

## Basic Electrical Engineering By Abhijit Chakraborty

The understanding of fundamental concepts of electrical engineering is necessary before moving on to more advanced concepts. This book is designed as a textbook for an introductory course in electrical engineering for undergraduate students from all branches of engineering. The text is organized into fourteen chapters, and provides a balance between theory and applications. Numerous circuit diagrams and explicit illustrations add to the readability of the text. The authors have covered some important topics such as electromagnetic field theory, electrostatics, electrical circuits, magnetostatics, network theorems, three-phase systems and electrical machines. A separate chapter on measurement and instrumentation covers important topics including errors in measurement, electro-mechanical indicating instruments, current transformers and potential transformers in detail. Pedagogical features are interspersed throughout the book for better understanding of concepts.

This book is designed to help the first-year engineering students in building their concepts in the course of Basic Electrical Engineering, It introduces the subject in a simple and lucid manner for a better understanding. It adopts a student friendly approach with many solved examples and unsolved questions. This book will serve as a stepping stone for students in understanding the course efficiently. It provides complete coverage of MAKAUT 2018 syllabu. Electrical Machines is a fundamental treatise on this very interesting subject area, where the mysteries of the internal machinery and operations of electrical motors and generators are decoded through numerous illustrative examples of descriptive, analytical and mathematical types. Focus has been placed on constructional details of machines and application areas have been mentioned throughout the text. The book also covers an interesting section on Special Machines. Thus, the book will serve as an excellent guide for summative and practical examinations for the students who have undertaken an undergraduate course on electric machines Salient Features: ? Focus on constructional details of machines ? Thorough coverage of special machines ? Application based approach to prepare for a course on Drives ?

The book presents a collection of peer-reviewed articles from the International Conference on Innovations in Cyber Physical Systems (ICICPS 2020). The conference provided opportunities for the presentation of new research results and discussion about them. It was also an opportunity to generation of new ideas in all CPS aspects, including theory, tools, applications, systems, test-beds and field deployments. The range of topics explored is wide, and covers security, control, optimization, machine learning, game theory, mechanism design, mobile and cloud computing, model-based design, verification, data mining/analytics, signal processing, and human-in-the-loop shared or supervisory control. This book will be useful to researchers, students, industrialist, developers, and practitioners alike.

Tailor-made for students of West Bengal University of Technology taking the second semester paper on Basic Electrical and Electronics Engineering - II. The content has been aligned exactly as per the new syllabus of WBUT with a new chapter inclusion in the Electronics part. Salient Feature: ëChapter Organization and coverage precisely as per new WBUT syllabus ëStepwise explanation of theories and derivations along with relevant examples ëSingle book containing the fundamentals of both electrical and electronics engineering

Learn the hand-crafted notes on C programming Key Features Strengthens the foundations, as a detailed explanation of programming language concepts are given Lucid explanation of the concept Well thought-out, fully working programming examples End-of-chapter exercises that would help you practice the skills learned in the chapter Hand-crafted "KanNotes" at the end of the each chapter that would help the reader remember and revise the concepts covered in the chapter Focuses on how to think logically to solve a problem Description The new edition of this classic book has been thoroughly revamped, but remains faithful to the principles that have

established it as a favourite amongst students, teachers and software professionals round the world. "Simplicity"- that has been the hallmark of this book in not only its previous sixteen English editions, but also in the Hindi, Gujrati, Japanese, Korean, Chinese and US editions. This book doesn't assume any programming background. It begins with the basics and steadily builds the pace so that the reader finds it easy to handle advanced topics towards the end of the book. What will you learn C Instructions Decision Control Instruction, Loop Control Instruction, Case Control Instruction Functions, Pointers, Recursion Data Types, The C Preprocessor Arrays, Strings Structures, Console Input/Output, File Input/Output Who this book is for Students, Programmers, researchers, and software developers who wish to learn the basics of C++ programming language.

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Electricity Pricing: Regulated, Deregulated and Smart Grid Systems presents proven methods for supplying uninterrupted, high-quality electrical power at a reasonable price to the consumer. Illustrating the evolution of the power market from a monopoly to an open access system, this essential text: Covers voltage stability analysis of longitudinal power supply systems using an artificial neural network (ANN) Explains how to improve performance using flexible alternating current transmission systems (FACTS) and high-voltage direct current (HVDC) Takes into account operating constraints as well as generation cost, line overload, and congestion for expected and inadvertent loading stress Goes beyond FACTS and HVDC to provide multi-objective optimization algorithms for the deregulated power market Proposes the use of stochastic optimization techniques in the smart grid, preparing the reader for future development Electricity Pricing: Regulated, Deregulated and Smart Grid Systems offers practical solutions for improving stability, reliability, and efficiency in real-time systems while optimizing electricity cost.

