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# Nptel Electrical Machine Design

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Digital Design  
Electric and Hybrid Vehicles  
Networks and Systems  
Embedded System Design  
With an Introduction to the Verilog HDL  
Reliability Characterisation of Electrical and  
Electronic Systems  
A Unified Hardware/Software Introduction  
VLSI Architecture  
Electric Powertrain  
Wheeled Mobile Robotics  
Intelligent Mechatronic Systems  
Electrical Machine and Drive (Introduce to  
Advance Control)  
Electrical Machines-I  
Modern Electric, Hybrid Electric, and Fuel Cell  
Vehicles, Third Edition  
Brushless Permanent-magnet and Reluctance  
Motor Drives  
Heat & Mass Transfer 2E  
Computer Organization  
Switched Reluctance Motor Drives  
The Twelve Principles of Efficiency  
Control Systems  
A Brief History of Mechanical Engineering  
Blockchain Technology  
Engineers Black Book

Renewable Energy in Marine Environment  
Innovative Modeling Techniques  
From Fundamentals Towards Autonomous  
Systems  
Classical, Modern, and AI-Based Approaches  
Power System Stability and Control  
Modeling, Simulation, Analysis, Design, and  
Applications  
Fundamentals, Applications, and Case Studies  
Modeling, Control and Diagnosis  
Artificial Intelligence and Machine Learning for  
EDGE Computing  
SPECIAL ELECTRICAL MACHINES  
Design, Technology, and Diagnostics, Second  
Edition  
Electromagnetic Modeling by Finite Element  
Methods  
Design of Brushless Permanent-magnet Machines  
Stepping Motors and Their Microprocessor  
Controls  
Performance & Design A.C. Machines  
Introduction to IoT

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**ARIANA DEVAN**

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*Digital Design* Springer  
"With new examples  
and the incorporation  
of MATLAB problems,

the fourth edition gives  
comprehensive  
coverage of topics not  
found in any other  
texts." (Midwest).  
*Electric and Hybrid  
Vehicles* Elsevier  
Brushless permanent-  
magnet motors provide

simple, low maintenance, and easily controlled mechanical power. Written by two leading experts on the subject, this book offers the most comprehensive guide to the design and performance of brushless permanent-magnetic motors ever written. Topics range from electrical and magnetic design to materials and control. Throughout, the authors stress both practical and theoretical aspects of the subject, and relate the material to modern software-based techniques for design and analysis. As new magnetic materials and digital power control techniques continue to widen the scope of the applicability of such motors, the need for an

authoritative overview of the subject becomes ever more urgent. *Design of Brushless Permanent-Magnet Motors* fits the bill and will be read by students and researchers in electric and electronic engineering.

*Networks and Systems*  
John Wiley & Sons

What is mechanical engineering? What a mechanical engineering does? How did the mechanical engineering change through ages? What is the future of mechanical engineering? This book answers these questions in a lucid manner. It also provides a brief chronological history of landmark events and answers questions such as: When was steam engine

invented? Where was first CNC machine developed? When did the era of additive manufacturing start? When did the marriage of mechanical and electronics give birth to discipline of mechatronics? This book informs and create interest on mechanical engineering in the general public and particular in students. It also helps to sensitize the engineering fraternity about the historical aspects of engineering. At the same time, it provides a common sense knowledge of mechanical engineering in a handy manner.

**Embedded System Design** Springer

Science & Business Media

This book introduces a

modern approach to embedded system design, presenting software design and hardware design in a unified manner. It covers trends and challenges, introduces the design and use of single-purpose processors ("hardware") and general-purpose processors ("software"), describes memories and buses, illustrates hardware/software tradeoffs using a digital camera example, and discusses advanced computation models, controls systems, chip technologies, and modern design tools. For courses found in EE, CS and other engineering departments.

With an Introduction to the Verilog HDL CRC Press

Updated with the latest developments and advances, the second edition of The Electric Power Engineering Handbook has grown so much that it is now presented as a set of five books. Now this authoritative coverage is available in easily digestible portions that are tightly focused and conveniently sized. Completing the set, Power System Stability and Control outlines the dynamics, operational aspects, and protection issues of power systems related to stability and control. In addition to updates and revisions throughout the chapters, it includes new sections in the areas of small signal stabilit.

