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Design of Rotating Electrical Machines ELECTRICAL MACHINES Electrical Machines and Drives Electrical Machines with MATLAB®, Second Edition Advancements in Electric Machines Electrical Machines Electrical Machines Electrical Machines Electrical Machines Electrical Machines Electrical Machines-I Electrical Machines Electromagnetics for Electrical Machines Electrical Machines and Their Applications Principles of Electrical Machines A Textbook Of Electrical Machines Electrical Machine Drives Control Electrical Machines - I Design of Rotating Electrical Machines Practical Control of Electric Machines ELECTRICAL MACHINES : MODELLING AND ANALYSIS Worked Examples in Electrical Machines and Drives Electrical Machines Electrical Machines Principles Of Electrical Machine Design With Computer Programs, 2/E The Diagnosing of Troubles in Electrical Machines Electrical Machine Design Design of Electrical Machines Electrical Machine Drives Control Finite Element Analysis of Electrical Machines ELECTRICAL MACHINES Analysis of Electric Machinery and Drive Systems Multiphysics Simulation by Design for Electrical Machines, Power Electronics and Drives Basic Electrical Power and Machines Electrical machine design Electrical Machines Electrical Machines Electrical Machine Design Control of Electric Machine Drive Systems Control Of Electrical Machines

Design of Rotating Electrical Machines 2013-09-26

in one complete volume this essential reference presents an in depth overview of the theoretical principles and techniques of electrical machine design this timely new edition offers up to date theory and guidelines for the design of electrical machines taking into account recent advances in permanent magnet machines as well as synchronous reluctance machines new coverage includes brand new material on the ecological impact of the motors covering the eco design principles of rotating electrical machines an expanded section on the design of permanent magnet synchronous machines now reporting on the design of tooth coil high torque permanent magnet machines and their properties large updates and new material on synchronous reluctance machines air gap inductance losses in and resistivity of permanent magnets pm operating point of loaded pm circuit pm machine design and minimizing the losses in electrical machines end of chapter exercises and new direct design examples with methods and solutions to real design problems a supplementary website hosts two machine design examples created with mathcad rotor surface magnet permanent magnet machine and squirrel cage induction machine calculations also a matlab code for optimizing the design of an induction motor is provided outlining a step by step sequence of machine design this book enables electrical machine designers to design rotating electrical machines with a thorough treatment of all existing and emerging technologies in the field it is a useful manual for professionals working in the diagnosis of electrical machines and drives a rigorous introduction to the theoretical principles and techniques makes the book invaluable to senior electrical engineering students postgraduates researchers and university lecturers involved in electrical drives technology and electromechanical energy conversion

ELECTRICAL MACHINES 2017-11-01

this book covers a brief history of electricity fundamentals of electrostatic and electromagnetic fields torque generation magnetic circuits and detailed performance analysis of transformers and rotating machines it also discusses the concept of generalised machine which can emulate the dynamic and steady state performance of dc and ac machines to serve the specific applications of drive systems in industries many new types of motors are developed in the last few decades a separate chapter on special machines is included in this book so that the students should be made aware of these new developments the book covers the syllabi of many universities in india for a course in electrical machines therefore this book would serve the needs of the undergraduate students of electrical engineering

