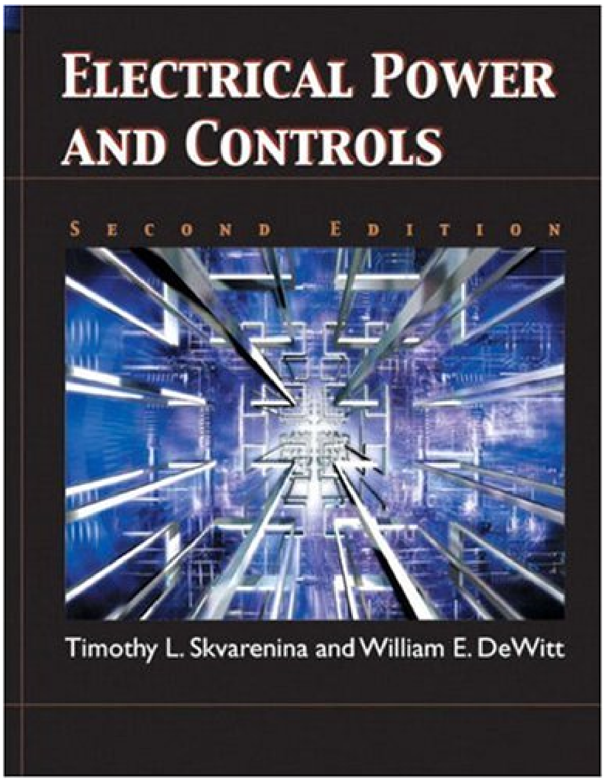
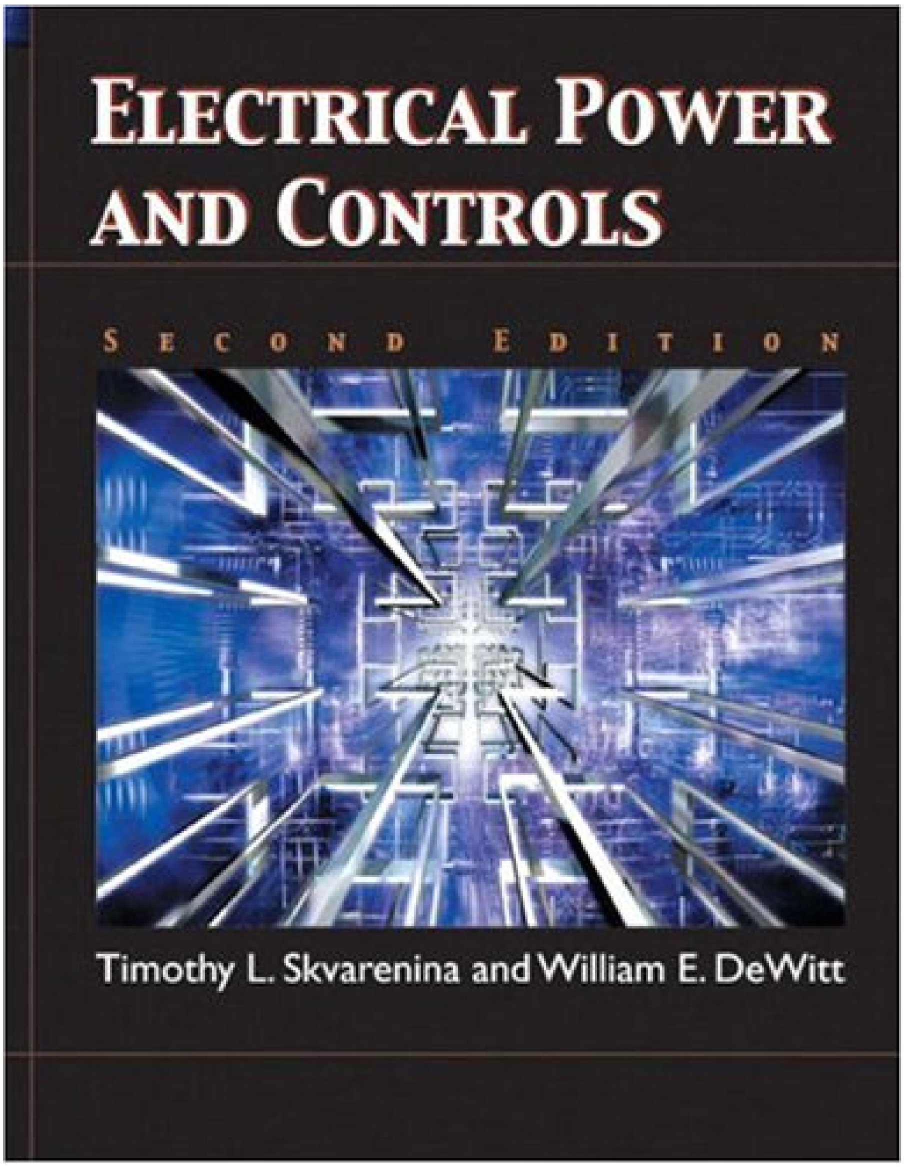
ELECTRICAL POWER AND CONTROLS (2ND EDITION) BY TIMOTHY L. SKVARENINA, WILLIAM E. DEWITT




ELECTRICAL POWER AND CONTROLS
SECOND EDITION
Timothy L. Skvarenina and William E. DeWitt

ELECTRICAL POWER AND CONTROLS (2ND EDITION) BY TIMOTHY L. SKVARENINA, WILLIAM E. DEWITT PDF

As recognized, book *Electrical Power And Controls (2nd Edition) By Timothy L. Skvarenina, William E. DeWitt* is popular as the window to open up the globe, the life, as well as extra point. This is just what the people currently require so much. Also there are many people which don't like reading; it can be a choice as reference. When you actually need the methods to develop the next inspirations, book Electrical Power And Controls (2nd Edition) By Timothy L. Skvarenina, William E. DeWitt will truly lead you to the method. Additionally this Electrical Power And Controls (2nd Edition) By Timothy L. Skvarenina, William E. DeWitt, you will have no regret to obtain it.