Cooperative Control of Multi-Agent Systems extends optimal control and adaptive control design methods to multi-agent systems on communication graphs. It develops Riccati design techniques for general linear dynamics for cooperative state feedback design, cooperative observer design, and cooperative dynamic output feedback design. Both continuous-time and discrete-time dynamical multi-

agent systems are treated. Optimal cooperative control is introduced and neural adaptive design techniques for multi-agent nonlinear systems with unknown dynamics, which are rarely treated in literature are developed. Results spanning systems with first-, second- and on up to general high-order nonlinear dynamics are presented. Each control methodology proposed is developed by rigorous proofs. All algorithms are justified by simulation examples. The text is self-contained and will serve as an excellent comprehensive source of information for researchers and graduate students working with multi-agent systems.

The subject of power systems has assumed considerable importance in recent years and growing demand for a compact work has resulted in this book. A new chapter has been added on Neutral Grounding.

An advanced textbook covering the fundamental theory of RF power amplifiers and their uses, this book provides essential guidance for design procedures. The introduction explains the basic theory of RF power amplifiers besides providing the basic classification of the different types of RF power amplifier. It then systematically dedicates a chapter to each different of RF power amplifier covering A, B and C, D (full-bridge and half-bridge types), E (zero-voltage-switching and zero-current-switching), F and DE amplifiers. Throughout this comprehensive guide, the optimal operating conditions are explored and the possible causes for suboptimum operation explained. The book then considers integrated inductors and linearization techniques and LC Oscillators in the concluding chapters. A comprehensive text covering the fundamentals of RF power amplifiers and their range of applications in radio and TV broadcasting, wireless communications and radars. Presents accessible coverage of the complex principles of operation of RF power amplifiers and radio power systems. Introduces the fundamental design techniques and procedures for practitioners for RF power amplifiers. All chapters contain examples and design procedures throughout, with review questions and problems at the end of each chapter. A solutions manual is available for instructors upon enquiry

This book presents a collection of peer-reviewed articles from the 7th International Conference on Microelectronics, Circuits, and Systems Micro 2020. The volume covers the latest development and emerging research topics of material sciences, devices, microelectronics, circuits, nanotechnology, system design and testing, simulation, sensors, photovoltaics, optoelectronics, and its different applications. This book also deals with several tools and techniques to match the theme of the conference. It will be a valuable resource for researchers, professionals, Ph.D. scholars, undergraduate and postgraduate students working in Electronics, Microelectronics, Electrical, and Computer Engineering.

Power System Operation and Control is comprehensively designed for undergraduate and postgraduate courses in electrical engineering. This book aims to meet the requirements of electrical engineering students and is useful for practicing engineers.

The present-day power grid is basically a complex power transmission network

with risks of failure due to unplanned attacks and contingencies, and therefore, assessment of vulnerability of transmission network is important and the process is based on contingency approach. This book deals with the methods of assessment of the grid network vulnerability and addresses the grid collapse problem due to cascaded failures of the transmission network following an attack or an unplanned contingency. Basic mitigation aspects for the network has been explored and the immunity of such a power transmission network against vulnerable collapse has been described using mathematical models.

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.

This book gathers high-quality papers presented at the 2nd International Conference on Communication, Devices & Computing (ICCDC 2019), held at Haldia Institute of Technology from March 14–15, 2019. The papers are divided into three main areas: communication technologies, electronics circuits & devices and computing. Written by students and researchers from around the world, they accurately reflect the global status quo.

Attuned to the needs of undergraduate students of engineering in their first year, Basic Electrical Engineering enables them to build a strong foundation in the subject. A large number of real-world examples illustrate the applications of complex theories. The book comprehensively covers all the areas taught in a one-semester course and serves as an ideal study material on the subject.

Logic synthesis enables VLSI designers to rapidly lay out the millions of transistors and interconnecting wires that form the circuitry on modern chips, without having to plot each individual logic circuit.

This book deals with the fundamentals of electrical engineering concepts like design & application of circuitry, equipment for power generation & distribution and machine control. Features Transformers discussed in detail. Thoroughly revised chapters on Single and Three-Phases Induction Motors. New chapter on: 1. Three-Phase Alternator 2. Electromechanical Energy Conversion 3. Testing of DC Machines

Basic Electrical Engineering Tata McGraw-Hill Education Basic Electrical Engineering McGraw-Hill Education

This book discusses key issues in the planning and operation of large-scale integrated energy systems (LSIES). It establishes individual-based models for LSIES and develops multi-

objective optimization algorithms and multi-attribute decision making support systems, which are applied to the planning and optimal operation of LSIES. It is a valuable reference work for researchers, students and engineers who are interested in energy systems, operation research and decision theory.

