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86B - CHERRY ALESSANDRA

Divided into four parts: circuits, electronics, digital systems, and electromagnetics, this text provides an understanding of the fundamental principles on which modern electrical engineering is based. It is suitable for a variety of electrical engineering courses, and can also be used as a text for an introduction to electrical engineering.

Fundamentals of Electrical Engineering represents an effort to make the principles of electrical and computer engineering accessible to students in various engineering disciplines. The principal objective of the book is to present the fundamentals of electrical, electronic, and electromechanical engineering to an audience of engineering majors enrolled in introductory and more advanced or specialized electrical engineering courses. A second objective is to present these fundamentals with a focus on important results and common yet effective analytical and computational tools to solve practical problems. Finally, a third objective of the book is to illustrate, by way of concrete, fully worked examples, a number of relevant applications of electrical engineering. These examples are drawn from the authors' industrial research experience and from ideas contributed by practicing engineers and industrial partners.

Fundamentals of Electrical Engineering is an excellent introduction into the areas of electricity, electronic devices and electrochemistry. The book covers aspects of electrical science including Ohm and Kirchoff's laws, P-N junctions, semiconductors, circuit diagrams, magnetic fields, electrochemistry, and devices such as DC motors. This text is useful for students of electrical, chemical, materials, and mechanical engineering.

This book presents the basics of electrical engineering from the perspective of the primary principles behind the subject, rather than dwelling on superficial details. It is based on three objectives: to explain the fundamental ideas behind electrical engineering, to emphasize the unity of the subject, and to bring an understanding of the subject within the reach of all engineers. FEATURES: NEW--offers new material on induction motor nameplate interpretation, power distribution systems, synchronous generators, and RLC circuit analysis in time domain. provides more than 1,000 problems, many revised from the first edition. presents clear explanations of the fundamentals of electrical engineering, focusing on the basics of the subject. maintains a strong emphasis on vocabulary throughout the book. draws relevant examples directly from the daily life of the reader. provides many pedagogical aids, including icons to identify recurring ideas, "what if?" problems appended to examples, objectives at the beginning of each chapter, chapter summaries, and causality diagrams.

This book, Amplifiers: Analysis and Design, is the second of four books of a larger work, Fundamentals of Electronics. It is comprised of four chapters that describe the fundamentals of amplifier performance. Beginning with a review of two-port analysis, the first chapter introduces the modeling of the response of transistors to AC signals. Basic one-transistor amplifiers are extensively discussed. The next chapter expands the discussion to multiple transistor amplifiers. The coverage of simple amplifiers is concluded with a chapter that examines power amplifiers. This discussion defines the limits of small-signal analysis and explores the realm where these simplifying assumptions are no longer valid and distortion becomes present. The final chapter concludes the book with the first of two chapters in Fundamentals of Electronics on the significant topic of feedback amplifiers. Fundamentals of Electronics has been designed primarily for use in an upper division course in electronics for electrical engineering students. Typically such a course spans a full academic year consisting of two semesters or three quarters. As such, Amplifiers: Analysis and Design, and two other books, Electronic Devices and Circuit Applications, and Active Filters and Amplifier Frequency Response, form an appropriate body of material for such a course. Secondary applications include the use with Electronic Devices and Circuit Applications in a one-semester electronics course for engineers or as a reference for practicing engineers.

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 basics of electrical engineering, the text moves on to explain the fundamentals of circuit theory, electrostatic 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 fulfil 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

Intended for use in the introductory circuit analysis or circuit theory course taught in electrical engineering or electrical engineering technology departments.

For close to 30 years, "Basic Electrical Engineering" has been the go-to text for students of Electrical Engineering. Emphasis on concepts and clear mathematical derivations, simple language coupled with systematic development of the subject aided by illustrations makes this text a fundamental read on the subject. Divided into 17 chapters, the book covers all the major topics such as DC Circuits, Units of Work, Power and Energy, Magnetic Circuits, fundamentals of AC Circuits and Electrical Instruments and Electrical Measurements in a straightforward manner for students to understand.

Electric power engineering has always been an integral part of electrical engineering education. Providing a unique alternative to existing books on the market, this text presents a concise and rigorous exposition of the main fundamentals of electric power engineering. Contained in a single volume, the materials can be used to teach three separate courses — electrical machines, power systems and power electronics, which are in the mainstream of the electrical engineering curriculum of most

universities worldwide. The book also highlights an in-depth review of electric and magnetic circuit theory with emphasis on the topics which are most relevant to electric power engineering. Contents: Review of Electric and Magnetic Circuit Theory: Basic Electric Circuit Theory: Analysis of Electric Circuits with Periodic Non-sinusoidal Sources: Magnetic Circuit Theory: Power Systems: Introduction to Power Systems: Fault Analysis: Transformers: Synchronous Generators: Power Flow Analysis and Stability of Power Systems: Induction Machines: Power Electronics: Power Semiconductor Devices: Rectifiers: Inverters: DC-to-DC Converters (Choppers) Keywords: Power Systems; Electrical Machines; Power Electronics

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.