Electrical Machines and Drives 2018-01-20

this book aims to offer a thorough study and reference textbook on electrical machines and drives the basic idea is to start from the pure electromagnetic principles to derive the equivalent circuits and steady state equations of the most common electrical machines in the first parts although the book mainly concentrates on rotating field machines the first two chapters are devoted to transformers and dc commutator machines the chapter on transformers is included as an introduction to induction and synchronous machines their electromagnetics and equivalent circuits chapters three and four offer an in depth study of induction and synchronous machines respectively starting from their electromagnetics steady state equations and equivalent circuits are derived from which their basic properties can be deduced the second part discusses the main power electronic supplies for electrical drives for example rectifiers choppers cycloconverters and inverters much attention is paid to pwm techniques for inverters and the resulting harmonic content in the output waveform in the third part electrical drives are discussed combining the traditional rotating field and dc commutator electrical machines treated in the first part and the power electronics of part two field orientation of induction and synchronous machines are discussed in detail as well as direct torque control in addition also switched reluctance machines and stepping motors are discussed in the last chapters finally part 4 is devoted to the dynamics of traditional electrical machines also for the dynamics of induction and synchronous machine drives the electromagnetics are used as the starting point to derive the dynamic models throughout part 4 much attention is paid to the derivation of analytical models but of course the basic dynamic properties and probable causes of instability of induction and synchronous machine drives are discussed in detail as well with the derived models for stability in the small as starting point in addition to the study of the stability in the small a chapter is devoted to large scale dynamics as well e g sudden short circuit of synchronous machines the textbook is used as the course text for the bachelor s and master s programme in electrical and mechanical engineering at the faculty of engineering and architecture of ghent university parts 1 and 2 are taught in the basic course fundamentals of electric drives in the third bachelor part 3 is used for the course

controlled electrical drives in the first master while part 4 is used in the specialised master on electrical energy

Electrical Machines with MATLAB®, Second Edition 2011-11-16

electrical machines with matlab encapsulates the invaluable insight and experience that eminent instructor turan gönen has acquired in almost 40 years of teaching with simple versatile content that separates it from other texts on electrical machines this book is an ideal self study tool for advanced students in electrical and other areas of engineering in response to the often inadequate rushed coverage of fundamentals in most basic circuit analysis books and courses this resource is intelligently designed easy to read and packed with in depth information on crucial concepts topics include three phase circuits power measurement in ac circuits magnetic circuits transformers and induction synchronous and direct current machines the book starts by reviewing more basic concepts with numerous examples to clarify their application it then explores new buzzword topics and developments in the area of electrical machine applications and electric power systems including renewable energy wind energy and related conversion solar energy energy storage the smart grid using international systems is units throughout this cross disciplinary design guide delves into commonly used vocabulary and symbols associated with electrical machinery several new appendices contain tools such as an extensive glossary to explain important terms outlining a wide range of information and the many different ways to apply it this book is an invaluable multifunctional resource for students and professors as well as practicing professionals looking to refresh and update their knowledge

Advancements in Electric Machines 2008-11-14

traditionally electrical machines are classified into d c commutator brushed machines induction asynchronous machines and synchronous machines these three types of electrical machines are still regarded in many academic curricula as fundamental types despite that d c brushed machines except small machines have been gradually abandoned and pm brushless machines pmbm and switched reluctance machines srm have been in mass production and use for at least two decades recently new topologies of high torque density motors high speed motors integrated motor drives and special motors have been developed progress in electric machines technology is stimulated by new materials new areas of applications impact of power electronics need for energy saving and new technological challenges the development of electric machines in the next few years will mostly be stimulated by computer hardware residential and public applications and transportation systems land sea and air at many universities teaching and research strategy oriented towards electrical machinery is not up to date and has not been changed in some countries almost since the end of the wwii in spite of many excellent academic research achievements the academia industry collaboration and technology transfer are underestimated or quite often neglected underestimation of the role of industry unfamiliarity with new trends and restraint from technology transfer results with time in lack of external financial support and drastic decline in the number of students interested in power electrical engineering

Electrical Machines 2017-11-24

offers key concepts of electrical machines embedded with solved examples review questions illustrations and open book questions