This book presents best selected papers presented at the International Conference on Emerging Trends and Technologies on Intelligent Systems (ETTIS 2021) held from 4 – 5 March 2021 in online mode at C-DAC, Noida, India. The book includes current research works in the areas of artificial intelligence, big data, cyber-physical systems, and security in industrial/real-world settings. The book illustrates on-going research results, projects, surveying works, and industrial experiences that describe significant advances in all of the related areas.

‘CONCEPTS OF ELECTRICAL AND ELECTRONICS ENGINEERING’ is intended to be used as a text book for I Semester Diploma in Computer Science and Engineering. This book is designed for comprehensively covering all topics relevant to the subject. Each and every topic has been explained in a very simple language as per the syllabus prescribed by the Board of Technical Education, Karnataka. This book is divided into ten chapters: Chapter 1 - Electric Current and DC Circuits Chapter 2 - Electrostatics Chapter 3 - Electromagnetic Induction Chapter 4 - AC Fundamentals Chapter 5 - Transformers Chapter 6 - Protection of Electric and Electronic Circuits Chapter 7 - Motors Chapter 8 - Electronic Components Chapter 9 - Basics of Electronics Chapter 10 - Op-amp The text provides detailed explanations and uses numerous easy-to-follow examples accompanied by diagrams and step-by-step solutions. Illustrative problems are presented in terms of commonly used voltages and current ratings. To enhance the utility of the book, important points and review questions (objective and descriptive type) have been included at the end of each chapter. Model question papers have been provided to help students prepare better for the semester examinations. It is hoped that the book will be of immense use to teachers and students of Polytechnics. Suggestions for improvement in the future editions of this book will be appreciated. I wish to express my gratitude to MEI Polytechnic, Bangalore for providing me an opportunity to bring out this text book. I am grateful to Sri. Nitin S. Shah, M/s Sapna Book House, Bangalore for publishing this book. I am thankful to M/s Datalink, Bangalore for meticulous processing of the manuscript of this book.

In the present edition, authors have made sincere efforts to make the book up-to-date. A notable feature is the inclusion of two chapters on Power System. It is hoped that this edition will serve the readers in a more useful way.

This volume covers principles and applications of electrical engineering, with the help of several pedagogical features.

Simulation-Based Optimization: Parametric Optimization Techniques and Reinforcement Learning introduce the evolving area of static and dynamic simulation-based optimization. Covered in detail are model-free optimization techniques – especially designed for those discrete-event, stochastic systems which can be simulated but whose analytical models are difficult to find in closed mathematical forms. Key features of this revised and improved Second Edition include: · Extensive coverage, via step-by-step recipes, of powerful new algorithms for static simulation optimization, including simultaneous perturbation, backtracking adaptive search and nested partitions, in addition to traditional methods, such as response surfaces, Nelder-Mead search and meta-heuristics (simulated annealing, tabu search, and genetic algorithms) · Detailed coverage of the Bellman equation framework for Markov Decision Processes (MDPs), along with dynamic programming (value and policy iteration) for discounted, average, and total reward performance metrics · An in-depth consideration of dynamic simulation optimization via temporal differences and Reinforcement Learning: Q-Learning, SARSA, and R-SMART algorithms, and policy search, via API, Q-P-Learning, actor-

critics, and learning automata · A special examination of neural-network-based function approximation for Reinforcement Learning, semi-Markov decision processes (SMDPs), finite-horizon problems, two time scales, case studies for industrial tasks, computer codes (placed online) and convergence proofs, via Banach fixed point theory and Ordinary Differential Equations Themed around three areas in separate sets of chapters – Static Simulation Optimization, Reinforcement Learning and Convergence Analysis – this book is written for researchers and students in the fields of engineering (industrial, systems, electrical and computer), operations research, computer science and applied mathematics.

The revision of this extremely popular text, *Circuits and Networks: Analysis and Synthesis*, comes at a time when the industry is increasingly looking to hire engineers who are able to display learning outcomes. The book has been revised based on internationally accepted Learning Outcomes required from a course. Additionally, key pedagogical aids, such as questions from previous year question papers are added afresh to further help students in preparing for this course and its examinations. For the tech savvy, the practice of MCQs in a digital and randomized environment will provide thrill. Salient Features: - Content revised as per internationally accepted learning outcomes - 461 Frequently asked questions derived from important previous year question papers - Features like Definition and Important Formulas are highlighted within the text