"Fundamentals of Electrical Engineering and Electronics" is a useful book for undergraduate students of electrical engineering and electronics as well as B.Sc. Electronics. The book discusses concepts such as Network Analysis, Capacitance, Electromagnetic Induction, Motors Circuits and Diodes in an easy to relate and thereby understand manner. Designed in accordance with the syllabi of most major universities, the book is an essential resource for anyone aspiring to learn the fundamentals and teaches students much about the subject itself. A book which has seen, foreseen and incorporated changes in the subject for more than 50 years, it continues to be one of the most sought after texts by the students.

Rizzoni's Fundamentals of Electrical Engineering provides a solid overview of the electrical engineering discipline that is especially geared toward the many non-electrical engineering students who take this course. The book was developed to fit the growing trend of the Intro to EE course morphing into a briefer, less comprehensive course. The hallmark feature of this text is its liberal use of practical applications to illustrate important principles. The applications come from every field of engineering and feature exciting technologies. The appeal to non-engineering students are the special features such as Focus on Methodology sections and Make the Connections sidebars.

Are you looking for a simple and understandable introduction to the basics of electrical engineering and electronics? Then you are well advised with this book! As an engineer (M.Eng.) I would like to teach you the basics of electrical engineering and electronics. In summary, this book offers you an easy to understand, intuitively structured and practical introduction to the world of electrical engineering! What is current and what is voltage? What is charge? What is power, what is 1 kWh? How does an electric motor work? What is the difference between direct current and alternating current? This electrical engineering handbook not only answers these questions, but also covers many other topics in depth and detail. In addition, in this compact beginner's guide, you will quickly and easily learn the functions as well as the application of important electronic components such as resistors, diodes, transistors, capacitors and much more. This book offers you a comprehensive yet compact introduction to the basics of electrical engineering and electronics! In addition to important basic terms and principles, you will also learn, for example, how to analyze circuits (Kirchhoff's rules), what a bipolar transistor is, what a MOSFET is, and how a RLC circuit is designed. We will also look at what happens when you place an inductor in a magnetic field and what practical applications these basic principles have in our modern world. We will also do some calculations together and we will learn the mathematical equations behind the basic principles of electrical engineering in each chapter. However, depending on how deep you want to go into the material, you can also just take note of them. This fundamentals book is aimed specifically at anyone who has no prior knowledge of electrical and electronic engineering, or who already has some knowledge but is looking for a practical and understandable guide to electrical engineering. No matter what age you are, what profession you have, whether you are a pupil, student or pensioner. This book is for anyone who wants or needs to learn about electrical engineering and electronics. The aim of this book is to introduce you to how electrical engineering accompanies us in everyday life and the basic principles involved. In addition, you will learn the basics of direct current technology and alternating current technology, their theoretical backgrounds and much more! Develop a basic understanding of electrical engineering and electronics in no time! Therefore, do not hesitate any longer, best take a look at the book and get your copy home as an ebook or paperback! Briefly summarized, you will learn the following in detail in this course: - Basic concepts and basic quantities of electrical engineering - How to analyze and solve electrical engineering circuits - Ohm's law, Ampere's law and Farady's law - Components such as resistor, diode (e.g. LED), transistor, capacitor, transformer, ..., and how they work and what they are used for - The difference between direct current and alternating current, as well as single-phase and multi-phase systems - How does electricity get into the house? Getting to know the power supply system - Direct current and alternating current motors and their structure / mode of operation - Outlook: Renewable energies such as photovoltaics and wind power - and much more! Take a look at the book and get your copy as an ebook or paperback!