Electrical Machines 2012-10-26

electrical machines primarily covers the basic functionality and the role of electrical machines in their typical applications the effort of applying coordinate transforms is justified by obtaining a more intuitive concise and easy to use model in this textbook mathematics is reduced to a necessary minimum and priority is given to bringing up the system view and explaining the use and external characteristics of machines on their electrical and mechanical ports covering the most relevant concepts relating to machine size torque and power the author explains the losses and secondary effects outlining cases and conditions in which some secondary phenomena are neglected while the goal of developing and using machine mathematical models equivalent circuits and mechanical characteristics persists through the book the focus is kept on physical insight of electromechanical conversion process details such as the slot shape and the disposition of permanent magnets and their effects on the machine parameters and performance are also covered

Electrical Machines 2020-06-08

electrical machines covers the theoretical and mathematical concepts of the most commonly used electrical machines in industry and home appliances this book presents the practical usage and functioning of electrical machines in a way which is easily understandable by the readers it provides a different approach from other books and presents a step by step procedure on how to start and run the machine on various load operating and testing conditions and connections it also presents a complete set of readings calculations and graphs plots performed on standard electrical machines with rated voltage and current each chapter contains answers to questions related to particular machines and testing conditions operations solutions to numerical problems and some exercise problems for practice

Electrical Machines 2016-10-14

this book endeavors to break the stereotype that basic electrical machine courses are limited only to transformers dc brush machines induction machines and wound field synchronous machines it is intended to serve as a textbook for basic courses on electrical machines covering the fundamentals of the electromechanical energy conversion transformers classical electrical machines i e dc brush machines induction machines wound field rotor synchronous machines and modern electrical machines i e switched reluctance machines srm and permanent magnet pm brushless machines in addition to academic research and teaching the author has worked for over 18 years in us high technology corporative businesses providing solutions to problems such as design simulation manufacturing and laboratory testing of large variety of electrical machines for electric traction energy generation marine propulsion and aerospace electric systems

Electrical Machines 2011

this book is written so that it serves as a text book for b e b tech degree students in general and for the institutions where aicte model curriculum has been adopted topics covered in this book magnetic field and magnetic circuit electromagnetic force and torque d c machines d c machines motoring and generation salient features self contained self explanatory and simple to follow text numerous worked out examples well explained theory parts with illustrations exercises objective type question with answers at the end of each chapter

Electrical Machines-I 2017-11-24

an extensive and easy to read guide covering the fundamental concepts of electrical machines highlighting transformers motors generators and magnetic circuits it provides in depth discussion on construction working principles and applications of various electrical machines the design of transformers functioning of generators and performance of induction motors are explained through descriptive illustrations step by step solved examples and mathematical derivations a separate chapter on special purpose machines offers important topics such as servomotors brushless motors and stepper motors which is useful from industrial perspective to build a customized machine supported by 400 solved examples 600 figures and more than 1000 self assessment exercises this is an ideal text for one or two semester undergraduate courses on electrical machines under electrical and electronics engineering

Electrical Machines 2018-10-08

electromagnetics for electrical machines offers a comprehensive yet accessible treatment of the linear theory of electromagnetics and its application to the design of electrical machines leveraging valuable classroom insight gained by the authors during their impressive and ongoing teaching careers this text emphasizes concepts rather than numerical methods providing presentation project problems at the end of each chapter to enhance subject knowledge highlighting the essence of electromagnetic field emf theory and its correlation with electrical machines this book reviews maxwell s equations and scalar and vector potentials describes the special cases leading to the laplace poisson s eddy current

and wave equations explores the utility of the uniqueness generalized poynting helmholtz and approximation theorems discusses the schwarz christoffel transformation as well as the determination of airgap permeance addresses the skin effects in circular conductors and eddy currents in solid and laminated iron cores contains examples relating to the slot leakage inductance of rotating electrical machines transformer leakage inductance and theory of hysteresis machines presents analyses of emfs in laminated rotor induction machines three dimensional field analyses for three phase solid rotor induction machines and more electromagnetics for electrical machines makes an ideal text for postgraduate level students of electrical engineering as well as of physics and electronics and communication engineering it is also a useful reference for research scholars concerned with problems involving electromagnetics