From the Back Cover

This broadly-based book covers both motors and power transmission, and starts with the fundamentals of energy and power systems. It progresses though power quality transformers, motors/generators, power electronics, control devices/circuits, building electrical systems, and programmable logic controllers.

The second edition includes:

- Extensive use of figures and photos to reinforce concepts discussed in the text
- Additional review questions and problems at the end of most chapters
- New case studies on societal and global issues relating to engineering and technology
- Additional material to reflect changes in the industry

Since the first edition of this text, a number of events have occurred in the poi industry. Among them were the California energy crisis, the Enron Collapse, the Kyoto Protocol, and most recently, the August 14, 2003, blackout in the Northeaster United States and Ontario, Canada. In addition, the Accreditation Board for Engineering and Technology (ABET) has instituted new requirements for engineering and technology programs. Specifically, accredited programs must demonstrate that their graduates have u understanding of ethical responsibilities and a knowledge of societal and global issues as they relate to the practice of engineering and technology. This second edition includes several case studies relating to these issues that can help achieve the ABET outcomes. In addition, we have added new material and additional end-of-chapter problems throughout the text. Specific changes are described below.

As we noted in the first edition, communications, electronics, and power have converged to provide more efficient manufacturing processes for various types of industry Many motors are installed with electronic drives, programmable logic controllers are finding widespread application, and communications networks at the device, control, and information levels are used to monitor many industrial processes. Engineers and technologists today, and in the future, will require a broad background in all of these areas.

Unfortunately, the time available in the typical curriculum is fixed, and in some cases the number of hours required for a degree has decreased. Thus, like many electric power instructors, we have been confronted by pressures to eliminate the required power course from our electrical engineering technology curriculum in favor of something that is "more worthwhile" in the view of many of our colleagues. The challenge to us was to show the value that was added by our course for the majority of our graduates. Thus, we found it necessary to move away from a course that dealt almost exclusively with electric machines and transformer theory to one that includes the principles of operation and application of motors, motor controls, power quality, power electronics, motor circuit design, programmable logic controllers, arid other topics that a typical graduate might encounter in the workplace. As we developed our course, it became evident to us that there was no one text that covered all of the topics that we wanted to include. Thus, we-began writing our own text. Although this text was developed to support a one-semester sophomore course in electrical engineering technology, we have included much more material than could be covered in a single semester. This allows a great deal of flexibility in the design of a course using this text. This text uses primarily algebra and trigonometry for calculations and derivations; however, some calculus (primarily integrals) is used, particularly for Faraday's law. In general, the calculus can be skipped by those who have not had an introductory calculus course. Throughout the book we have made extensive use of figures and photos to reinforce the text discussion. We feel this is particularly important for today's traditional college students who are much more visually oriented and less inclined to read lengthy discussions. Recognizing the reluctance of students to read, we have included review questions at the end of most chapters in addition to problems. Assignment of questions can have a twofold benefit. First, it helps force the student to read the material, and second, it allows the incorporation of written assignments, which is emphasized by accreditation agencies and industry alike.

Although our course has a physics course as a prerequisite, we have found that the students often do not remember the concepts of force, torque, energy, and power and the relations among them. Thus, Chapter 1 presents a review of these basics, which allows us to introduce examples related to the electric power industry, such as pumped-water storage. By introducing the concept of energy storage in electric fields (capacitors) and magnetic fields (inductors), the student is prepared for the discussion of reactive power in Chapter 2. Chapter 1 also introduces the electric power system and discusses some of the current events, such as deregulation and the projected decline of nuclear generation. We have added three case studies at the end of Chapter 1. These address the Kyoto Protocol and global warming, the California electricity crisis, and the Enron collapse. These case studies can be used to help develop the student's sense of ethics and global perspectives. We typically cover the basic material in Chapter 1 with one to two lectures. Each case study can easily be the basis for a full class period.

We have modified and expanded Chapter 2, which provides a review of basic electric power calculations including a review of phasors and single-phase and three-phase electric power. The concepts of real, reactive, and apparent AC power are presented as they are used throughout the text. This chapter now covers these topics in more detail and does not assume that the student has seen the material in a previous course. Because our students have seen this material before, we cover the material quickly in two lectures. We have also added a power factor correction case study to Chapter 2, which provides a real-world example of the importance of a high power factor.