The need to more efficiently harvest energy for electronics has spurred investigation into materials that can harvest energy from locally abundant sources. *Ferroelectric Materials for Energy Harvesting and Storage* is the first book to bring together fundamental mechanisms for harvesting various abundant energy sources using ferroelectric and piezoelectric materials. The authors discuss strategies of designing materials for efficiently harvesting energy sources like solar, wind, wave, temperature fluctuations, mechanical vibrations, biomechanical motion, and stray magnetic fields. In addition, concepts of the high density energy storage using ferroelectric materials is explored. *Ferroelectric Materials for Energy Harvesting and Storage* is appropriate for those working in materials science and engineering, physics, chemistry and electrical engineering disciplines. Reviews wide range of energy harvesting including solar, wind, biomechanical and more Discusses ferroelectric materials and their application to high energy density capacitors Includes review of fundamental mechanisms of energy harvesting and energy solutions, their design and current applications, and future trends and challenges The revised and extended papers collected in this volume represent the cutting-edge of research at the nexus of electrical engineering and intelligent systems. They were selected from well over 1000 papers submitted to the high-profile international World Congress on Engineering held in London in July 2011. The chapters cover material across the full spectrum of work in the field, including computational intelligence, control engineering, network management, and wireless networks. Readers will also find substantive papers on signal processing, Internet computing, high performance computing, and industrial applications. The Electrical Engineering and Intelligent Systems conference, as part of the 2011 World Congress on Engineering was organized under the auspices of the non-profit International Association of Engineers (IAENG). With more than 30 nations represented on the conference committees alone, the Congress features the best and brightest scientific minds from a multitude of disciplines related to engineering. These peer-reviewed papers demonstrate the huge strides currently being taken in this rapidly developing field and reflect the excitement of those at the frontiers of this research.

This textbook “Basic Electrical Engineering” is based on the latest syllabus of the Universities, AICTE and Educational Institutes. In this edition, some material of the book has been rewritten to make the presentation easily comprehensible. More illustrative examples mainly from IAS, IES and GATE and other competitive examinations have been added. Various problems with answers have been added to

support the text. For quick revision, summary/highlights are given at the end of each chapter. Salient Features: · DC Circuits · AC Circuits · Transformers · Electrical Machines · Power converters · Electrical Installations

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.

Although they are some of the main components in the design of power electronic converters, the design of inductors and transformers is often still a trial-and-error process due to a long working-in time for these components. Inductors and Transformers for Power Electronics takes the guesswork out of the design and testing of these systems and provides a broad overview of all aspects of design. Inductors and Transformers for Power Electronics uses classical methods and numerical tools such as the finite element method to provide an overview of the basics and technological aspects of design. The authors present a fast approximation method useful in the early design as well as a more detailed analysis. They address design aspects such as the magnetic core and winding, eddy currents, insulation, thermal design, parasitic effects, and measurements. The text contains suggestions for improving designs in specific cases, models of thermal behavior with various levels of complexity, and several loss and thermal measurement techniques. This book offers in a single reference a concise representation of the large body of literature on the subject and supplies tools that designers desperately need to improve the accuracy and performance of their designs by eliminating trial-and-error.

This comprehensive book is designed both for postgraduate students in power systems/energy systems engineering and a one-year course for senior undergraduate students of electrical engineering pursuing courses on power systems. The text gives a systematic exposition of topics such as modelling of power system components, load flow, automatic load frequency control, economic operation, voltage control and stability, study of faulted power systems, and optimal power flow. Besides giving a detailed discussion on the basic principles and practices, the text provides computer-based examples to illustrate the topics discussed. What makes the text unique is that it deals with the practice of computer for power system operation and control. This book also brings together the diverse aspects of power system operation and control and is a practical hands-on guide to theoretical developments and to the application of advanced methods in solving operational and control problems of electric power systems. The book should therefore be of immense benefit to the industry professionals and researchers as well.

Power System Small Signal Stability Analysis and Control, Second Edition analyzes severe outages due to the sustained growth of small signal oscillations in modern interconnected power systems. This fully revised edition addresses the continued expansion of power systems and the rapid upgrade to smart grid technologies that call for the implementation of robust and optimal controls. With a new chapter on MATLAB programs, this book describes how the application of power system damping controllers such as Power System Stabilizers and Flexible Alternating Current Transmission System controllers—namely Static Var Compensator and Thyristor Controlled Series Compensator—can guard against system disruptions. Detailed mathematical derivations, illustrated case studies, the application of soft computation techniques, designs of robust controllers, and end-of-chapter exercises make it a useful resource to researchers, practicing engineers, and post-graduates in electrical engineering. Considers power system small signal stability and provides various techniques to mitigate it Offers a new and straightforward method of finding the optimal location of PSS in a multi-machine power system Includes MATLAB programs and simulations for practical applications

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