Electromagnetics for Electrical Machines 1984

a self contained comprehensive and unified treatment of electrical machines including consideration of their control characteristics in both conventional and semiconductor switched circuits this new edition has been expanded and updated to include material which reflects current thinking and practice all references have been updated to conform to the latest national bs and international iec recommendations and a new appendix has been added which deals more fully with the theory of permanent magnets recognising the growing importance of permanent magnet machines the text is so arranged that selections can be made from it to give a short course for non specialists while the book as a whole will prepare students for more advanced studies in power systems control systems electrical machine design and general industrial applications includes numerous worked examples and tutorial problems with answers

Electrical Machines and Their Applications 2008

for over 15 years principles of electrical machines is an ideal text for students who look to gain a current and clear understanding of the subject as all theories and concepts are explained with lucidity and clarity succinctly divided in 14 chapters the book delves into important concepts of the subject which include armature reaction and commutation single phase motors three phase induction motors synchronous motors transformers and alternators with the help of numerous figures and supporting chapter end questions for retention

Principles of Electrical Machines 2016-10-10

this is a single volume book on electrical machines that teaches the subject precisely and yet with amazing clarity the extent has been kept in control so that the entire subject can be covered by students within the limited time of the semesters thus they will not have to consult multiple books anymore the discussions of concepts include the modern trends used in industry like efficient transformers efficient induction motors dc drives and the problems related to them

A Textbook Of Electrical Machines 2020-11-01

this comprehensive text examines existing and emerging electrical drive technologies the authors clearly define the most basic electrical drive concepts and go on to explain the most important details while maintaining a solid connection to the theory and design of the associated electrical machines also including links to a number of industrial applications the authors take their investigation of electrical drives beyond theory to examine a number of practical aspects of electrical drive control and application key features provides a comprehensive summary of all aspects of controlled speed electrical drive technology including control and operation handling of electrical drives is solidly linked to the theory and design of the associated electrical machines added insight into problems and functions are illustrated with clearly understandable figures offers an understanding of the main phenomena associated with electrical machine drives considers the problem of bearing currents and voltage stresses of an electrical drive includes up to date theory and design guidelines taking into account the most recent advances this book s rigorous coverage of theoretical principles and techniques makes for an excellent introduction to controlled speed electrical drive technologies for electrical engineering msc or phd students studying electrical drives it also serves as an excellent reference for practicing electrical

engineers looking to carry out design analyses and development of controlled speed electrical drives

Electrical Machine Drives Control 2013-12-31

the importance of various electrical machines is well known in the various engineering fields the book provides comprehensive coverage of the magnetic circuits magnetic materials single and three phase transformers and d c machines the book is structured to cover the key aspects of the course electrical machines i the book starts with the explanation of basics of magnetic circuits concepts of self and mutual inductances and important magnetic materials then it explains the fundamentals of single phase transformers including the construction phasor diagram equivalent circuit losses efficiency methods of cooling parallel operation and autotransformer the chapter on three phase transformer provides the detailed discussion of construction connections phasor groups parallel operation tap changing transformer and three winding transformer the various testing methods of transformers are also incorporated in the book the book further explains the concept of electromechanical energy conversion including the discussion of singly and multiple excited systems then the book covers all the details of d c generators including construction armature reaction commutation characteristics parallel operation and applications the book also includes the details of d c motors such as characteristics types of starters speed control methods electric braking and permanent magnet d c motors finally the book covers the various testing methods of d c machines including swinburne s test brake test retardation test and hopkinson s test the book uses plain lucid language to explain each topic the book provides the logical method of explaining the various complicated topics and stepwise methods to make the understanding easy each chapter is well supported with necessary illustrations self explanatory diagrams and variety of solved problems all the chapters are arranged in a proper sequence that permits each topic to build upon earlier studies the book explains the philosophy of the subject which makes the understanding of the concepts very clear and makes the subject more interesting