Due to the widespread use of electronics in the commercial and industrial workplaces, the issue of power quality has become extremely important. Every individual who uses electronic equipment contributes to the power quality problem. Thus, we believe that every electrical engineer and technologist should be aware of the problems caused by the equipment they or others use. In Chapter 3, we introduce the concept of power quality using the CBEMA-ITIC curve. This curve includes not only steady-state phenomena but also transients. Thus, we have included a discussion of transient voltage surge suppressors (TVSS) that can benefit every individual who wishes to provide protection for a personal computer, whether at home or in the workplace. We have also included a discussion of uninterruptible power supplies (UPSs), as the advertising for these devices is often short on facts and long on claims. The sections on TVSS and UPS devices have been rewritten to include the latest standards. The heart of Chapter 3, however, is the discussion of harmonics in the power system. The concept of harmonics is introduced here and is continued in later chapters when transformers, induction motors, and variable-speed drives are discussed.

Since one of the goals of our course is for the students to understand the operation of transformers and motors, some background in magnetic properties and materials is required. Chapter 4 introduces the concepts of flux, flux density, permeability, magnetic field intensity, reluctance, ferromagnetic materials, and losses due to hysteresis and eddy currents in magnetic materials. The emphasis is not to provide enough information for the students to become machine designers, but rather to give enough background so they can understand the principles of operation of the devices.

Chapter 5 introduces the first of the components of the power system—the transformer. The ideal transformer is introduced first and then the underlying assumptions are removed to produce an equivalent circuit for the transformer. Single-phase transformers are examined in detail, followed by a discussion of transformer bandwidth for electronics circuits, K-factor (harmonic) rated transformers, autotransformers, instrument transformers, and three-phase transformers. After the development of the transformer model, the topics are essentially independent, so the instructor can skip over sections that are not of interest. We have added several pictures to this chapter and additional emphasis on efficiency.

Because some instructors prefer to present AC machines before DC and others prefer the opposite, we have included Chapter 6 to develop the basic concepts of motor and generator operation for both types of machines. Chapter 6 can be followed by Chapter 7, "Three-Phase Induction Motors," Chapter 10, "The Synchronous Machine," or Chapter 11, "DC Machines," depending on the desires of the instructor or reader. Because we believe that most students will encounter AC machines in the workplace, we present the AC machine first in Chapter 6. The basic components of the synchronous machine are presented and the rotating magnetic field in the three-phase stator winding is developed in preparation for discussion of the induction motor. Following the AC machine, the DC machine is presented in a similar manner.

Chapter 7 presents the polyphase induction motor. The emphasis of this chapter is on practical, application-oriented material, beginning with the construction features and nameplate information and concluding with wiring diagrams and reduced-voltage. The equivalent circuit for the induction motor is developed for those who feel it is important; however, we typically skip over that section and use the equivalent circuit primarily to discuss the losses in the induction motor. Following the calculation of motor efficiency, the requirements of the National Energy Policy Act (NEPACT) of 1992 for the induction motor are discussed. Throughout the chapter, NEMA standards and requirements are discussed. This second edition includes a discussion of the NEMA-PremiumTM motor program and a case study of how one manufacturer found it economical to replace all of the motors in a plant.

Chapter 8 presents several types of single-phase induction motors and the universal motor. The primary emphasis of this chapter is understanding the differences in construction and performance of the various machines rather than mathematical analysis. Speed control of the shaded-pole induction motor by varying the number of turns in the stator windings is discussed.

Power electronics is an increasingly important topic due to the widespread use of variable-speed drives in industry. Chapter 9 begins with a discussion of a variety of solid-state power switches, including various types of diodes and transistors. This material is provided for completeness and to allow the practicing engineer/technologist to compare different technologies, and has been expanded from the first edition. Photos of the various devices are included to help the student understand what the devices look like.

However, depending on the preferences of the instructor or reader, that material could be omitted. Following the discussion of switching technologies, the variable-frequency AC motor drive is discussed with primary emphasis on the induction motor. The chapter concludes with discussions of stepper motors and brushless DC motors, which are becoming increasingly important. There is a new case study showing an industrial application of variable speed drives.

The synchronous machine is presented in detail in Chapter 10. Both round-rotor and salient-pole machines are discussed, although the primary emphasis is on the round-rotor case. Phasor diagrams are used extensively to illustrate the operation of the synchronous machine.

Chapter 11 begins with a discussion of the operation and construction of the DC machine, followed by a detailed discussion of commutation. Generator and motor operation of the various types of DC machines (series, shunt, compound) are presented, and the chapter concludes with a discussion of efficiency of the DC machine.

Motors must be started and stopped and that is normally done with a control system. Chapter 12 presents the basics of control systems. A variety of control devices—relays, switches, pilot devices, motor starters, contactors, etc.—are discussed followed by some basic considerations of ladder diagrams. Reduced-voltage starters and reversible starters for AC machines are presented followed by starters for DC motors. We have added a section on safety controls in Chapter 12 as machine safety is becoming very important in industry.

Following the presentation of motor starters and overload sensors in Chapter 12, Chapter 13 presents the fundamentals of power circuit design. The use of National Electric Code tables is emphasized in the design of motor circuits and voltage drop calculations. Programmable logic controllers (PLCs) are being used for a wide variety of applications in the commercial, industrial, and institutional markets. As an example of how widespread they have become, our university has installed micro-PLCs in many classrooms to control lighting levels via dimming ballasts on the fluorescent lights. As a result, we have devoted two weeks of the semester to PLCs. Chapter 14 provides some background of what a PLC is and what it is used for, a review of binary and octal arithmetic calculations, and discussion of the scanning cycle. The Allen Bradley PLC 5 is used as an example for discussing the programming commands, addressing schemes, and memory structure of PLCs. In this second edition, we have also included SLC 500 programming information. Much of the material would be similar for other PLCs and could be supplemented by PLC-specific information, such as addressing techniques.