Reliability

Characterisation of Electrical and

Electronic Systems

CRC Press

From the fan motor in your PC to precision control of aircraft, electrical machines of all sizes, varieties, and levels of complexity permeate our world. Some are very simple, while others require exacting and application-specific design. Electrical Machine Analysis Using Finite Elements provides the tools necessary for the analysis and design of any type of electrical machine by integrating mathematical/numerical techniques with analytical and design methodologies. Building successively from simple to complex analyses, this book leads you step-by-step through the procedures and illustrates their implementation with

examples of both traditional and innovative machines. Although the examples are of specific devices, they demonstrate how the procedures apply to any type of electrical machine, introducing a preliminary theory followed by various considerations for the unique circumstance. The author presents the mathematical background underlying the analysis, but emphasizes application of the techniques, common strategies, and obtained results. He also supplies codes for simple algorithms and reveals analytical methodologies that universally apply to any software program. With step-by-step coverage of the fundamentals and common procedures,

Electrical Machine Analysis Using Finite Elements offers a superior analytical framework that allows you to adapt to any electrical machine, to any software platform, and to any specific requirements that you may encounter.

**A Unified Hardware/Software Introduction** New

York ; Toronto : McGraw-Hill

The switched reluctance machine (SRM) is the least expensive electrical machine to produce, yet one of the most reliable. As such, research has blossomed during the last decade, and the SRM and variable drive systems using SRMs are receiving considerable attention from industry. Because they require a power

electronic converter and controller to function, however, successful realization of an SRM variable drive system demands an understanding of the converter and controller subsystems and their integration with the machine. Switched Reluctance Motor Drives provides that understanding. It presents a unified view of the machine and its drive system from all of its system and subsystem aspects. With a careful balance of theory and implementation, the author develops the analysis and design of SRMs from first principles, introduces a wide variety of power converters available for driving the SRM, and systematically presents both low- and high-performance

controllers. The book includes an in-depth study of acoustic noise and its minimization along with application examples that include comparisons between ac and dc drives and SRM drive. The result is the first book that provides a state-of-the-art knowledge of SRMs, power converters, and their use with both sensor-based and sensorless controllers. Switched Reluctance Motor Drives enables both students and engineers to learn all aspects of SRM drive systems and appreciate the interdependence of the various subsystems in performance optimization. *VLSI Architecture* Asian Development Bank This handbook serves as a guide to deploying battery energy storage

technologies, specifically for distributed energy resources and flexibility resources. Battery energy storage technology is the most promising, rapidly developed technology as it provides higher efficiency and ease of control. With energy transition through decarbonization and decentralization, energy storage plays a significant role to enhance grid efficiency by alleviating volatility from demand and supply. Energy storage also contributes to the grid integration of renewable energy and promotion of microgrid. Academic Press

Revised extensively and updated with several new topics, this book discusses the principles and applications of "Heat

and Mass Transfer". It is written with extensive pedagogy, clear explanations and examples throughout to elucidate the concepts and facilitate problem solving.

**Electric Powertrain**  
CRC Press

The book deals with the fundamentals, theoretical bases, and design methodologies of conventional internal combustion engine (ICE) vehicles, electric vehicles (EVs), hybrid electric vehicles (HEVs), and fuel cell vehicles (FCVs). The design methodology is described in mathematical terms, step-by-step, and the topics are approached from the overall drive train system, not just individual components. Furthermore, in explaining the design methodology of each



drive train, design examples are presented with simulation results.

*Wheeled Mobile Robotics* Prentice Hall

This book covers the complete syllabi prescribed for undergraduate courses in electrical, electronics, mechanical and instrumentation engineering offered by various Indian universities. The objective of this text is to provide thorough knowledge in the emerging field of special electrical machines. It discusses the stepper motor, switched reluctance motor, permanent magnet dc and ac motors, brushless dc motors, single phase special electric motors, servomotors, linear electric machines and permanent magnet

axial flux machines.