Many, in their quest for knowledge in engineering, find typical textbooks intimidating. Perhaps due to an extensive amount of physics theory, an overwhelming barrage of math, and not enough practical application of the engineering principles, laws, and equations. Therein lies the difference between this text and those voluminous and daunting conventional university engineering textbooks. This text leads the reader into more complex and abstract content after explaining the electrical engineering concepts and principles in an easy to understand fashion, supported by analogies borrowed from day-to-day examples and other engineering disciplines. Many complex electrical engineering concepts, for example, power factor, are examined from multiple perspectives, aided by diagrams, illustrations, and examples that the reader can easily relate to. Throughout this book, the reader will gain a clear and strong grasp of electrical engineering fundamentals, and a better understanding of electrical engineering terms, concepts, principles, laws, analytical techniques, solution strategies, and computational techniques. The reader will also develop the ability to communicate with professional electrical engineers, controls engineers, and electricians on their "wavelength"

with greater confidence. Study of this book can help develop skills and preparation necessary for succeeding in the electrical engineering portion of various certification and licensure exams, including Fundamentals of Engineering (FE), Professional Engineering (PE), Certified Energy Manager (CEM), and many other trade certification tests. This text can serve as a compact and simplified electrical engineering desk reference. This book provides a brief introduction to the NEC®, the Arc-Flash Code, and a better understanding of electrical energy and associated cost. If you need to gain a better understanding of myriad battery alternatives available in the market, their strengths and weaknesses, and how batteries compare with capacitors as energy storage devices, this book can be a starting point. This book is ideal for engineers, engineering students, facility managers, engineering managers, program/project managers, and other executives who do not possess a current working knowledge of electrical engineering. Because of the simple explanations, analogies, and practical examples employed by the author, this book serves as an excellent learning tool for non-engineers, technical writers, attorneys, electrical sales professionals, energy professionals, electrical equipment procurement agents, construction managers, facility managers, and maintenance managers. 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.

An earnest attempt has been made in the book 'Basic Concepts of Electrical Engineering' to elucidate the principles and applications of Electrical Engineering and also its importance, so as to evince interest on the topics so that the student gets motivated to study the subject with interest.

Foundations of Electrical Engineering: Fields—Networks—Waves describes the general principles of electrical engineering, with emphasis on fields, networks, and waves. The limitations of validity are defined and methods of calculation are outlined. Examples are used to illustrate the theory and microphysical explanations based on simple models are given. This book is divided into five sections and begins with an overview of the inductive approach to Maxwell's equations, along with the uniqueness of their solution. Energy conversion in the electromagnetic field as well as the basic concepts of vector algebra and vector analysis are also considered. Subsequent chapters focus on static and steady fields, including cylindrically symmetrical fields and magnetic fields; the laws of network analysis and network synthesis; transient phenomena; and transmission lines. The remaining sections deal with electromagnetic waves, with emphasis on boundary value problems, and further developments in electrical engineering. This monograph will be of interest to students of electrical engineering and mathematics.

This book is designed as an introductory course for undergraduate students, in Electrical and Electronic, Mechanical, Mechatronics, Chemical and Petroleum engineering, who need fundamental knowledge of electrical circuits. Worked out examples have been presented after discussing each theory. Practice problems have also been included to enrich the learning experience of the students and professionals. PSpice and Multisim software packages have been included for simulation of different electrical circuit parameters. A number of exercise problems have been included in the book to aid faculty members.

As the name implies, this course is designed to provide a "Fundamental" approach to Electrical Engineering following the Fundamentals I course. We begin our journey with some basic circuit elements and develop a mathematically motivated approach to linear circuit analysis using Ordinary Differential Equations (ODEs) to discover Convolution, Laplace Transforms, Transfer Functions, and Frequency Filtering. The later lectures will cover variable frequency behavior. The series ends with how circuits behave and are modeled at high frequencies. Our goal with this text is two fold: 1. To provide a more specific, lecture-style approach for formal course documentation. Although large encyclopedic texts are useful as references, one will not be required for this course. 2. To dramatically reduce the cost for students and increase the flexibility of future editions by unconventionally self-publishing. The textbook industry has become too expensive for students to afford new books year after year and we feel that students should not have to bear the financial burden in addition to continually rising tuition costs. The low cost will hopefully encourage students to keep this packet as a reference as they professionally progress (rather than sell it back for cash to buy next semester's books!) Funds collected from sales directly help support further development of this packet and the course for future generations. We appreciate your help!

