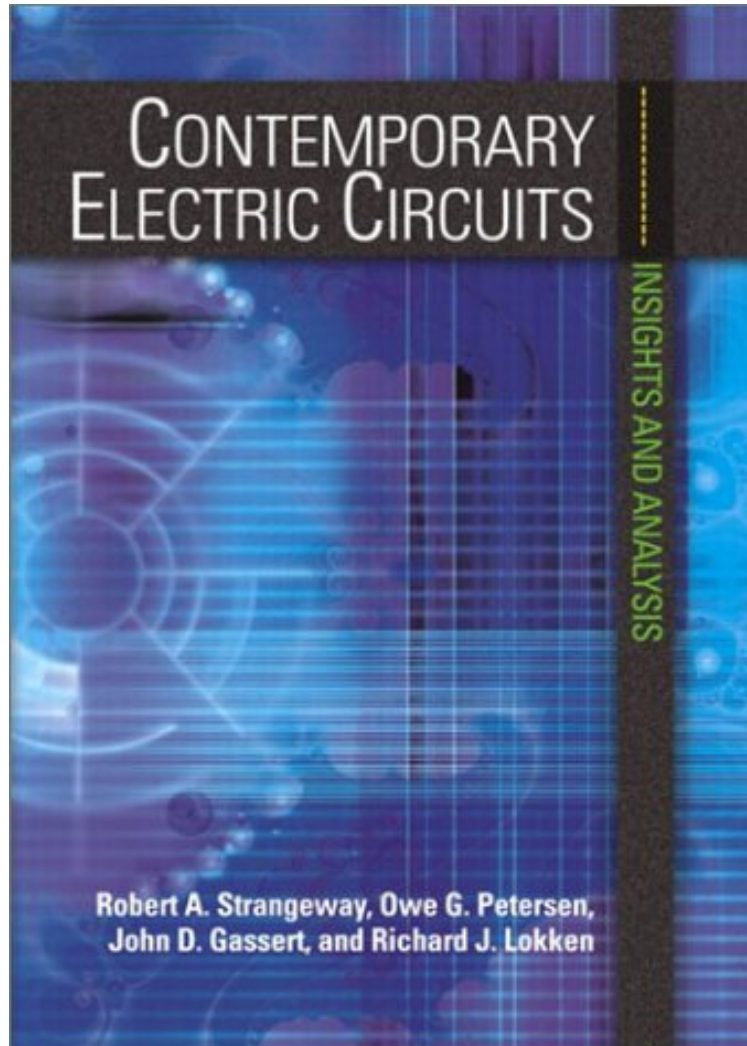


[FREE] Contemporary Electric Circuits: Insights and Analysis

Contemporary Electric Circuits: Insights and Analysis

Robert A. Strangeway, Owe G. Petersen, John D. Gassert, Richard J. Lokken
audiobook / *ebooks / Download PDF / ePub / DOC



#1991896 in Books 2002-07-22 Original language: English PDF # 1 11.00 x 1.10 x 8.70l, 2.67 #File Name: 0130934267480 pages | File size: 61.Mb

Robert A. Strangeway, Owe G. Petersen, John D. Gassert, Richard J. Lokken : Contemporary Electric Circuits: Insights and Analysis before purchasing it in order to gauge whether or not it would be worth my time, and all praised Contemporary Electric Circuits: Insights and Analysis:

0 of 2 people found the following review helpful. Very poorly written By Debi This book does not explain the concepts clear enough for beginning electrical engineering students. There are examples, but they are not clear. Also, the book barely touches on the superposition theorem, but it does not mention the more widely used loop analysis method. I would not recommend this book for anyone.

For combined DC/AC Circuit Analysis courses and separate DC and AC Circuit Analysis courses in Engineering Technology and Technology programs. This succinct, but thorough treatment of DC and AC circuits analysis effectively communicates the concepts and techniques of circuit analysis with a focused practical style that keeps students motivated. The text starts at a level that the majority of students can grasp and continues with clear, focused explanations that advance students to the desired level proficiency.