Electrical Machines - I 2020-03-20

in one complete volume this essential reference presents an in depth overview of the theoretical principles and techniques of electrical machine design this timely new edition offers up to date theory and guidelines for the design of electrical machines taking into account recent advances in permanent magnet machines as well as synchronous reluctance machines new coverage includes brand new material on the ecological impact of the motors covering the eco design principles of rotating electrical machines an expanded section on the design of permanent magnet synchronous machines now reporting on the design of tooth coil high torque permanent magnet machines and their properties large updates and new material on synchronous reluctance machines air gap inductance losses in and resistivity of permanent magnets pm operating point of loaded pm circuit pm machine design and minimizing the losses in electrical machines end of chapter exercises and new direct design examples with methods and solutions to real design problems a supplementary website hosts two machine design examples created with mathcad rotor surface magnet permanent magnet machine and squirrel cage induction machine calculations also a matlab code for optimizing the design of an induction motor is provided outlining a step by step sequence of machine design this book enables electrical machine designers to design rotating electrical machines with a thorough treatment of all existing and emerging technologies in the field it is a useful manual for professionals working in the diagnosis of electrical machines and drives a rigorous introduction to the theoretical principles and techniques makes the book invaluable to senior electrical engineering students postgraduates researchers and university lecturers involved in electrical drives technology and electromechanical energy conversion

Design of Rotating Electrical Machines 2016-05-12

this book presents deep analysis of machine control for different applications focusing on its implementation in embedded systems necessary peripherals for various microcontroller families are analysed for machine control and software architecture patterns for high quality software development processes in motor control units are described abundant figures help the reader to understand the theoretical simulation and practical implementation stages of machine control model based design used as a mathematical and visual approach to construction of complex control algorithms code generation that eliminates hand coding errors and co simulation tools such as simulink psim and finite element analysis are discussed the simulation and verification tools refine and retest the models without having to resort to prototype construction the book shows how a voltage source inverter can be

designed with tricks protection elements and space vector modulation practical control of electric machines model based design and simulation is based on the author s experience of a wide variety of systems in domestic automotive and industrial environments and most examples have implemented and verified controls the text is ideal for readers looking for an insight into how electric machines play an important role in most real life applications of control practitioners and students preparing for a career in control design applied in electric machines will benefit from the book s easily understood theoretical approach to complex machine control the book contains mathematics appropriate to various levels of experience from the student to the academic and the experienced professional advances in industrial control reports and encourages the transfer of technology in control engineering the rapid development of control technology has an impact on all areas of the control discipline the series offers an opportunity for researchers to present an extended exposition of new work in all aspects of industrial control

Practical Control of Electric Machines 2013-10-22

the book is designed to cover the study of electro mechanical energy converters in all relevant aspects and also to acquaint oneself of a single treatment for all types of machines for modelling and analysis the book starts with the general concepts of energy conversion and basic circuit elements followed by a review of the mathematical tools the discussion goes on to introduce the concepts of energy storage in magnetic field electrical circuits used in rotary electro mechanical devices and three phase systems with their transformation the book further makes the reader familiar with the modern aspects of analysis of machines like transient and dynamic operation of machines asymmetrical and unbalanced operation of poly phase induction machines and finally gives a brief exposure to space phasor concepts

ELECTRICAL MACHINES : MODELLING AND ANALYSIS 2014-09-17

worked examples in electrical machines and drives discusses methods in predicting and explaining electromechanical performance of several devices the book is comprised of seven chapters that sequence the examples at increasing levels of difficulty chapter 1 provides an introduction and reviews the basic theories the second chapter covers transformers and the third chapter tackles d c machines chapter 4 is concerned with induction machines while chapter 5 deals with synchronous machines chapter 6 covers transient behavior and chapter 7 talks about power electronic electrical machine drives the book will be of great use to students and instructors of schools concerned with electronic devices such as in electrical engineering and can help enrich their lectures and practical classes