Technology has a major impact on the lives of people and the field of Electrical Engineering has its predominant role in our day to day life. The latest developments in the field of Electrical Engineering also help in faster technology innovations. Our life would be unthinkable without the use of electrical energy. Electrical engineers are at the forefront of some of today's most important innovations. Whether working for the private sector, government, or major research institutes, electrical engineers are always pushing the boundaries of the possible. Electrical lighting is indispensable for working during the dark hours of the day. With increasing industrialization, a growing proportion of electrical energy is used for the lighting of shops, offices, dwellings and for outdoor lighting. Man is relieved from heavy physical labor by the use of electrical devices. The drive of machines, hoisting gear and lifts is enabled in a simple form by the electromotor which in railway transport also has the advantage over internal combustion engines. There are many buildings where an air-conditioning system including heating, cooling and ventilation is installed for the operation of which electrical energy is required. Today's engineers must be able to communicate effectively within the interdisciplinary teams in which they work. Electrical, electronic and electromechanical systems are pervasive in all aspects of engineering design and analysis. This book entitled "Fundamentals Of Electrical Engineering" presents the comprehensive coverage on the fundamentals of electrical and electronic circuits, and of electronic and electromechanical systems using an approach that is designed to appeal to students from a variety of engineering disciplines as well as practitioners through applied examples and effective pedagogy. It is aimed to reflect the most modern trends and researches to exhibit the latest developments in the field of Electrical engineering. Exploring both theoretical and experimental work, the book focuses on worldwide contributions that are fundamental to the development of electrical power engineering and its applications.

This textbook provides comprehensive, in-depth coverage of the fundamental concepts of electrical

engineering. It is written from an engineering perspective, with special emphasis on circuit functionality and applications. Reliance on higher-level mathematics and physics, or theoretical proofs has been intentionally limited in order to prioritize the practical aspects of electrical engineering. This text is therefore suitable for a number of introductory circuit courses for other majors such as mechanical, biomedical, aerospace, civil, architecture, petroleum, and industrial engineering. The authors' primary goal is to teach the aspiring engineering student all fundamental tools needed to understand, analyze and design a wide range of practical circuits and systems. Their secondary goal is to provide a comprehensive reference, for both major and non-major students as well as practicing engineers.

Real-world engineering problems are rarely, if ever, neatly divided into mechanical, electrical, chemical, civil, and other categories. Engineers from all disciplines eventually encounter computer and electronic controls and instrumentation, which require at least a basic knowledge of electrical and other engineering specialties, as well as associated economics, and environmental, political, and social issues. Co-authored by Charles Gross—one of the most well-known and respected professors in the field of electric machines and power engineering—and his world-renowned colleague Thad Roppel, Fundamentals of Electrical Engineering provides an overview of the profession for engineering professionals and students whose specialization lies in areas other than electrical. For instance, civil engineers must contend with commercial electrical service and lighting design issues. Mechanical engineers have to deal with motors in HVAC applications, and chemical engineers are forced to handle problems involving process control. Simple and easy-to-use, yet more than sufficient in rigor and coverage of fundamental concepts, this resource teaches EE fundamentals but omits the typical analytical methods that hold little relevance for the audience. The authors provide many examples to illustrate concepts, as well as homework problems to help readers understand and apply presented material. In many cases, courses for non-electrical engineers, or non-EEs, have presented watered-down classical EE material, resulting in unpopular courses that students hate and senior faculty members understandably avoid teaching. To remedy this situation—and create more well-rounded practitioners—the authors focus on the true EE needs of non-EEs, as determined through their own teaching experience, as well as significant input from non-EE faculty. The book provides several important contemporary interdisciplinary examples to support this approach. The result is a full-color modern narrative that bridges the various EE and non-EE curricula and serves as a truly relevant course that students and faculty can both enjoy.

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

This book serves as a tool for any engineer who wants to learn about circuits, electrical machines and drives, power electronics, and power systems basics. From time to time, engineers find they need to brush up on certain fundamentals within electrical engineering. This clear and concise book is the ideal learning tool for them to quickly learn the basics or develop an understanding of newer topics. Fundamentals of Electric Power Engineering: From Electromagnetics to Power Systems helps non-electrical engineers amass power system information quickly by imparting tools and trade tricks for remembering basic concepts and grasping new developments. Created to provide more in-depth knowledge of fundamentals—rather than a broad range of applications only—this comprehensive and up-to-date book: Covers topics such as circuits, electrical machines and drives, power electronics, and power system basics as well as new generation technologies. Allows non-electrical engineers to build their electrical knowledge quickly. Includes exercises with worked solutions to assist readers in grasping concepts found in the book. Contains "in-depth" side bars throughout which pique the reader's curiosity. Fundamentals of Electric Power Engineering is an ideal refresher course for those involved in this interdisciplinary branch. For supplementary files for this book, please visit <http://booksupport.wiley.com/>

Fundamental Electrical and Electronic Principles covers the essential principles that form the foundations for electrical and electronic engineering courses, and provides the underpinning knowledge needed by a wide range of technician engineers. The text uses analogies to help students build their understanding of key topics, and encourages a methodical and logical approach to problem solving and written work. No prior knowledge of the subject is assumed. Clear explanations are supported throughout with worked examples and assignments (answers provided). New sections of Supplementary Worked Examples have been added in response to feedback from colleges. This book is an ideal text for a wide range of Further Education courses including City & Guilds certificates and NVQs (levels 2 and 3). The second edition has been matched to the latest specifications for BTEC National (2001/2 draft specifications), and Advanced VCE (GNVQ) Engineering (Curriculum 2000) and includes two brand new chapters on Semiconductor Theory and Devices and Semiconductor Circuits. It is also suitable for Intermediate GNVQ. First edition published by Arnold as Electrical and Electronic Principles, volume 1.

