

Nptel Automobile Engineering

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Electric and Hybrid Vehicles - Iqbal Husain 2021-02-22

A thoroughly revised third edition of this widely praised, bestselling textbook presents a comprehensive systems-level perspective of electric and hybrid vehicles with emphasis on technical aspects, mathematical relationships and basic design guidelines. The emerging technologies of electric vehicles require the dedication of current and

future engineers, so the target audience for the book is the young professionals and students in engineering eager to learn about the area. The book is concise and clear, its mathematics are kept to a necessary minimum and it contains a well-balanced set of contents of the complex technology. Engineers of multiple disciplines can either get a broader overview or explore in depth a particular

aspect of electric or hybrid vehicles. Additions in the third edition include simulation-based design analysis of electric and hybrid vehicles and their powertrain components, particularly that of traction inverters, electric machines and motor drives. The technology trends to incorporate wide bandgap power electronics and reduced rare-earth permanent magnet electric machines in the powertrain components have been highlighted. Charging stations are a critical component for the electric vehicle infrastructure, and hence, a chapter on vehicle interactions with the power grid has been added. Autonomous driving is another emerging technology, and a chapter is included describing the autonomous driving system architecture and the hardware and software needs for such systems. The platform has been set in this book for system-level simulations to develop models using various softwares used in academia and industry, such as MATLAB®/Simulink, PLECS,

PSIM, Motor-CAD and Altair Flux. Examples and simulation results are provided in this edition using these software tools. The third edition is a timely revision and contribution to the field of electric vehicles that has reached recently notable markets in a more and more environmentally sensitive world.

Automobile Technology - Giri N K 2004

Intelligent Mechatronic Systems - Rochdi Merzouki
2012-11-27

Acting as a support resource for practitioners and professionals looking to advance their understanding of complex mechatronic systems, *Intelligent Mechatronic Systems* explains their design and recent developments from first principles to practical applications. Detailed descriptions of the mathematical models of complex mechatronic systems, developed from fundamental physical relationships, are built on to develop innovative

solutions with particular emphasis on physical model-based control strategies. Following a concurrent engineering approach, supported by industrial case studies, and drawing on the practical experience of the authors, Intelligent Mechatronic Systems covers a range of topics and includes: An explanation of a common graphical tool for integrated design and its uses from modeling and simulation to the control synthesis Introductions to key concepts such as different means of achieving fault tolerance, robust overwhelming control and force and impedance control Dedicated chapters for advanced topics such as multibody dynamics and micro-electromechanical systems, vehicle mechatronic systems, robot kinematics and dynamics, space robotics and intelligent transportation systems Detailed discussion of cooperative environments and reconfigurable systems Intelligent Mechatronic Systems provides control,

electrical and mechanical engineers and researchers in industrial automation with a means to design practical, functional and safe intelligent systems.

Analytical Mechanics of Gears - Earle Buckingham
1988-01-01

This volume provides a solid foundation for logical gear design practices and data. Topics include an analysis of conjugate gear-tooth action, nature of the contact, and resulting gear-tooth profiles of several types of gears, plus gear teeth in action. Indispensable guide for engineers concerned with tooth geometry, manufacturing accuracies, and general design. 1949 edition.

Theory of Mechanisms and Machines - Amitabha Ghosh
1994

Brake Design and Safety - Rudolf Limpert 2011-10-04
The objectives of this third edition of an SAE classic title are to provide readers with the basic theoretical fundamentals and analytical tools necessary

to design braking systems for passenger vehicles and trucks that comply with safety standards, minimize consumer complaints, and perform safely and efficiently before and while electronic brake controls become active. This book, written for students, engineers, forensic experts, and brake technicians, provides readers with theoretical knowledge of braking physics, and offers numerous illustrations and equations that make the information easy to understand and apply. New to this edition are expanded chapters on: • Thermal analysis of automotive brakes • Analysis of hydraulic brake systems • Single vehicle braking dynamics