Key Features • Chapter on permanent magnet axial flux machines (not available in other Indian authors' books)

- Numerous worked-out examples
- Based on classroom tested materials
- Simplified mathematical analysis

Besides undergraduate students, the book will also be useful to the postgraduate students specialising in drives and control, power electronics, control systems and mechatronics.

Intelligent Mechatronic Systems Lulu.com

Control Systems: Classical, Modern, and AI-Based Approaches provides a broad and comprehensive study of the principles, mathematics, and applications for those studying basic control in mechanical,

electrical, aerospace, and other engineering disciplines. The text builds a strong mathematical foundation of control theory of linear, nonlinear, optimal, model predictive, robust, digital, and adaptive control systems, and it addresses applications in several emerging areas, such as aircraft, electro-mechanical, and some nonengineering systems: DC motor control, steel beam thickness control, drum boiler, motion control system, chemical reactor, head-disk assembly, pitch control of an aircraft, yaw-damper control, helicopter control, and tidal power control. Decentralized control, game-theoretic control, and control of hybrid

systems are discussed. Also, control systems based on artificial neural networks, fuzzy logic, and genetic algorithms, termed as AI-based systems are studied and analyzed with applications such as auto-landing aircraft, industrial process control, active suspension system, fuzzy gain scheduling, PID control, and adaptive neuro control. Numerical coverage with MATLAB® is integrated, and numerous examples and exercises are included for each chapter. Associated MATLAB® code will be made available. Electrical Machine and Drive (Introduce to Advance Control) Elsevier  
The book provides a comprehensive coverage of different

aspects of low power circuit synthesis at various levels of design hierarchy; starting from the layout level to the system level. For a seamless understanding of the subject, basics of MOS circuits has been introduced at transistor, gate and circuit level; followed by various low-power design methodologies, such as supply voltage scaling, switched capacitance minimization techniques and leakage power minimization approaches. The content of this book will prove useful to students, researchers, as well as practicing engineers.

*Electrical Machines-I*  
MDPI

Unlike any other source in the field, this

valuable reference clearly examines key aspects of the finite element method (FEM) for electromagnetic analysis of low-frequency electrical devices. The authors examine phenomena such as nonlinearity, mechanical force, electrical circuit coupling, vibration, heat, and movement for applications in the elect

**Modern Electric, Hybrid Electric, and Fuel Cell Vehicles, Third Edition** CRC Press

This book presents a detailed exploration of adaption and implementation, as well as a 360-degree view spectrum of blockchain technologies in real-world business applications.

Blockchain is gaining

momentum in all sectors. This book offers a collection of protocol standards, issues, security improvements, applicability, features, and types of cryptocurrency in processing and through 5G technology. The book covers the evolution of blockchain from fundamental theories to present forms. It offers diversified business applications with usable case studies and provides successful implementations in cloud/edge computing, smart city, and IoT. The book emphasizes the advances and cutting-edge technologies along with the different tools and platforms. The primary audience for this book includes industry experts,

researchers, graduates and under graduates, practitioners, and business managers who are engaged in blockchain and IoT-related technologies.

**Brushless Permanent-magnet and Reluctance Motor Drives** Springer  
 For courses on digital design in an Electrical Engineering, Computer Engineering, or Computer Science department. Digital Design, fifth edition is a modern update of the classic authoritative text on digital design. This book teaches the basic concepts of digital design in a clear, accessible manner. The book presents the basic tools for the design of digital circuits and provides procedures suitable for a variety of digital

applications.  
Heat & Mass Transfer  
2E Tata McGraw-Hill  
Education  
Encouraged by the response to the first edition and to keep pace with recent developments, Fundamentals of Electrical Drives, Second Edition incorporates greater details on semi-conductor controlled drives, includes coverage of permanent magnet AC motor drives and switched reluctance motor drives, and highlights new trends in drive technology. Contents were chosen to satisfy the changing needs of the industry and provide the appropriate coverage of modern and conventional drives. With the large number of examples, problems,

and solutions provided, Fundamentals of Electrical Drives, Second Edition will continue to be a useful reference for practicing engineers and for those preparing for Engineering Service Examinations.