ELECTRICAL POWER AND CONTROLS (2ND EDITION) BY TIMOTHY L. SKVARENINA, WILLIAM E. DEWITT PDF

Do you believe that reading is an important activity? Find your reasons adding is important. Reading a book **Electrical Power And Controls (2nd Edition) By Timothy L. Skvarenina, William E. DeWitt** is one part of enjoyable tasks that will make your life quality much better. It is not about only what kind of e-book Electrical Power And Controls (2nd Edition) By Timothy L. Skvarenina, William E. DeWitt you check out, it is not just regarding the amount of publications you check out, it's concerning the practice. Reading routine will certainly be a means to make publication Electrical Power And Controls (2nd Edition) By Timothy L. Skvarenina, William E. DeWitt as her or his good friend. It will despite if they invest money and spend even more e-books to complete reading, so does this e-book Electrical Power And Controls (2nd Edition) By Timothy L. Skvarenina, William E. DeWitt

For everyone, if you intend to begin joining with others to read a book, this *Electrical Power And Controls (2nd Edition) By Timothy L. Skvarenina, William E. DeWitt* is much recommended. And also you should get guide Electrical Power And Controls (2nd Edition) By Timothy L. Skvarenina, William E. DeWitt below, in the web link download that we provide. Why should be right here? If you want various other kind of publications, you will always discover them as well as Electrical Power And Controls (2nd Edition) By Timothy L. Skvarenina, William E. DeWitt Economics, politics, social, scientific researches, religious beliefs, Fictions, and also more publications are provided. These available publications are in the soft files.

Why should soft data? As this Electrical Power And Controls (2nd Edition) By Timothy L. Skvarenina, William E. DeWitt, many people also will should acquire the book faster. Yet, in some cases it's so far way to obtain guide Electrical Power And Controls (2nd Edition) By Timothy L. Skvarenina, William E. DeWitt, also in other nation or city. So, to alleviate you in discovering guides Electrical Power And Controls (2nd Edition) By Timothy L. Skvarenina, William E. DeWitt that will assist you, we aid you by providing the listings. It's not only the listing. We will certainly offer the suggested book Electrical Power And Controls (2nd Edition) By Timothy L. Skvarenina, William E. DeWitt web link that can be downloaded and install straight. So, it will certainly not need even more times as well as days to position it and also various other books.

ELECTRICAL POWER AND CONTROLS (2ND EDITION) BY TIMOTHY L. SKVARENINA, WILLIAM E. DEWITT PDF

Broad in scope, yet deep in content, this book offers unique, single-volume coverage of machines, transformers, controls, and electrical power distribution. The focus throughout is on topics that engineers and technologists today—and in the future—will encounter in the workplace—e.g., the principles of operation and application of motors, motor controls, power quality, power electronics, motor circuit design, programmable logic controllers, etc. For electrical engineers, computer technology employees, mechanical engineers, and others in production or marketing fields.

- Sales Rank: #1022946 in Books
- Published on: 2004-03-29
- Original language: English
- Number of items: 1
- Dimensions: 9.06" h x 1.70" w x 7.50" l, 3.03 pounds
- Binding: Paperback
- 752 pages

From the Back Cover

This broadly-based book covers both motors and power transmission, and starts with the fundamentals of energy and power systems. It progresses though power quality transformers, motors/generators, power electronics, control devices/circuits, building electrical systems, and programmable logic controllers.

The second edition includes:

- Extensive use of figures and photos to reinforce concepts discussed in the text
- Additional review questions and problems at the end of most chapters
- New case studies on societal and global issues relating to engineering and technology
- Additional material to reflect changes in the industry

Since the first edition of this text, a number of events have occurred in the poi industry. Among them were the California energy crisis, the Enron Collapse, the Kyoto Protocol, and most recently, the August 14, 2003, blackout in the Northeaster United States and Ontario, Canada. In addition, the Accreditation Board for Engineering and Technology (ABET) has instituted new requirements for engineering and technology programs. Specifically, accredited programs must demonstrate that their graduates have u understanding of ethical responsibilities and a knowledge of societal and global issues as they relate to the practice of engineering and technology. This second edition includes several case studies relating to these issues that can help achieve the ABET outcomes. In addition, we have added new material and additional end-of-chapter problems throughout the text. Specific changes are described below.

As we noted in the first edition, communications, electronics, and power have converged to provide more efficient manufacturing processes for various types of industry Many motors are installed with electronic drives, programmable logic controllers are finding widespread application, and communications networks at the device, control, and information levels are used to monitor many industrial processes. Engineers and technologists today, and in the future, will require a broad background in all of these areas.