From the Back Cover This outstanding text has clearly established its niche as a focused, efficient, and stimulating introduction to electric circuits analysis. It challenges the reader to master the fundamental concepts and understand how and why circuits work. Special cases receive less attention, enabling readers to build a solid foundation of essential knowledge without distraction or diversion. Contemporary Electric Circuits: Insights and Analysis has been successfully class-tested in various course settings. The sections and chapters of this book are carefully organized for compatibility with a single DC/AC course, a combined DC/AC courses sequence, and a DC course/AC course sequence. Supplemental materials are available from Prentice Hall to enhance the learning process. They include Laboratory Manual Instructor's Solutions Manual with Test Item File Prentice Hall Test Manager PowerPoint Transparencies CD-ROM Electronics Supersite: <http://www.prenhall.com/electronics> Excerpt. Reprinted by permission. All rights reserved. This book is very different from other DC/AC texts in very important ways. While we heartily agree that the world doesn't need another 1000-plus page book on this well-established topic, we do believe that there is an urgent need for a textbook that focuses on the primary concepts and techniques of circuit analysis and efficiently communicates them. Therefore, we have streamlined our coverage of DC and AC circuit analysis and produced a book with half the usual page count. Admittedly, every special case is not covered. But, then, such exhaustive study diverts the students' attention and dilutes the message. This book reflects our philosophy of always emphasizing why when relating the fundamental concepts. Its aim is to convey the needed core knowledge and to promote students' intellectual growth, not just cover reams of material. After the students understand the fundamentals, then they can build on that knowledge, perhaps exploring the many special cases on their own, as needed.

Basic Approaches and Important Features The following key features of this approach to DC and AC circuit analysis in this textbook include: Efficient yet effective communication of the key principles Emphasis on what, how, and why Identification of practical aspects to keep students connected and motivated Elimination of redundancy (and text length) in utilization of key circuit analysis principles ("don't make a special case out of every variation"), yet use of redundancy where needed to reinforce and extend principles (for example, extending a DC concept to AC) Use of a "ramp-up" approach of the academic level: the level of the material and students' performance expectations generally increases as one proceeds further into the text (don't submerge the students from the first day; let the students "wade in") Discussion that shows students how to think about circuits problems, how to pose questions, how to try approaches, how to formulate strategies, how to solve problems requiring multistep solutions, and so on Use of enough but not an overwhelming number of examples to accomplish the desired learning (again, too many examples, especially with too many special cases, dilute the message) Effective organization for sound pedagogy: the initial chapters will be mandatory and will be set in the context of a "minimum" DC/AC circuits course, while the subsequent chapters and/or sections will be as independent as possible and selectable as needed for individual programs. Prerequisite chapters and/or sections for later chapters will be clearly established and identified at the end of this Preface. Chapter and section organization that is compatible with a single DC/AC course, with a DC/AC multicourse sequence, and with a DC course/AC course sequence Selective use of first and second person in the text to engage the student readers; although not all faculty would write in this manner, the authors have found that this writing style generally helps new college students adapt to the standard third-person writing style in engineering and engineering technology yours is an appropriate goal for a freshman-level textbook in this field Gradual conceptual development of the distinction between circuits and signals Inclusion of learning objectives and chapter review concepts to help students realize what the fundamental concepts are, as well as to understand them Introduction to the concept of derivations and motivation for derivations Incorporation of library and/or web research exercises to expand informational topics and to promote historical awareness Incorporation of the role of circuit simulation where simulation is appropriate: manual circuit analysis and analysis by circuit simulation are set in the context of when it is appropriate to use each method; separate publications cover the actual circuit simulation tools (Pspice and MultiSim) A separate Laboratory Manual that reinforces circuit analysis understanding, utilizes circuit simulation, and helps students to develop electrical measurement skills and insight Instructor support materials, including: Laboratory Manual Instructor's Resource Manual with homework and laboratory manual solutions Prentice Hall Test Manager (a computerized test bank) Who Will Benefit from Using this Text? The primary anticipated audiences include two- and four-year electrical and electronics engineering technology programs in the first DC/AC circuits courses. The text is a strong candidate for technology programs and nonelectrical/electronics engineering technology programs and for programs where a single circuits course is needed. The text can also be used in an introductory freshman survey course in an engineering program, especially a noncalculus-based course.