Materials Selection in Mechanical Design - M. F. Ashby 1992-01-01

New materials enable advances in engineering design. This book describes a procedure for material selection in mechanical design, allowing the most suitable materials for a given application to be identified from the full range of materials and section shapes

available. A novel approach is adopted not found elsewhere. Materials are introduced through their properties; materials selection charts (a new development) capture the important features of all materials, allowing rapid retrieval of information and application of selection techniques. Merit indices, combined with charts, allow optimisation of the materials selection process. Sources of material property data are reviewed and approaches to their use are given. Material processing and its influence on the design are discussed. The book closes with chapters on aesthetics and industrial design. Case studies are developed as a method of illustrating the procedure and as a way of developing the ideas further.

Vehicle Dynamics - Martin Meywerk 2015-04-17

Comprehensively covers the fundamentals of vehicle dynamics with application to automotive mechatronics. Presents a number of different design, analysis

and implementation considerations related to automobiles, including power requirements, converters, performance, fuel consumption and vehicle dynamic models. Covers the dynamics, modeling and control of not only the entire vehicle system, but also of key elements of the vehicle such as transmissions, and hybrid systems integration. Includes exercise problems and MATLAB® codes. Accompanied by a website hosting animations.

Automotive Engineering Fundamentals - Richard Stone 2004-04-30

In the introduction of *Automotive Engineering Fundamentals*, Richard Stone and Jeffrey K. Ball provide a fascinating and often amusing history of the passenger vehicle, showcasing the various highs and lows of this now-indispensable component of civilized societies. The authors then provide an overview of the publication, which is designed to give the student of automotive engineering a basic understanding of the principles

involved with designing a vehicle. From engines and transmissions to vehicle aerodynamics and computer modeling, the intelligent, interesting presentation of core concepts in *Automotive Engineering Fundamentals* is sure to make this an indispensable resource for engineering students and professionals alike.

System Dynamics and Control - Eronini Umez-Eronini 1999

This applied and comprehensive book combines topical coverage of both *System Dynamics* and *Automatic Controls* in one text, resulting in a pedagogically sound presentation of both subjects that can be used in this standard two-course sequence. It is thorough and complete, with, according to one reviewer, a "tremendous number of interesting practice problems covering a broad range of areas, giving the instructor significant choice and flexibility" in teaching the material. The book also has a wealth of worked-out, real-

world examples, with every step clearly shown and explained. Cumulative examples that build through succeeding chapters demonstrate the stages of system modeling, from initial steps - which include the important but often omitted physical modeling process - through mathematical analysis to design realization. The result is a new and unified presentation of system dynamics and control, founded on a wide range of systems (mechanical, electrical, electromechanical - including MEMS, fluid, thermal, and chemical), with a common state-space approach.

A Physical Introduction to Fluid Mechanics - Alexander J. Smits 2000

Uncover Effective Engineering Solutions to Practical Problems With its clear explanation of fundamental principles and emphasis on real world applications, this practical text will motivate readers to learn. The author connects theory and analysis to practical examples drawn from

engineering practice. Readers get a better understanding of how they can apply these concepts to develop engineering answers to various problems. By using simple examples that illustrate basic principles and more complex examples representative of engineering applications throughout the text, the author also shows readers how fluid mechanics is relevant to the engineering field. These examples will help them develop problem-solving skills, gain physical insight into the material, learn how and when to use approximations and make assumptions, and understand when these approximations might break down. Key Features of the Text

- * The underlying physical concepts are highlighted rather than focusing on the mathematical equations. *
- Dimensional reasoning is emphasized as well as the interpretation of the results. *
- An introduction to engineering in the environment is included to spark reader interest. *
- Historical references

throughout the chapters provide readers with the rich history of fluid mechanics.

Fundamentals of Electrical

Drives - G. K. Dubey 2002-05

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.

Introduction to IoT - Sudip Misra 2021-06-10

A valuable guide for new and experienced readers, featuring the complex and massive world of IoT and IoT-based solutions.

Motor Vehicle - T. K. Garrett

2000-12-18

"As a reference book it has to be classed as one of the best!