Unfortunately, the time available in the typical curriculum is fixed, and in some cases the number of hours required for a degree has decreased. Thus, like many electric power instructors, we have been confronted by pressures to eliminate the required power course from our electrical engineering technology curriculum in favor of something that is "more worthwhile" in the view of many of our colleagues. The challenge to us was to show the value that was added by our course for the majority of our graduates. Thus, we found it necessary to move away from a course that dealt almost exclusively with electric machines and transformer theory to one that includes the principles of operation and application of motors, motor controls, power quality, power electronics, motor circuit design, programmable logic controllers, arid other topics that a typical graduate might encounter in the workplace. As we developed our course, it became evident to us that there was no one text that covered all of the topics that we wanted to include. Thus, we-began writing our own text. Although this text was developed to support a one-semester sophomore course in electrical engineering technology, we have included much more material than could be covered in a single semester. This allows a great deal of flexibility in the design of a course using this text. This text uses primarily algebra and trigonometry for calculations and derivations; however, some calculus (primarily integrals) is used, particularly for Faraday's law. In general, the calculus can be skipped by those who have not had an introductory calculus course. Throughout the book we have made extensive use of figures and photos to reinforce the text discussion. We feel this is particularly important for today's traditional college students who are much more visually oriented and less inclined to read lengthy discussions. Recognizing the reluctance of students to read, we have included review questions at the end of most chapters in addition to problems. Assignment of questions can have a twofold benefit. First, it helps force the student to read the material, and second, it allows the incorporation of written assignments, which is emphasized by accreditation agencies and industry alike.

Although our course has a physics course as a prerequisite, we have found that the students often do not remember the concepts of force, torque, energy, and power and the relations among them. Thus, Chapter 1 presents a review of these basics, which allows us to introduce examples related to the electric power industry, such as pumped-water storage. By introducing the concept of energy storage in electric fields (capacitors) and magnetic fields (inductors), the student is prepared for the discussion of reactive power in Chapter 2. Chapter 1 also introduces the electric power system and discusses some of the current events, such as deregulation and the projected decline of nuclear generation. We have added three case studies at the end of Chapter 1. These address the Kyoto Protocol and global warming, the California electricity crisis, and the Enron collapse. These case studies can be used to help develop the student's sense of ethics and global perspectives. We typically cover the basic material in Chapter 1 with one to two lectures. Each case study can easily be the basis for a full class period.

We have modified and expanded Chapter 2, which provides a review of basic electric power calculations including a review of phasors and single-phase and three-phase electric power. The concepts of real, reactive, and apparent AC power are presented as they are used throughout the text. This chapter now covers these topics in more detail and does not assume that the student has seen the material in a previous course. Because our students have seen this material before, we cover the material quickly in two lectures. We have also added a power factor correction case study to Chapter 2, which provides a real-world example of the importance of a high power factor.

Due to the widespread use of electronics in the commercial and industrial workplaces, the issue of power quality has become extremely important. Every individual who uses electronic equipment contributes to the power quality problem. Thus, we believe that every electrical engineer and technologist should be aware of the problems caused by the equipment they or others use. In Chapter 3, we introduce the concept of power quality using the CBEMA-ITIC curve. This curve includes not only steady-state phenomena but also transients. Thus, we have included a discussion of transient voltage surge suppressors (TVSS) that can benefit every individual who wishes to provide protection for a personal computer, whether at home or in the workplace. We have also included a discussion of uninterruptible power supplies (UPSs), as the advertising for these devices is often short on facts and long on claims. The sections on TVSS and UPS devices have been rewritten to include the latest standards. The heart of Chapter 3, however, is the discussion of harmonics in the power system. The concept of harmonics is introduced here and is continued in later chapters when transformers, induction motors, and variable-speed drives are discussed.

Since one of the goals of our course is for the students to understand the operation of transformers and motors, some background in magnetic properties and materials is required. Chapter 4 introduces the concepts of flux, flux density, permeability, magnetic field intensity, reluctance, ferromagnetic materials, and losses due to hysteresis and eddy currents in magnetic materials. The emphasis is not to provide enough information for the students to become machine designers, but rather to give enough background so they can understand the principles of operation of the devices.

Chapter 5 introduces the first of the components of the power system—the transformer. The ideal transformer is introduced first and then the underlying assumptions are removed to produce an equivalent circuit for the transformer. Single-phase transformers are examined in detail, followed by a discussion of transformer bandwidth for electronics circuits, K-factor (harmonic) rated transformers, autotransformers, instrument transformers, and three-phase transformers. After the development of the transformer model, the topics are essentially independent, so the instructor can skip over sections that are not of interest. We have added several pictures to this chapter and additional emphasis on efficiency.

Because some instructors prefer to present AC machines before DC and others prefer the opposite, we have included Chapter 6 to develop the basic concepts of motor and generator operation for both types of machines. Chapter 6 can be followed by Chapter 7, "Three-Phase Induction Motors," Chapter 10, "The Synchronous Machine," or Chapter 11, "DC Machines," depending on the desires of the instructor or reader. Because we believe that most students will encounter AC machines in the workplace, we present the AC machine first in Chapter 6. The basic components of the synchronous machine are presented and the rotating magnetic field in the three-phase stator winding is developed in preparation for discussion of the induction motor. Following the AC machine, the DC machine is presented in a similar manner.

