing Urmila Diwekar 2014-02-25
Although batch processing has existed for a long time, designing these processes and unit operations has been considered an onerous task that required computational efforts. Design of these processes is made more complex because of the time dependent nature of the process and the allowable flexibility. More often than not, every unit encounters optimal control problems. Therefore, traditional design books have not covered batch processing in detail. Filling this void, Batch Processing: Modeling and Design

describes various unit operations in batch and bio-processing as well as design methods for these units. Topics include: Batch distillation operating modes and configurations Batch absorption operations based on the solubility difference Batch adsorption based on differential affinity of various soluble molecules to solid absorbents Batch chromatography for measuring a wide variety of thermodynamic, kinetic, and physico-chemical properties Batch crystallization where a phase is used to find the supersaturation at which point material crystallizes Batch drying that stresses the phase diagram of water to describe this operation Batch filtration using a porous medium or screen to separate solids from liquids Batch centrifugation where centrifugal force is used for separation Batch processes are widely used in pharmaceutical, food, and specialty chemicals where high value, low volume products are manufactured. Recent developments in bio-based manufacturing also favor batch processes

because feed variations can be easily handled in batch processes. Further, the emerging area of nanomaterials manufacturing currently uses batch processes as they are low volume, high energy intensive processes. With examples, case studies, and more than 100 homework problems, this book describes the unit operations in batch and bioprocessing and gives students a thorough grounding in the numerical methods necessary to solve these design problems.

Machine Elements Boris M. Klebanov

2007-09-14 Focusing on how a machine "feels" and behaves while operating, *Machine Elements: Life and Design* seeks to impart both intellectual and emotional comprehension regarding the "life" of a machine. It presents a detailed description of how machines elements function, seeking to form a sympathetic attitude toward the machine and to ensure its wellbeing through more careful and proper design. The book is divided into three sections for accessibility and ease of comprehension. The first section is

devoted to microscopic deformations and displacements both in permanent connections and within the bodies of stressed parts. Topics include relative movements in interference fit connections and bolted joints, visual demonstrations and clarifications of the phenomenon of stress concentration, and increasing the load capacity of parts using prior elasto-plastic deformation and surface plastic deformation. The second part examines machine elements and units. Topics include load capacity calculations of interference fit connections under bending, new considerations about the role of the interference fit in key joints, a detailed examination of bolts loaded by eccentrically applied tension forces, resistance of cylindrical roller bearings to axial displacement under load, and a new approach to the choice of fits for rolling contact bearings. The third section addresses strength calculations and life prediction of machine parts. It includes information on the phenomena of

static strength and fatigue; correlation between calculated and real strength and safety factors; and error migration.

Visual Languages and Applications Tadeo Ichikawa 2011-09-26 The interface between the user of a computer-based information system and the system itself has been evolving at a rapid rate. The use of a video screen, with its color and graphics capabilities, has been one factor in this evolution. The development of light pens, mice, and other screen image manipulation devices has been another. With these capabilities has come a natural desire to find more effective ways to make use of them. In particular, much work has gone into the development of interface systems that add visual elements such as icons and graphics to text. The desire to use these visual elements effectively in communication between the user and the system has resulted in a healthy competition of ideas and discussion of the principles governing the development and use of such elements. The

present volume chronicles some of the more significant ideas that have recently been presented. The first volume in this series on the subject [Visual Languages (Chang, Ichikawa, and Ligomenides, eds.), Plenum, 1986] covered work done in the early days of the field of visual languages. Here we represent ideas that have grown out of that early work, arranged in six sections: Theory, Design Systems, Visual Programming, Algorithm Animation, Simulation Animation, and Applications. I THEORY Fundamental to the concept of visual languages is the convlctION that diagrams and other visual representations can aid understanding and communication of ideas. We begin this volume with a chapter by Fanya S.

Introduction to Physical Metallurgy Sidney Avner 1990-06-01

Control System Engineering Uday A. Bakshi 2020-11-01 The book is written for an undergraduate course on the Feedback Control Systems. It provides comprehensive explanation

of theory and practice of control system engineering. It elaborates various aspects of time domain and frequency domain analysis and design of control systems. Each chapter starts with the background of the topic. Then it gives the conceptual knowledge about the topic dividing it in various sections and subsections. Each chapter provides the detailed explanation of the topic, practical examples and variety of solved problems. The explanations are given using very simple and lucid language. All the chapters are arranged in a specific sequence which helps to build the understanding of the subject in a logical fashion. The book starts with explaining the various types of control systems. Then it explains how to obtain the mathematical models of various types of systems such as electrical, mechanical, thermal and liquid level systems. Then the book includes good coverage of the block diagram and signal flow graph methods of representing the various systems and the reduction methods to obtain simple system