There should be a copy of it in every college library."

Association of Motor Vehicle

Teachers' Newsletter The Motor Vehicle has been an

essential reference work for both the student and practising

engineer ever since the first edition appeared in 1929.

Today it is as indispensable to anyone with a serious interest

in vehicle design techniques, systems and construction as it was then. The current edition

has undergone a major revision to include seven new chapters.

These include Electric Propulsion; covering all aspects

from lead acid and alternative batteries to fuel cells and

hybrid vehicles, Static and Dynamic Safety, and Wheels

and Tyres. The chapter on the compression ignition engine

has been expanded to form three chapters, concentrating

on aspects such as common rail injection, recently developed distributor type pumps and electronic control of injection. Automatic, semi-automatic and continuously variable ratio transmissions are covered in two new chapters. A third contains information on the latest developments in computer-aided control over both braking and traction, for improving vehicle stability, while another contains entirely new information on the practice and principles of electrically-actuated power-assisted steering. Also included is coverage of material detailing the latest knowledge and practice relating to safety systems, vehicle integrity, braking systems and much more. The established layout of the book is retained, with topics relating to the Engine, Transmission and Carriage Unit dealt with in turn. Each chapter is well-provided with diagrams, sections, schematics and photographs, all of which contribute to a clear and concise exposition of the material under discussion.

Latest extensive revisions to a well-established title New chapters on electric propulsion and vehicle safety.

A Text Book of Automobile Engineering - R. K. Rajput
2008

Automotive Transmissions -
Harald Naunheimer
2010-11-09

This book gives a full account of the development process for automotive transmissions.

Main topics: - Overview of the traffic - vehicle - transmission system - Mediating the power flow in vehicles - Selecting the ratios - Vehicle transmission systems - basic design principles - Typical designs of vehicle transmissions - Layout and design of important components, e.g. gearshifting mechanisms, moving-off elements, pumps, retarders - Transmission control units - Product development process, Manufacturing technology of vehicle transmissions, Reliability and testing The book covers manual, automated manual and automatic transmissions as well as

continuously variable transmissions and hybrid drives for passenger cars and commercial vehicles. Furthermore, final drives, power take-offs and transfer gearboxes for 4-WD-vehicles are considered. Since the release of the first edition in 1999 there have been a lot of changes in the field of vehicles and transmissions. About 40% of the second edition's content is new or revised with new data.

Automotive Ergonomics - Nikolaos Gkikas 2016-04-19

In the last 20 years, technological developments have set new standards in driver-vehicle interaction. These developments effect the entire lifecycle, from the moment a customer enters a dealership to examine a prospective vehicle, to the driving experience during the vehicle lifecycle, and the interaction with other road users and facilities in pl

Handbook on Battery Energy Storage System - Asian Development Bank 2018-12-01

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.

Inspection and Measurement in Manufacturing - William Winchell 1996

For the experienced manufacturing professional, the book offers a review of inspection and measurement concepts, and some new insights into the subject. For those new to inspection and measurement, the text will help them grasp the technology

involved and the methods for effectively planning applications.

Smart Material Systems and MEMS - Vijay K. Varadan
2006-11-02

Presenting unified coverage of the design and modeling of smart micro- and macrosystems, this book addresses fabrication issues and outlines the challenges faced by engineers working with smart sensors in a variety of applications. Part I deals with the fundamental concepts of a typical smart system and its constituent components. Preliminary fabrication and characterization concepts are introduced before design principles are discussed in detail. Part III presents a comprehensive account of the modeling of smart systems, smart sensors and actuators. Part IV builds upon the fundamental concepts to analyze fabrication techniques for silicon-based MEMS in more detail. Practicing engineers will benefit from the detailed assessment of applications in communications