Chapter 7 presents the polyphase induction motor. The emphasis of this chapter is on practical, application-oriented material, beginning with the construction features and nameplate information and concluding with wiring diagrams and reduced-voltage. The equivalent circuit for the induction motor is developed for those who feel it is important; however, we typically skip over that section and use the equivalent circuit primarily to discuss the losses in the induction motor. Following the calculation of motor efficiency, the requirements of the National Energy Policy Act (NEPACT) of 1992 for the induction motor are discussed. Throughout the chapter, NEMA standards and requirements are discussed. This second edition includes a discussion of the NEMA-PremiumTM motor program and a case study of how one manufacturer found it economical to replace all of the motors in a plant.

Chapter 8 presents several types of single-phase induction motors and the universal motor. The primary emphasis of this chapter is understanding the differences in construction and performance of the various machines rather than mathematical analysis. Speed control of the shaded-pole induction motor by varying the number of turns in the stator windings is discussed.

Power electronics is an increasingly important topic due to the widespread use of variable-speed drives in industry. Chapter 9 begins with a discussion of a variety of solid-state power switches, including various types of diodes and transistors. This material is provided for completeness and to allow the practicing engineer/technologist to compare different technologies, and has been expanded from the first edition. Photos of the various devices are included to help the student understand what the devices look like. However, depending on the preferences of the instructor or reader, that material could be omitted. Following the discussion of switching technologies, the variable-frequency AC motor drive is discussed with primary emphasis on the induction motor. The chapter concludes with discussions of stepper motors and brushless DC motors, which are becoming increasingly important. There is a new case study showing an industrial application of variable speed drives.

The synchronous machine is presented in detail in Chapter 10. Both round-rotor and salient-pole machines are discussed, although the primary emphasis is on the round-rotor case. Phasor diagrams are used extensively to illustrate the operation of the synchronous machine.

Chapter 11 begins with a discussion of the operation and construction of the DC machine, followed by a detailed discussion of commutation. Generator and motor operation of the various types of DC machines (series, shunt, compound) are presented, and the chapter concludes with a discussion of efficiency of the DC machine.

Motors must be started and stopped and that is normally done with a control system. Chapter 12 presents the basics of control systems. A variety of control devices—relays, switches, pilot devices, motor starters, contactors, etc.—are discussed followed by some basic considerations of ladder diagrams. Reduced-voltage starters and reversible starters for AC machines are presented followed by starters for DC motors. We have added a section on safety controls in Chapter 12 as machine safety is becoming very important in industry.

Following the presentation of motor starters and overload sensors in Chapter 12, Chapter 13 presents the fundamentals of power circuit design. The use of National Electric Code tables is emphasized in the design of motor circuits and voltage drop calculations. Programmable logic controllers (PLCs) are being used for a wide variety of applications in the commercial, industrial, and institutional markets. As an example of how widespread they have become, our university has installed micro-PLCs in many classrooms to control lighting levels via dimming ballasts on the fluorescent lights. As a result, we have devoted two weeks of the semester to PLCs. Chapter 14 provides some background of what a PLC is and what it is used for, a review of binary and octal arithmetic calculations, and discussion of the scanning cycle. The Allen Bradley PLC 5 is used as an example for discussing the programming commands, addressing schemes, and memory structure of PLCs. In this second edition, we have also included SLC 500 programming information. Much of the material would be similar for other PLCs and could be supplemented by PLC-specific information, such as addressing techniques.

Most helpful customer reviews

3 of 3 people found the following review helpful.
Lousy problems and examples
By A. Gossage
This is one of those books which features amazingly easy examples, then throws you into complex problems to solve on your own. Think of it as that professor who teaches you one thing, but puts something entirely new on a test to "see how much you've learned" when it's obvious you didn't learn what they didn't teach. The book also lacks answers to check your work. If you're unfamiliar with the topics being discussed, you have no clue if your answers are right or not. So, you crank through some problem, and find the answer to be

40megajoules. Great! So you turn to the back to verify your work and...nothing is there for verification...pretty lousy thing to do to students who are forced to take online classes with constant deadlines and little professor interaction. I only gave this book two stars since it does have some useful formulas.

0 of 0 people found the following review helpful.
I do not have any problem with the information presented ...
By K. Alexander
I do not have any problem with the information presented in this book. My problem is the book that I received is a knock off and I plan to contact the publisher to verify authenticity. The entire book looks as if the pages where Xeroxed and then cheaply bound.

0 of 0 people found the following review helpful.
Folded corners
By Brian Williams
The product advertised as new came with worn front and back covers. The binding is not broken. Paying $230 for a book to come in this condition is crazy.

See all 5 customer reviews...

ELECTRICAL POWER AND CONTROLS (2ND EDITION) BY TIMOTHY L. SKVARENINA, WILLIAM E. DEWITT PDF

Collect guide **Electrical Power And Controls (2nd Edition) By Timothy L. Skvarenina, William E. DeWitt** begin with currently. However the brand-new way is by gathering the soft data of guide Electrical Power And Controls (2nd Edition) By Timothy L. Skvarenina, William E. DeWitt Taking the soft data can be saved or saved in computer system or in your laptop. So, it can be more than a book Electrical Power And Controls (2nd Edition) By Timothy L. Skvarenina, William E. DeWitt that you have. The most convenient way to disclose is that you could likewise save the soft data of Electrical Power And Controls (2nd Edition) By Timothy L. Skvarenina, William E. DeWitt in your ideal and offered device. This problem will certainly mean you frequently read Electrical Power And Controls (2nd Edition) By Timothy L. Skvarenina, William E. DeWitt in the extra times more than talking or gossiping. It will not make you have bad habit, yet it will certainly lead you to have better behavior to review book Electrical Power And Controls (2nd Edition) By Timothy L. Skvarenina, William E. DeWitt.