Worked Examples in Electrical Machines and Drives 2012

electrical machines and drives play a vital role in industry with an ever increasing importance this fact necessitates the understanding of machine and drive principles by engineers of many different disciplines therefore this book is intended to give a comprehensive deduction of these principles special attention is given to the precise mathematical deduction of the necessary formulae to calculate machines and drives and to the discussion of simplifications if applied with the associated limits so the book shows how the different machine topologies can be deduced from general fundamentals and how they are linked this book addresses graduate students researchers and developers of electrical machines and drives who are interested in getting knowledge about the principles of machine and drive operation and in detecting the mathematical and engineering specialties of the different machine and drive topologies together with their mutual links the detailed but compact mathematical deduction together with a distinct emphasis onto assumptions simplifications and the associated limits leads to a clear understanding of electrical machine and drive topologies and characteristics

Electrical Machines 2006

this fully revised second edition of electrical machines is systematically organized as per the logical flow of the topics included in electrical machines courses in universities across india it is written as a text cum guide so that the underlying principles can be readily understood and is useful to both the novice as well as advanced readers emphasis has been

laid on physical understanding and pedagogical aspects of the subject in addition to conventional machines the book's extensive coverage also includes rigorous treatment of transformers current potential and welding transformers special machines ac dc servomotors linear induction motors permanent magnet dc motors and application of thyristors in rotating machines

Electrical Machines 1921

the book gives comprehensive treatment to the principles of electrical machine design it is concise and up to date with special emphasis on the computerised design it has been prepared specifically for engineering college teachers and students and practising engineers to enable them to appreciate the salient aspects of electrical machine design with reference to computer applications computer programs on small problems written in fortran and c language have been added to guide the readers contents basic considerations heating and cooling main dimensions magnetic circuit calculations electric circuit calculations design of transformer design of rotating machines finite element method computer programs in c language appendices index

Principles Of Electrical Machine Design With Computer Programs, 2/E 1926

this comprehensive text examines existing and emerging electrical drive technologies the authors clearly define the most basic electrical drive concepts and go on to explain the most important details while maintaining a solid connection to the theory and design of the associated electrical machines also including links to a number of industrial applications the authors take their investigation of electrical drives beyond theory to examine a number of practical aspects of electrical drive control and application key features provides a comprehensive summary of all aspects of controlled speed electrical drive technology including control and operation handling of electrical drives is solidly linked to the theory and design of the associated electrical machines added insight into problems and functions are illustrated with clearly understandable figures offers an understanding of the main phenomena associated with electrical machine drives considers the problem of bearing currents and voltage stresses of an electrical drive includes up to date theory and design guidelines taking into account the most recent advances this book's rigorous coverage of theoretical principles and techniques makes for an excellent introduction to controlled speed electrical drive technologies for electrical engineering msc or phd students studying electrical drives it also serves as an excellent reference for practicing electrical engineers looking to carry out design analyses and development of controlled speed electrical drives

The Diagnosing of Troubles in Electrical Machines 2011-07

in finite element analysis of electrical machines the author covers two dimensional analysis emphasizing the use of finite elements to perform the most common calculations required of machine designers and analysts the book explains what is inside a finite element program and how the finite element method can be used to determine the behavior of electrical machines the material is tutorial and includes several completely worked out examples the main illustrative examples are synchronous and induction machines the methods described have been used successfully in the design and analysis of most types of rotating and linear machines audience a valuable reference source for academic researchers practitioners and designers of electrical machinery