Organization and Coverage The organization of the material in this textbook and the logic behind it is as follows. The first chapter is a discussion of the nature of

electricity, why electricity is needed, and where electricity is used, etc. The chapter sets the tone for the readers: the electrical energy viewpoint is introduced, and this viewpoint forms the basis for our approach in subsequent chapters. Some of the motivation 'includes connecting the course to modern issues, such as safety, electromagnetic compliance, and CE requirements. A section covers scientific notation and unit prefixes. The importance of proper units conversion and an organized method to convert units are then examined. The computational tools used in electronics are discussed to help establish a perspective for students, especially the role of circuit simulation in circuit analysis. From both pedagogical and motivational viewpoints, the authors assert that this crucial chapter should not be "skipped." Readers will notice the "ramp-up" approach in these first few chapters. The initial content is not introduced full-force, but rather the depth of the topical matter generally increases as the text proceeds, especially in the first few chapters. For example, the discussion of current flow is less intensive than it would be if it occurred later in the course or curriculum, but the depth is sufficient for students to continue building their conceptual foundation and understanding of electronics. Typical engineering technology students are often adapting to college itself as well as adjusting to the expectations of college course work. Hitting students with everything at once rarely helps this process and may even reduce the students' motivation for the electronics field. A relatively short ramp-up is designed into the initial chapters for this reason. The concepts and definitions of the fundamental electrical quantities, namely charge, current, voltage, and resistance, are built from the theme of electrical energy and power in Chapter 2. Resistance is established to represent energy conversion. Ohm's law is established as the voltage-current relationship for resistance and is connected to electric power and energy to complete the voltage, current, resistance, energy, and power relationships. Resistors are presented as an important example of resistance. Resistor types are briefly surveyed, and web information research assignments are suggested to expand this coverage. Wire resistance is addressed through the conventional calculations and tables for wires. Meters and other instrumentation coverage are not included; they are covered in the Laboratory Manual instead. The motivation for different circuit configurations is introduced in Chapter 3a. The circuit concepts and analysis techniques are covered for series, parallel, and series-parallel circuits. Resistor combinations, Kirchhoff's laws, and the voltage and current divider rules are explained and used. Superposition is established as one method to analyze multiple-source circuits using these same techniques. Practical sources and the current source are examined. Although this chapter is somewhat long, the circuit analysis topics are kept together to emphasize the complementary relationships between circuit analysis laws and techniques an important concept for students to realize. The emphasis of Chapter 4 is that an alternating current (AC) sinusoidal steady-state signal is a function of time. The topics covered include what an alternating current signal is, how the plots of sinusoids relate to the actual signal, and how the AC sinusoidal steady-state expressions relate to the plots and actual signals. Peak voltage and current, RMS voltage and current, and power in a resistance are used to continue the theme that electric circuits are used for energy transfer. The similarity of analyses between DC and AC resistive circuits is emphasized. Phasor notation is not introduced until Chapter 8. The next two chapters utilize electric and magnetic fields to explain capacitor and inductor behavior, respectively. The authors have found that the introduction of too many electromagnetic field concepts this early in an engineering technology curriculum serves to confuse typical students. Students typically respond with fruitless memorization and frustration. Hence; the approach utilized here is to introduce just enough electric and magnetic field concepts to accomplish the fundamental goals of understanding how capacitors and inductors respond in DC and AC circuits. The operation of the capacitor is studied with the electric field intensity concept but without the electric flux density concept. The operation of magnets and the inductor is studied with the magnetic flux concept but without the magnetic field intensity concept. The authors are of the opinion that a fuller understanding of electric and magnetic fields should come in a subsequent physics or higher-level electromagnetic fields course, not all at once in a freshman-level electric circuits course. The ...