From the Back Cover

This broadly-based book covers both motors and power transmission, and starts with the fundamentals of energy and power systems. It progresses though power quality transformers, motors/generators, power electronics, control devices/circuits, building electrical systems, and programmable logic controllers.

The second edition includes:

- Extensive use of figures and photos to reinforce concepts discussed in the text
- Additional review questions and problems at the end of most chapters
- New case studies on societal and global issues relating to engineering and technology
- Additional material to reflect changes in the industry

Since the first edition of this text, a number of events have occurred in the poi industry. Among them were the California energy crisis, the Enron Collapse, the Kyoto Protocol, and most recently, the August 14, 2003, blackout in the Northeaster United States and Ontario, Canada. In addition, the Accreditation Board for Engineering and Technology (ABET) has instituted new requirements for engineering and technology programs. Specifically, accredited programs must demonstrate that their graduates have u understanding of ethical responsibilities and a knowledge of societal and global issues as they relate to the practice of engineering and technology. This second edition includes several case studies relating to these issues that can help achieve the ABET outcomes. In addition, we have added new material and additional end-of-chapter problems throughout the text. Specific changes are described below.

As we noted in the first edition, communications, electronics, and power have converged to provide more efficient manufacturing processes for various types of industry Many motors are installed with electronic drives, programmable logic controllers are finding widespread application, and communications networks at the device, control, and information levels are used to monitor many industrial processes. Engineers and technologists today, and in the future, will require a broad background in all of these areas.

Unfortunately, the time available in the typical curriculum is fixed, and in some cases the number of hours required for a degree has decreased. Thus, like many electric power instructors, we have been confronted by pressures to eliminate the required power course from our electrical engineering technology curriculum in favor of something that is "more worthwhile" in the view of many of our colleagues. The challenge to us was to show the value that was added by our course for the majority of our graduates. Thus, we found it necessary to move away from a course that dealt almost exclusively with electric machines and transformer theory to one that includes the principles of operation and application of motors, motor controls, power quality, power electronics, motor circuit design, programmable logic controllers, arid other topics that a typical graduate might encounter in the workplace. As we developed our course, it became evident to us that there was no one text that covered all of the topics that we wanted to include. Thus, we-began writing our own text. Although this text was developed to support a one-semester sophomore course in electrical engineering technology, we have included much more material than could be covered in a single semester. This allows a great deal of flexibility in the design of a course using this text. This text uses primarily algebra and trigonometry for calculations and derivations; however, some calculus (primarily integrals) is used, particularly for Faraday's law. In general, the calculus can be skipped by those who have not had an introductory calculus course. Throughout the book we have made extensive use of figures and photos to reinforce the text discussion. We feel this is particularly important for today's traditional college students who are much more visually oriented and less inclined to read lengthy discussions. Recognizing the reluctance of students to read, we have included review questions at the end of most chapters in addition to problems. Assignment of questions can have a twofold benefit. First, it helps force the student to read the material, and second, it allows the incorporation of written assignments, which is emphasized by accreditation agencies and industry alike.

Although our course has a physics course as a prerequisite, we have found that the students often do not remember the concepts of force, torque, energy, and power and the relations among them. Thus, Chapter 1 presents a review of these basics, which allows us to introduce examples related to the electric power industry, such as pumped-water storage. By introducing the concept of energy storage in electric fields (capacitors) and magnetic fields (inductors), the student is prepared for the discussion of reactive power in Chapter 2. Chapter 1 also introduces the electric power system and discusses some of the current events, such as deregulation and the projected decline of nuclear generation. We have added three case studies at the end of Chapter 1. These address the Kyoto Protocol and global warming, the California electricity crisis, and the Enron collapse. These case studies can be used to help develop the student's sense of ethics and global perspectives. We typically cover the basic material in Chapter 1 with one to two lectures. Each case study can easily be the basis for a full class period.

We have modified and expanded Chapter 2, which provides a review of basic electric power calculations including a review of phasors and single-phase and three-phase electric power. The concepts of real, reactive, and apparent AC power are presented as they are used throughout the text. This chapter now covers these topics in more detail and does not assume that the student has seen the material in a previous course. Because our students have seen this material before, we cover the material quickly in two lectures. We have also added a power factor correction case study to Chapter 2, which provides a real-world example of the importance of a high power factor.

Due to the widespread use of electronics in the commercial and industrial workplaces, the issue of power quality has become extremely important. Every individual who uses electronic equipment contributes to the power quality problem. Thus, we believe that every electrical engineer and technologist should be aware of the problems caused by the equipment they or others use. In Chapter 3, we introduce the concept of power quality using the CBEMA-ITIC curve. This curve includes not only steady-state phenomena but also transients. Thus, we have included a discussion of transient voltage surge suppressors (TVSS) that can benefit every individual who wishes to provide protection for a personal computer, whether at home or in the workplace. We have also included a discussion of uninterruptible power supplies (UPSs), as the advertising for these devices is often short on facts and long on claims. The sections on TVSS and UPS devices have been rewritten to include the latest standards. The heart of Chapter 3, however, is the discussion of harmonics in the power system. The concept of harmonics is introduced here and is continued in later chapters when transformers, induction motors, and variable-speed drives are discussed.