technology, aerospace, biomedical and mechanical engineering. The book provides an essential reference or textbook for graduates following a course in smart sensors, actuators and systems. **Engineers Black Book** - 2018 "This easy-to-use pocket book contains a wealth of up-to-date, useful, practical and hard-to-find information. With 160 matt laminated, greaseproof pages you'll enjoy glare-free reading and durability. Includes: data sheets, formulae, reference tables and equivalent charts. New content in the 3rd edition includes; Reamer and Drill Bit Types, Taper Pins, T-slot sizing, Counterboring/Sinking, Extended Angles Conversions for Cutting Tapers, Keyways and Keyseats, Woodruff Keys, Retaining Rings, O-Rings, Flange Sizing, Common Workshop Metals, Adhesives, GD&T, Graph and Design Paper included at the back of the book. Engineers Black Book contains a wealth of up-to-date, useful, information within over 160 matt laminated grease proof pages. It is ideal

for engineers, trades people, apprentices, machine shops, tool rooms and technical colleges." -- publisher website.

MACHINING AND MACHINE TOOLS (With CD)

) - A.B.Chattopadhyay 2011-08

Market_Desc: Primary
Market_Mechanical Engineering students. UG students of the allied disciplines like Manufacturing Engineering, Production Engineering, Industrial Engineering, Aero. Engg, Automobile Engg, Manuf. Sc. & Engg. Students in PG and Dual Degree. Secondary Market_Students and young professionals trying for AMIE certificate from the Institution of Engineers where also machining and machine tools is a compulsory subject for the Mechanical Engineering stream. The candidates preparing for the competitive examinations like IES, IRSE, IFS, etc. will also be benefited by this book. Special Features:
· Comprehensive coverage from basic to advanced topics.
· Lucid and simple-to-understand style of explanation.
· Key concepts are driven home with

apt examples and solved problems.
· Visual recall is enhanced by the clear artwork accompanying all the concepts.
· Solved and unsolved problems are included to inculcate problem-solving abilities in the reader.
· This book has been pedagogically enriched with:
ü 600 line diagrams and photographs of all types of machine tools and instruments used in manufacturing processes
ü 100+ solved problems and examples
ü 120+ unsolved problems
ü 430+ objective type questions, with special focus on competitive exams
ü Nearly 600 review questions (long and short answer) covering all topics for university exams
CD Companion:
· Answers to multiple-choice questions.
· Chapters wise References.
· Bibliography
· Two Model Question Papers
About The Book: Machining and machine tools is a text targeted towards the students and teachers for the undergraduate Manufacturing Processes course in the Mechanical Engineering discipline. Post

graduate students in the production and manufacturing streams will also find this book a good reference. This book brings a holistic approach to the understanding of machine tools and manufacturing processes, giving equal emphasis to historical background and chronological development, and to modern developments in manufacturing and contemporary machining processes. With the help of lucid explanations coupled with striking examples and accompanying visual aids, the book begins from the very basics and gradually builds reader understanding up to the advanced topics in this field. This is also a handy text for practising professionals as it contains all the relevant tables, data and figures, and can act as a quick reference.

Machine Drawing - K. L.

Narayana 2009-06-30

About the Book: Written by three distinguished authors with ample academic and teaching experience, this textbook, meant for diploma and degree students of

Mechanical Engineering as well as those preparing for AMIE examination, incorporates the latest st **Handbook of Research on Emerging Trends and Technologies in Library and Information Science** -

Kaushik, Anna 2019-11-22

With the perpetual advancements of technology, library and information science professionals are tasked with understanding these technologies and providing accurate and comprehensive information to other potential users. These professionals must develop best practices for understanding these technologies in order to best serve other users. The Handbook of Research on Emerging Trends and Technologies in Library and Information Science is a critical research book that examines advancing technologies and new innovations and their influences on library and information sciences for improved best practices. Featuring an array of topics

such as digital libraries, distance education, and information literacy, this publication is essential for librarians, knowledge managers, information retrieval specialists, library and information science professionals, information scientists, researchers, web librarians, academicians, educators, IT specialists, and managers.

Semi-active Suspension

Control - Emanuele

Guglielmino 2008-05-27

Semi-active Suspension Control provides an overview of vehicle ride control employing smart semi-active damping systems.