Electrical Machine Design 2016-11-14

this comprehensive up to date introduction to electrical machines is designed to meet the needs of undergraduate electrical engineering students it presents the essential principles of rotating machines and transformers the emphasis is on the performance though the book also introduces the salient features of electrical machine design the book provides accessible student friendly coverage of dc machines transformers three phase induction motor single phase induction motor fractional horsepower motors and synchronous machines the clear writing style of the book enhanced by illustrative figures and simplified explanations of the fundamentals makes it an ideal text for gaining a thorough

understanding of the subject of electrical machines key features include detailed coverage of the construction of electrical machines lucid explanations of the principles of operation of electrical machines methods of testing of electrical machines performance calculations of electrical machines wealth of diverse solved examples in each chapter to illustrate the application of theory to practical problems salient features of design of electrical machines objective type questions to help students prepare for competitive exams

Design of Electrical Machines 2012-12-06

introducing a new edition of the popular reference on machine analysis now in a fully revised and expanded edition this widely used reference on machine analysis boasts many changes designed to address the varied needs of engineers in the electric machinery electric drives and electric power industries the authors draw on their own extensive research efforts bringing all topics up to date and outlining a variety of new approaches they have developed over the past decade focusing on reference frame theory that has been at the core of this work since the first edition this volume goes a step further introducing new material relevant to machine design along with numerous techniques for making the derivation of equations more direct and easy to use coverage includes completely new chapters on winding functions and machine design that add a significant dimension not found in any other text a new formulation of machine equations for improving analysis and modeling of machines coupled to power electronic circuits simplified techniques throughout from the derivation of torque equations and synchronous machine analysis to the analysis of unbalanced operation a unique generalized approach to machine parameters identification a first rate resource for engineers wishing to master cutting edge techniques for machine analysis analysis of electric machinery and drive systems is also a highly useful guide for students in the field

Electrical Machine Drives Control 2007-09-27

presents applied theory and advanced simulation techniques for electric machines and drives this book combines the knowledge of experts from both academia and the software industry to present theories of multiphysics simulation by design for electrical machines power electronics and drives the comprehensive design approach described within supports new applications required by technologies sustaining high drive efficiency the highlighted framework considers the electric machine at the heart of the entire electric drive the book also emphasizes the simulation by design concept a concept that frames the entire highlighted design methodology which is described and illustrated by various advanced simulation technologies multiphysics simulation by design for electrical machines power electronics and drives begins with the basics of electrical machine design and manufacturing tolerances it also discusses fundamental aspects of the state of the art design process and includes examples from industrial practice it explains fem based analysis techniques for electrical machine design providing details on how it can be employed in ansys maxwell software in addition the book covers advanced magnetic material modeling capabilities employed in numerical computation thermal analysis automated optimization for electric machines and power electronics and drive systems this valuable resource delivers the multi physics know how based on practical electric machine design methodologies provides an extensive overview of electric machine design optimization and its integration with power electronics and drives incorporates case studies from industrial practice and research and development projects multiphysics simulation by design for electrical machines power electronics and drives is an incredibly helpful book for design engineers application and system engineers and technical professionals it will also benefit graduate engineering students with a strong interest in electric machines and drives

Finite Element Analysis of Electrical Machines 2013-06-17

the book covers in a clear and concise manner all aspects of electrical machines the text is introductory in nature and the emphasis is on machines as part of systems rather than the detail of the machines themselves much attention is paid to the applications of the machines