Since one of the goals of our course is for the students to understand the operation of transformers and motors, some background in magnetic properties and materials is required. Chapter 4 introduces the concepts of flux, flux density, permeability, magnetic field intensity, reluctance, ferromagnetic materials, and losses due to hysteresis and eddy currents in magnetic materials. The emphasis is not to provide enough information for the students to become machine designers, but rather to give enough background so they can understand the principles of operation of the devices.

Chapter 5 introduces the first of the components of the power system—the transformer. The ideal transformer is introduced first and then the underlying assumptions are removed to produce an equivalent circuit for the transformer. Single-phase transformers are examined in detail, followed by a discussion of transformer bandwidth for electronics circuits, K-factor (harmonic) rated transformers, autotransformers, instrument transformers, and three-phase transformers. After the development of the transformer model, the topics are essentially independent, so the instructor can skip over sections that are not of interest. We have added several pictures to this chapter and additional emphasis on efficiency.

Because some instructors prefer to present AC machines before DC and others prefer the opposite, we have included Chapter 6 to develop the basic concepts of motor and generator operation for both types of machines. Chapter 6 can be followed by Chapter 7, "Three-Phase Induction Motors," Chapter 10, "The Synchronous Machine," or Chapter 11, "DC Machines," depending on the desires of the instructor or reader. Because we believe that most students will encounter AC machines in the workplace, we present the AC machine first in Chapter 6. The basic components of the synchronous machine are presented and the rotating magnetic field in the three-phase stator winding is developed in preparation for discussion of the induction motor. Following the AC machine, the DC machine is presented in a similar manner.

Chapter 7 presents the polyphase induction motor. The emphasis of this chapter is on practical, application-oriented material, beginning with the construction features and nameplate information and concluding with wiring diagrams and reduced-voltage. The equivalent circuit for the induction motor is developed for those who feel it is important; however, we typically skip over that section and use the equivalent circuit primarily to discuss the losses in the induction motor. Following the calculation of motor efficiency, the requirements of the National Energy Policy Act (NEPACT) of 1992 for the induction motor are discussed. Throughout the chapter, NEMA standards and requirements are discussed. This second edition includes a discussion of the NEMA-PremiumTM motor program and a case study of how one manufacturer found it economical to replace all of the motors in a plant.

Chapter 8 presents several types of single-phase induction motors and the universal motor. The primary emphasis of this chapter is understanding the differences in construction and performance of the various machines rather than mathematical analysis. Speed control of the shaded-pole induction motor by varying the number of turns in the stator windings is discussed.

Power electronics is an increasingly important topic due to the widespread use of variable-speed drives in industry. Chapter 9 begins with a discussion of a variety of solid-state power switches, including various types of diodes and transistors. This material is provided for completeness and to allow the practicing engineer/technologist to compare different technologies, and has been expanded from the first edition. Photos of the various devices are included to help the student understand what the devices look like.

However, depending on the preferences of the instructor or reader, that material could be omitted. Following the discussion of switching technologies, the variable-frequency AC motor drive is discussed with primary emphasis on the induction motor. The chapter concludes with discussions of stepper motors and brushless DC motors, which are becoming increasingly important. There is a new case study showing an industrial application of variable speed drives.

The synchronous machine is presented in detail in Chapter 10. Both round-rotor and salient-pole machines are discussed, although the primary emphasis is on the round-rotor case. Phasor diagrams are used extensively to illustrate the operation of the synchronous machine.

Chapter 11 begins with a discussion of the operation and construction of the DC machine, followed by a detailed discussion of commutation. Generator and motor operation of the various types of DC machines (series, shunt, compound) are presented, and the chapter concludes with a discussion of efficiency of the DC machine.

Motors must be started and stopped and that is normally done with a control system. Chapter 12 presents the basics of control systems. A variety of control devices—relays, switches, pilot devices, motor starters, contactors, etc.—are discussed followed by some basic considerations of ladder diagrams. Reduced-voltage starters and reversible starters for AC machines are presented followed by starters for DC motors. We have added a section on safety controls in Chapter 12 as machine safety is becoming very important in industry.

Following the presentation of motor starters and overload sensors in Chapter 12, Chapter 13 presents the fundamentals of power circuit design. The use of National Electric Code tables is emphasized in the design of motor circuits and voltage drop calculations. Programmable logic controllers (PLCs) are being used for a wide variety of applications in the commercial, industrial, and institutional markets. As an example of how widespread they have become, our university has installed micro-PLCs in many classrooms to control lighting levels via dimming ballasts on the fluorescent lights. As a result, we have devoted two weeks of the semester to PLCs. Chapter 14 provides some background of what a PLC is and what it is used for, a review of binary and octal arithmetic calculations, and discussion of the scanning cycle. The Allen Bradley PLC 5 is used as an example for discussing the programming commands, addressing schemes, and memory structure of PLCs. In this second edition, we have also included SLC 500 programming information. Much of the material would be similar for other PLCs and could be supplemented by PLC-specific information, such as addressing techniques.