These systems are able to tune the amount of damping in response to measured vehicle-ride and handling indicators.

Two physically different dampers (magnetorheological and controlled-friction) are analysed from the perspectives of mechatronics and control.

Ride comfort, road holding, road damage and human-body modelling are studied.

Mathematical modelling is balanced by a large and

detailed section on experimental implementation, where a variety of automotive applications are described offering a well-rounded view. The implementation of control algorithms with regard to real-life engineering constraints is emphasised. The applications described include semi-active suspensions for a saloon car, seat suspensions for vehicles not equipped with a primary suspension, and control of heavy-vehicle dynamic-tyre loads to reduce road damage and improve handling.

Engine Emissions - B. P.

Pundir 2007

"Engine Emissions: Pollutant Formation and Advances in Control Technology provides an up to date reference to academics and professionals on emissions from SI and CI engine powered vehicles. - In this text, mechanism of formation of engine emissions, effect of engine design and operation variables, world wide vehicle emission standards and emission measurement and test procedures are presented.

Advances in emission control

technology that have taken place from those used initially and up to the ones employed on the present day vehicles meeting the stringent emission regulations e.g., Euro 4, ULEV, SULEV standards are discussed. - Newer developments on exhaust aftertreatment such as HC adsorber systems, NO_x traps and other de-NO_x catalysts, and advanced engines like GDI and HCCI engines are covered in the book."--Jacket.

Smart Structures Theory -

Inderjit Chopra 2014

This book focuses on smart materials and structures, which are also referred to as intelligent, adaptive, active, sensory, and metamorphic. The ultimate goal is to develop biologically inspired multifunctional materials with the capability to adapt their structural characteristics, monitor their health condition, perform self-diagnosis and self-repair, morph their shape, and undergo significant controlled motion.

Modern Electric, Hybrid Electric, and Fuel Cell Vehicles

- Mehrdad Ehsani 2018-02-02

"This book is an introduction to automotive technology, with specific reference to battery electric, hybrid electric, and fuel cell electric vehicles. It could serve electrical engineers who need to know more about automobiles or automotive engineers who need to know about electrical propulsion systems. For example, this reviewer, who is a specialist in electric machinery, could use this book to better understand the automobiles for which the reviewer is designing electric drive motors. An automotive engineer, on the other hand, might use it to better understand the nature of motors and electric storage systems for application in automobiles, trucks or motorcycles. The early chapters of the book are accessible to technically literate people who need to know something about cars. While the first chapter is historical in nature, the second chapter is a good introduction to automobiles, including

dynamics of propulsion and braking. The third chapter discusses, in some detail, spark ignition and compression ignition (Diesel) engines. The fourth chapter discusses the nature of transmission systems.” —James Kirtley, Massachusetts Institute of Technology, USA “The third edition covers extensive topics in modern electric, hybrid electric, and fuel cell vehicles, in which the profound knowledge, mathematical modeling, simulations, and control are clearly presented. Featured with design of various vehicle drivetrains, as well as a multi-objective optimization software, it is an estimable work to meet the needs of automotive industry.” —Haiyan Henry Zhang, Purdue University, USA “The extensive combined experience of the authors have produced an extensive volume covering a broad range but detailed topics on the principles, design and architectures of Modern Electric, Hybrid Electric, and Fuel Cell Vehicles in a well-structured, clear and concise

manner. The volume offers a complete overview of technologies, their selection, integration & control, as well as an interesting Technical Overview of the Toyota Prius. The technical chapters are complemented with example problems and user guides to assist the reader in practical calculations through the use of common scientific computing packages. It will be of interest mainly to research postgraduates working in this eld as well as established academic researchers, industrial R&D engineers and allied professionals.”

—Christopher Donaghy-Sparg, Durham University, United Kingdom 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. All the chapters have been updated, and two new chapters on Mild Hybrids and Optimal Sizing and Dimensioning and Control are also included • Chapters updated throughout the text. • New homework problems, solutions, and examples. • Includes two new chapters. • Features accompanying MATLAB™ software.