ELECTRICAL MACHINES 2017-11-20

this book includes my lecture notes for electrical machines course the book is divided to different learning parts part 1 apply basic physical concepts to explain the operation and solve problems related to electrical machines part 2 explain the principles underlying the performance of three phase electrical machines part 3 analyse operate and test three phase induction machines part 4 investigate the performance design operation and testing of the three phase synchronous machine part1 apply basic physical concepts to explain the operation and solve problems related to electrical machines describe the construction of simple magnetic circuits both with and without an air gap explain the basic laws which govern the electrical machine operation such as faraday s law ampere biot savart s law and lenz s law apply faraday s law of electromagnetic induction ampere biot savart s law and lenz s law to solve for induced voltage and currents in relation to simple magnetic circuits with movable parts illustrate the principle of the electromechanical energy conversion in magnetic circuits with movable parts part 2 explain the principles underlying the performance of three phase electrical machines compare and contrast concentric and distributed windings in three phase electrical machines identify the advantages of distributed windings applied to three phase machines explain how the pulsating and rotating magnetic fields are produced in distributed windings calculate the synchronous speed of a machine based on its number of poles and frequency of the supply describe the process of torque production in multi phase machines part 3 analyse operate and test three phase induction machines calculate the slip of an induction machine given the operating and synchronous speeds calculate and compare between different torques of a three phase induction machine such as the locked rotor or starting torque pull up torque breakdown torque full load torque or braking torque develop and manipulate the equivalent circuit model for the three phase induction machine analyse and test experimentally the torque speed and current speed characteristics of induction machines and discuss the effects of varying such motor parameters as rotor resistance supply voltage and supply frequency on motor torque speed characteristics perform no load and blocked rotor tests in order to determine the equivalent circuit parameters of an induction machine explore various techniques to start an induction motor identify the applications of the three phase induction machines in industry and utility classify the insulations implemented in electrical machines windings and identify the factors affecting them part4 investigate the performance design operation and testing of the three phase synchronous machine describe the construction of three phase synchronous machines particularly the rotor stator windings and the rotor saliency develop and manipulate an equivalent circuit model for the three phase synchronous machine sketch the phasor diagram of a non salient poles synchronous machine operating at various modes operation such as no load operation motor operation and generator operation investigate the influence of the rotor saliency on machine performance perform open and short circuit tests in order to determine the equivalent circuit parameters of a synchronous machine identify the applications of the three phase synchronous machines in industry and utility list and explain the conditions of parallel operation of a group of synchronous generators evaluate the performance of the synchronous condenser and describe the power flow control between a synchronous condenser and the utility in both modes over and under excited explain the principles of controlling the output voltage and frequency of a synchronous generator

Analysis of Electric Machinery and Drive Systems 1994-03-31

a unique approach to sensorless control and regulator design of electric drives based on the author s vast industry experience and collaborative works with other industries control of electric machine drive systems is packed with tested implemented and verified ideas that engineers can apply to everyday problems in the field originally published in korean as a textbook this highly practical updated version features the latest information on the control of electric machines and apparatus as well as a new chapter on sensorless control of ac machines a topic not covered in any other publication the book begins by explaining the features of the electric drive system and trends of development in related technologies as well as the basic structure and operation principles of the electric machine it also addresses steady state characteristics and control of the machines and the transformation of physical variables of ac machines using reference frame theory in order to provide a proper foundation for the material the heart of the book reviews several control algorithms of electric machines and power converters explaining active damping and how to regulate current speed and position in a feedback manner seung ki sul introduces tricks to enhance the control performance of the electric machines and the algorithm to detect the phase angle of an ac source and to control dc link voltages of power converters topics also covered are vector control control algorithms for position speed sensorless drive of ac machines methods for identifying the parameters of electric machines and power converters the matrix algebra to model a three phase ac machine in d q n axes every chapter features exercise problems drawn from actual industry experience the book also includes more than 300 figures and offers access to an ftp site which provides matlab programs for selected problems the book s practicality and realworld relatability make it an invaluable resource

for professionals and engineers involved in the research and development of electric machine drive business industrial drive designers and senior undergraduate and graduate students to obtain instructor materials please send an email to pressbooks.ieee.org to visit this book's ftp site to download matlab codes please click on this link ftp://ftp.wiley.com/public/sci_tech_med/electric_machine/matlab_codes are also downloadable from wiley booksupport site at booksupport.wiley.com

Multiphysics Simulation by Design for Electrical Machines, Power Electronics and Drives 1926

Basic Electrical Power and Machines 2020-04-01

Electrical machine design 1986

Electrical Machines 1913

Electrical Machines 2011-04-20

Electrical Machine Design

Control of Electric Machine Drive Systems

Control Of Electrical Machines