The technical systems we develop today are complicated. The challenges vehicle manufacturers are facing involve a combination of the fields of electronics, mechanics, control engineering, telecommunications, computer engineering, and software programming in order to realise the required functionality. This multi-disciplinary field of engineering is called mechatronics, and one of the key disciplines in this field is electronic engineering. Consequently, knowledge of the basic laws and principles of electronic engineering is mandatory for anyone who wants to work in the field of mechatronics. This book therefore explains the fundamentals of electrical engineering with an emphasis on mechatronic systems. Starting with basic laws, the main focus is on circuit analysis, including DC and AC circuits, transient effects, filters and oscillating circuits. Basic circuit elements are introduced as well as more complex semiconductor devices like operational amplifiers, bipolar junction transistors and MOSFET field-effect transistors. Finally, a short introduction to the important field of circuit simulation completes the book. The latest vehicles are classic examples of mechatronic systems. Automotive applications are therefore used throughout the book as examples to demonstrate the application of the discussed topics in a mechatronic environment.

Electrical Engineering 101 covers the basic theory and practice of electronics, starting by answering the question "What is electricity?" It goes on to explain the fundamental principles and components, relating them constantly to real-world examples. Sections on tools and troubleshooting give engineers deeper understanding and the know-how to create and maintain their own electronic design projects. Unlike other books that simply describe electronics and provide step-by-step build instructions, EE101 delves into how and why electricity and electronics work, giving the reader the tools to take their electronics education to the next level. It is written in a down-to-earth style and explains jargon, technical terms and schematics as they arise. The author builds a genuine understanding of the fundamentals and shows how they can be applied to a range of engineering problems. This third edition includes more real-world examples and a glossary of formulae. It contains new coverage of: Microcontrollers FPGAs Classes of components Memory (RAM, ROM, etc.) Surface mount High speed design Board layout Advanced digital electronics (e.g. processors) Transistor circuits and circuit design Op-amp and logic circuits Use of test equipment Gives readers a simple explanation of complex concepts, in terms they can understand and relate to everyday life. Updated content throughout and new material on the latest technological advances. Provides readers with an invaluable set of tools and references that they can use in their everyday work.

Rizzoni's Fundamentals of Electrical Engineering provides a solid overview of the electrical engineering discipline that is especially geared toward the many non-electrical engineering students who take this course. The book was developed to fit the growing trend of the Intro to EE course morphing into a briefer, less comprehensive course. The hallmark feature of this text is its liberal use of practical applications to illustrate important principles. The applications come from every field of engineering and feature exciting technologies. The appeal to non-engineering students are the special features such as Focus on Measurement sections, Focus on Methodology sections, and Make the Connections sidebars.

This Book extensive pruning of the solved Examples in the text. Majority of the old examples have been replaced by questions set in the latest examination papers of different engineering colleges and technical institutions.

Electricity is an integral part of life in modern society. It is one form of energy and can be transported and converted into other forms. Throughout the world electricity is used to light homes and streets, cook meals, power computers and run industrial plants. Electricity is so integrated with our way of living that electricity consumption per person is used to measure the levels of economic de-

velopment of countries. Any disruptions to electricity supply or blackouts will lead to huge financial loss and threats to lives well-being in the community. Electrical engineering is the profession and study of generating, transmitting, controlling and using electrical energy. It offers a wide range of exciting opportunities to those looking for a fulfilling, challenging and professional career. Electrical engineers are the designers of modern electrical machinery, power systems, transportation and communication systems. They work in various sectors of the community as well including the building industry, the manufacturing industry, the construction industry, consultancy services, technology development, education services as well as government. In these volumes, the essential aspects and fundamentals of electrical engineering are presented. In depth knowledge of various areas of electrical engineering are disseminated by learned scholars in their fields. It is hoped that readers will find all the writings comprehensive, informative and interesting. It is further hoped that these fundamentals will assist the readers to study advanced topics in electrical engineering. If the readers are electrical engineers themselves, it is hoped that the articles will broaden their horizon in electrical engineering and provide them with the necessary knowledge to further their profession as electrical engineers.