Handbook of Biomass Downdraft Gasifier Engine Systems - Thomas B. Reed 1988

Electric Powertrain - John G. Hayes 2018-02-05

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 subsystem 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.

High-Performance and Specialty Fibers - Japan The Society of Fiber Science and Techno 2016-08-16

This book reviews the key technologies and characteristics of the modern man-made specialty fibers mainly developed in Japan. Since the production of many low-cost man-made fibers

shifted to China and other Asian countries, Japanese companies have focused on production of high-quality, high-performance super fibers as well as highly functionalized fibers so-called 'Shin-gosen'. Zylon™ and Dyneema™ manufactured by Toyobo, Technora™ produced by Teijin, and Vectran™ developed by Kuraray are those examples of super fibers. Carbon fibers Torayca™ from Toray have occupied the most advanced high-performance application area. Various types of polyester fibers having design-shaped cross-sections and special fiber morphologies and those showing specific physico-chemical properties have also been developed to acquire a high-value textile market of the world. This book describes how these high-tech fibers have been developed and what aspects are the most important in each fiber based on its structure-property relationship. Famous specialists both in industry and academia are responsible for the contents, explaining the

design concepts and the special technologies for the production of these special fibers. For university teachers and students, this volume is an excellent textbook that elucidates the basic concepts of modern fibers. At the same time, researchers, both in academia and industry, will find a comprehensive overview of recent man-made fibers. This publication, presenting the most easily understandable general survey of specialty man-made fibers to date, is dedicated to the 70th-anniversary of the Society of Fiber Science and Technology, Japan.

Applied Thermodynamics for Engineering Technologists - Eastop 1993

Engineering Metrology and Measurements -

Raghavendra, 2013-05
Engineering Metrology and Measurements is a textbook designed for students of mechanical, production and allied disciplines to facilitate learning of various shop-floor measurement techniques and

also understand the basics of mechanical measurements.

Steam Power Engineering - Vinayak N. Kulkarni

A steam/thermal power station uses heat energy generated from burning coal to produce electrical energy. ... From the turbine the steam is cooled back to water in the Condenser, the resulting water is fed back into the boiler to repeat the cycle.

Encyclopedia of Automotive Engineering - David Crolla
2015-03-23

A Choice Outstanding Academic Title The Encyclopedia of Automotive Engineering provides for the first time a large, unified knowledge base laying the foundation for advanced study and in-depth research. Through extensive cross-referencing and search functionality it provides a gateway to detailed but scattered information on best industry practice, engendering a better understanding of interrelated concepts and techniques that cut across specialized areas of engineering. Beyond traditional

automotive subjects the Encyclopedia addresses green technologies, the shift from mechanics to electronics, and the means to produce safer, more efficient vehicles within varying economic restraints worldwide. The work comprises nine main parts: (1) Engines: Fundamentals (2) Engines: Design (3) Hybrid and Electric Powertrains (4) Transmission and Driveline (5) Chassis Systems (6) Electrical and Electronic Systems (7) Body Design (8) Materials and Manufacturing (9) Telematics. Offers authoritative coverage of the wide-ranging specialist topics encompassed by automotive engineering An accessible point of reference for entry level engineers and students who require an understanding of the fundamentals of technologies outside of their own expertise or training Provides invaluable guidance to more detailed texts and research findings in the technical literature Developed in conjunction with FISITA, the umbrella organisation for the national automotive societies in

37 countries around the world and representing more than 185,000 automotive engineers
6 Volumes

www.automotive-reference.com An essential resource for libraries and information centres in industry, research and training organizations, professional societies, government departments, and all relevant engineering departments in the academic sector.

Automotive Mechatronics - Konrad Reif 2014-08-25

As the complexity of automotive vehicles increases this book presents operational and practical issues of automotive mechatronics. It is a comprehensive introduction to controlled automotive systems and provides detailed information of sensors for travel, angle, engine speed, vehicle speed, acceleration, pressure, temperature, flow, gas concentration etc. The measurement principles of the different sensor groups are explained and examples to show the measurement principles applied in different

types.