from the analysis point of view. The book further illustrates the steady state and transient analysis of control systems. The book covers the fundamental knowledge of controllers used in practice to optimize the performance of the systems. The book emphasizes the detailed analysis of second order systems as these systems are common in practice and higher order systems can be approximated as second order systems. The book teaches the concept of stability and time domain stability analysis using Routh-Hurwitz method and root locus method. It further explains the fundamentals of frequency domain analysis of the systems including correlation between time domain and frequency domain. The book gives very simple techniques for stability analysis of the systems in the frequency domain, using Bode plot, Polar plot and Nyquist plot methods. It also explores the concepts of compensation and design of the control systems in time domain and frequency domain. The classical approach loses the

importance of initial conditions in the systems. Thus, the book provides the detailed explanation of modern approach of analysis which is the state variable analysis of the systems including methods of finding the state transition matrix, solution of state equation and the concepts of controllability and observability. The variety of solved examples is the feature of this book which helps to inculcate the knowledge of the design and analysis of the control systems in the students. The book explains the philosophy of the subject which makes the understanding of the concepts very clear and makes the subject more interesting.

Measurements and Instrumentation Uday A. Bakshi 2020-11-01 The importance of measuring instruments is well known in the various engineering fields. The book provides comprehensive coverage of various analog, electronic and digital instruments, d.c. and a.c. bridges, signal generators and analyzers, virtual instrumentation and data acquisition system.

The book starts with explaining the theory of measurement including characteristics of instruments, classification, standards, statistical analysis and limiting errors. Then the book explains the various analog and electronic instruments such as PMMC, moving iron, electro-dynamometer type, true RMS, Q-meter and sampling voltmeter. The book also includes the discussion of various d.c. and a.c. bridges along with necessary derivations and phasor diagrams. The book incorporates the detailed discussion of various types of oscilloscopes including simple, dual beam, dual trace, analog storage, sampling and digital oscilloscope. It also explains the various oscilloscope measurements and Lissajous figures. The book further explains the various signal generators and analyzers. It also covers the discussion of DAC, ADC, various digital instruments and data acquisition system. Finally the book provides the details of computer controlled systems, virtual instrumentation and fiber optic measurements.

Each chapter starts with the background of the topic. Then it gives the conceptual knowledge about the topic dividing it in various sections and subsections. Each chapter provides the detailed explanation of the topic, practical examples and variety of solved problems. The book explains the philosophy of the subject which makes the understanding of the concepts very clear and makes the subject more interesting.

Semiconductor Physics and Devices Donald A. Neamen 2003 This text aims to provide the fundamentals necessary to understand semiconductor device characteristics, operations and limitations. Quantum mechanics and quantum theory are explored, and this background helps give students a deeper understanding of the essentials of physics and semiconductors.

Advanced Digital Signal Processing Jian Wang 2018-06 Signal processing applications frequently encounter multi-dimensional real-time

performance requirements and restrictions on resources, which makes software implementation complex. Although major advances have been made in embedded processor technology for this application domain particularly, in technology for programmable digital signal processors - traditional compiler techniques applied to such platforms do not generate machine code of desired quality. Consequently, low-level, human-driven fine-tuning of software implementations is needed, and we are therefore in need of more effective strategies for software implementation for signal processing applications. In this book, a number of important memory and performance optimization problems are addressed for translating high-level representations of signal processing applications into embedded software implementations. This book covers selected topics in advanced digital signal processing (DSP), including theories and applications, containing contributions by a large number of

experts around the world. It is intended to provide highlights of the current trends in the digital signal processing area, showing the recent advances in this field. The covered chapters present practical advances and recent applications of digital signal processing in several areas as communications, filtering, medicine, astronomy, and image processing. This book will fulfill the need of students and researchers in the digital signal processing and related areas as well as appeal to anyone with a scientific background desiring to have knowledgeable overview of this field.

VLSI Design Esteban Tlelo-Cuautle 2012-01-20

This book provides some recent advances in design nanometer VLSI chips. The selected topics try to present some open problems and challenges with important topics ranging from design tools, new post-silicon devices, GPU-based parallel computing, emerging 3D integration, and antenna design. The book consists of two parts, with chapters such as:

VLSI design for multi-sensor smart systems on a chip, Three-dimensional integrated circuits design for thousand-core processors, Parallel symbolic analysis of large analog circuits on GPU platforms, Algorithms for CAD tools VLSI design, A multilevel memetic algorithm for large SAT-encoded problems, etc.

VIRTUAL INSTRUMENTATION USING

LABVIEW JOVITHA JEROME 2010-03-29

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.