### **Computer**

**Organization** Oxford University Press, USA

This book allows students to learn fundamental concepts in linear circuit analysis using a well-developed methodology that has been carefully refined through classroom use. Applying his many years of teaching experience, the author focuses the reader's attention on basic circuit concepts and modern analysis methods. The text includes detailed coverage of basics of different terminologies

used in electric circuits, mesh and node equations, network analysis and network theorems, signals and its properties, graph theory and its application in circuit analysis, analogous systems, Fourier and Laplace transforms and their applications in circuit theory. Wide coverage of evolution integral, two-port networks, passive and active filters, state variable formulation of network problems and network synthesis have been made. Transient response and frequency domain analysis of network systems has also been discussed. The hallmark feature of this text is that it helps the reader to gain a sound understanding on the basics of circuit theory.

CONTENTS: Basic Circuit Elements and Waveforms Signals and Systems Mesh and Node Analysis Fourier Series Laplace Transform Applications of Laplace Transform Analogous Systems Graph Theory and Network Equation Network Theorems Resonance Attenuators Two-port Network Passive Filters Active Filter Fundamentals State Variable Analysis Network Functions Network Synthesis Feedback System Frequency Response Plots Discrete Systems. Switched Reluctance Motor Drives Springer Containing approximately 200 problems (100 worked), the text covers a wide range of topics concerning electrical machines, placing particular

emphasis upon electrical-machine drive applications. The theory is concisely reviewed and focuses on features common to all machine types. The problems are arranged in order of increasing levels of complexity and discussions of the solutions are included where appropriate to illustrate the engineering implications. This second edition includes an important new chapter on mathematical and computer simulation of machine systems and revised discussions of unbalanced operation, permanent-magnet machines and universal motors. New worked examples and tutorial problems have also been added.

### **The Twelve Principles of**

**Efficiency** Pearson Academic  
The why, what and how of the electric vehicle powertrain Empowers engineering professionals and students with the knowledge and skills required to engineer electric vehicle powertrain architectures, energy storage systems, power electronics converters and electric drives. The modern electric powertrain is relatively new for the automotive industry, and engineers are challenged with designing affordable, efficient and high-performance electric powertrains as the industry undergoes a technological evolution. Co-authored by two electric vehicle (EV) engineers with decades of experience

designing and putting into production all of the powertrain technologies presented, this book provides readers with the hands-on knowledge, skills and expertise they need to rise to that challenge. This four-part practical guide provides a comprehensive review of battery, hybrid and fuel cell EV systems and the associated energy sources, power electronics, machines, and drives. The first part of the book begins with a historical overview of electromobility and the related environmental impacts motivating the development of the electric powertrain. Vehicular requirements for electromechanical propulsion are then presented. Battery electric vehicles (BEV),

fuel cell electric vehicles (FCEV), and conventional and hybrid electric vehicles (HEV) are then described, contrasted and compared for vehicle propulsion. The second part of the book features in-depth analysis of the electric powertrain traction machines, with a particular focus on the induction machine and the surface- and interior-permanent magnet ac machines. The brushed dc machine is also considered due to its ease of operation and understanding, and its historical place, especially as the traction machine on NASA's Mars rovers. The third part of the book features the theory and applications for the propulsion, charging, accessory,



and auxiliary power electronics converters. Chapters are presented on isolated and non-isolated dc-dc converters, traction inverters, and battery charging. The fourth part presents the introductory and applied electromagnetism required as a foundation throughout the book. • Introduces and holistically integrates the key EV powertrain technologies. • Provides a comprehensive overview of existing and emerging automotive solutions. • Provides experience-based expertise for vehicular and powertrain system and sub-system level study, design, and optimization. • Presents many