Ergonomics in the Automotive Design Process - Vivek D. Bhise
2016-04-19

The auto industry is facing tough competition and severe economic constraints. Their products need to be designed "right the first time" with the right combinations of features that not only satisfy the customers but continually please and delight them by providing increased functionality, comfort, convenience, safety, and craftsmanship. Based on t

TEXTBOOK OF FINITE ELEMENT ANALYSIS - P. SESHU
2003-01-01

Designed for a one-semester course in Finite Element Method, this compact and well-organized text presents FEM as a tool to find approximate solutions to differential equations. This provides the student a better perspective on the technique and its wide range of applications. This approach reflects the current trend as the present-day applications range from structures to biomechanics to

electromagnetics, unlike in conventional texts that view FEM primarily as an extension of matrix methods of structural analysis. After an introduction and a review of mathematical preliminaries, the book gives a detailed discussion on FEM as a technique for solving differential equations and variational formulation of FEM. This is followed by a lucid presentation of one-dimensional and two-dimensional finite elements and finite element formulation for dynamics. The book concludes with some case studies that focus on industrial problems and Appendices that include mini-project topics based on near-real-life problems. Postgraduate/Senior undergraduate students of civil, mechanical and aeronautical engineering will find this text extremely useful; it will also appeal to the practising engineers and the teaching community.

Transportation Decision Making - Kumares C. Sinha
2011-09-09

This pioneering text provides a

holistic approach to decisionmaking in transportation project development and programming, which can help transportation professionals to optimize their investment choices. The authors present a proven set of methodologies for evaluating transportation projects that ensures that all costs and impacts are taken into consideration. The text's logical organization gets readers started with a solid foundation in basic principles and then progressively builds on that foundation. Topics covered include: Developing performance measures for evaluation, estimating travel demand, and costing transportation projects Performing an economic efficiency evaluation that accounts for such factors as travel time, safety, and vehicle operating costs Evaluating a project's impact on economic development and land use as well as its impact on society and culture Assessing a project's environmental impact,

including air quality, noise, ecology, water resources, and aesthetics Evaluating alternative projects on the basis of multiple performance criteria Programming transportation investments so that resources can be optimally allocated to meet facility-specific and system-wide goals Each chapter begins with basic definitions and concepts followed by a methodology for impact assessment. Relevant legislation is discussed and available software for performing evaluations is presented. At the end of each chapter, readers are provided resources for detailed investigation of particular topics. These include Internet sites and publications of international and domestic agencies and research institutions. The authors also provide a companion Web site that offers updates, data for analysis, and case histories of project evaluation and decisionmaking. Given that billions of dollars are spent each year on transportation systems in the United States

alone, and that there is a need for thorough and rational evaluation and decision making for cost-effective system preservation and improvement, this text should be on the desks of all transportation planners, engineers, and educators. With exercises in every chapter, this text is an ideal coursebook for the subject of transportation systems analysis and evaluation.

Gear Geometry and Applied Theory - Faydor L. Litvin
2004-09-06

This revised, expanded, edition covers the theory, design, geometry and manufacture of all types of gears and gear drives. This is an invaluable reference for designers, theoreticians, students, and manufacturers. This edition includes advances in gear theory, gear manufacturing,

and computer simulation.

Among the new topics are: 1. New geometry for modified spur and helical gears, face-gear drives, and cycloidal pumps. 2. New design approaches for one stage planetary gear trains and spiral bevel gear drives. 3. An enhanced approach for stress analysis of gear drives with FEM. 4. New methods of grinding face gear drives, generating double crowned pinions, and improved helical gear shaving. 5. Broad application of simulation of meshing and TCA. 6. New theories on the simulation of meshing for multi-body systems, detection of cases wherein the contact line on generating surfaces may have its own envelope, and detection and avoidance of singularities of generated surfaces.