examples of powertrain technologies from leading manufacturers. • Discusses the dc traction machines of the Mars rovers, the ultimate EVs from NASA. • Investigates the environmental motivating factors and impacts of electromobility. • Presents a structured university teaching stream from introductory undergraduate to postgraduate. • Includes real-world problems and assignments of use to design engineers, researchers, and students alike. • Features a companion website with numerous references, problems, solutions, and practical assignments. • Includes introductory material throughout the book for the

general scientific reader. • Contains essential reading for government regulators and policy makers. Electric Powertrain: Energy Systems, Power Electronics and Drives for Hybrid, Electric and Fuel Cell Vehicles is an important professional resource for practitioners and researchers in the battery, hybrid, and fuel cell EV transportation industry. The book is a structured holistic textbook for the teaching of the fundamental theories and applications of energy sources, power electronics, and electric machines and drives to engineering undergraduate and postgraduate students. Textbook Structure and Suggested Teaching Curriculum This is

primarily an engineering textbook covering the automotive powertrain, energy storage and energy conversion, power electronics, and electrical machines. A significant additional focus is placed on the engineering design, the energy for transportation, and the related environmental impacts. This textbook is an educational tool for practicing engineers and others, such as transportation policy planners and regulators. The modern automobile is used as the vehicle upon which to base the theory and applications, which makes the book a useful educational reference for our industry colleagues, from chemists to engineers. This material is also written

to be of interest to the general reader, who may have little or no interest in the power electronics and machines. Introductory science, mathematics, and an inquiring mind suffice for some chapters. The general reader can read the introduction to each of the chapters and move to the next as soon as the material gets too advanced for him or her. Part I Vehicles and Energy Sources  
Chapter 1  
Electromobility and the Environment Chapter 2  
Vehicle Dynamics  
Chapter 3 Batteries  
Chapter 4 Fuel Cells  
Chapter 5 Conventional and Hybrid Powertrains  
Part II Electrical Machines Chapter 6  
Introduction to Traction Machines Chapter 7  
The Brushed DC Machine Chapter 8

Induction Machines  
Chapter 9 Surface-permanent-magnet AC Machines Chapter 10:  
Interior-permanent-magnet AC Machines  
Part III Power Electronics Chapter 11  
DC-DC Converters  
Chapter 12 Isolated DC-DC Converters  
Chapter 13 Traction Drives and Three-phase Inverters  
Chapter 14 Battery Charging Chapter 15  
Control of the Electric Drive Part IV Basics  
Chapter 16  
Introduction to Electromagnetism, Ferromagnetism, and Electromechanical Energy Conversion The first third of the book (Chapters 1 to 6), plus parts of Chapters 14 and 16, can be taught to the general science or engineering student in the second or third year. It covers the

introductory automotive material using basic concepts from mechanical, electrical, environmental, and electrochemical engineering. Chapter 14 on electrical charging and Chapter 16 on electromagnetism can also be used as a general introduction to electrical engineering. The basics of electromagnetism, ferromagnetism and electromechanical energy conversion (Chapter 16) and dc machines (Chapter 7) can be taught to second year (sophomore) engineering students who have completed introductory electrical circuits and physics. The third year (junior) students typically have covered ac circuit

analysis, and so they can cover ac machines, such as the induction machine (Chapter 8) and the surface permanent-magnet ac machine (Chapter 9). As the students typically have studied control theory, they can investigate the control of the speed and torque loops of the motor drive (Chapter 15). Power electronics, featuring non-isolated buck and boost converters (Chapter 11), can also be introduced in the third year. The final-year (senior) students can then go on to cover the more advanced technologies of the interior-permanent-magnet ac machine (Chapter 10). Isolated power converters (Chapter 12), such as the full-bridge and resonant converters,

inverters (Chapter 13), and power-factor-corrected battery chargers (Chapter 14), are covered in the power electronics section. This material can also be covered at the introductory postgraduate level. Various homework, simulation, and research exercises are presented throughout the textbook. The reader is encouraged to attempt these exercises as part of the learning experience. Instructors are encouraged to contact the author, John Hayes, direct to discuss course content or structure.

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