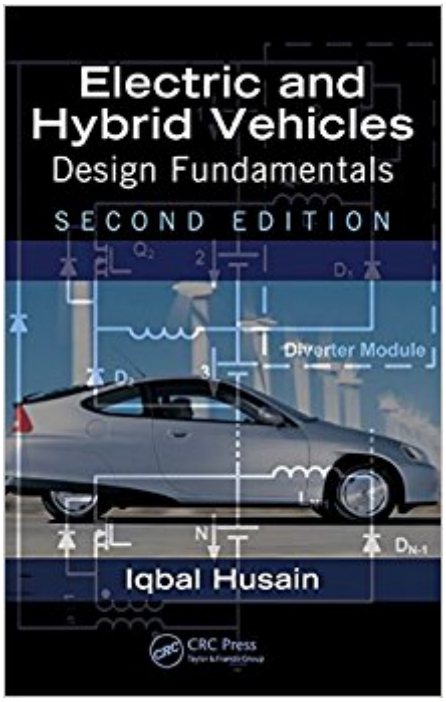
Electric And Hybrid Vehicles: Design Fundamentals, Second Edition



Synopsis

Thoroughly updated to encompass the significant technological advances since the publication of the first edition, Electric and Hybrid Vehicles: Design Fundamentals, Second Edition presents the design fundamentals, component sizing, and systems interactions of alternative vehicles. This new edition of a widely praised, bestselling textbook maintains the comprehensive, systems-level perspective of electric and hybrid vehicles while covering the hybrid architectures and components of the vehicle in much greater detail. The author emphasizes technical details, mathematical relationships, and design guidelines throughout the text. New to the Second Edition New chapters on sizing and design guidelines for various hybrid architectures, control strategies for hybrid vehicles, powertrain component cooling systems, and in-vehicle communication methods New sections on modeling of energy storage components, tire-road force mechanics, compressed air-storage, DC/DC converters, emission control systems, electromechanical brakes, and vehicle fuel economy Reorganization of power electronics, electric machines, and motor drives sections Enhanced sections on mechanical components that now include more technical descriptions and example problems An emphasis on the integration of mechanical and electrical components, taking into account the interdisciplinary nature of automotive engineering As an advisor to the University of AkronÃ¢â ¬â„¢s team in the Challenge X: Crossover to Sustainable Mobility, Dr. Husain knows first-hand how to teach students both the fundamentals and cutting-edge technologies of the next generation of automotives. This text shows students how electrical and mechanical engineers must work together to complete an alternative vehicle system. It empowers them to carry on state-of-the-art research and development in automotive engineering in order to meet todayÃ¢â ¬â„¢s needs of clean, efficient, and sustainable vehicles.

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Customer Reviews

Dr. Iqbal Husain takes his new edition of Electric and Hybrid Vehicles: Design Fundamentals to the next level, adding substantial depth to the coverage of vehicle architectures and components while maintaining a comprehensive systems-level approach. The book presents a thorough and well-organized multidisciplinary perspective, excellent for undergraduate and beginning graduate-level courses, and as a resource for practicing engineers interested in the latest developments in electric and hybrid vehicles. The technical content, examples, and case studies are laced with the authorÃ¢â ¬â„¢s significant hands-on design experience.Ã¢â ¬â ¢Annette von Jouanne, Professor in the School of Electrical Engineering and Computer Science, Oregon State University, Corvallis, USA Ã¢â ¬Â¦it seems that the author has covered all materials related to hybrid vehicles. More specifically, various components used in an HEV are described. Ã¢â ¬Â¦ This book is well written and is appropriate for adoption as a textbook for a senior undergraduate/graduate course. In fact, the solved problems and end-of-chapter problems make it a very good textbook. Ã¢â ¬Â¦ it can also be used a reference book. Ã¢â ¬Â¦ There are a few books on the subject of hybrid vehicles in the market today. However, I rank this book among the best on the subject matter. Based on the table of contents and the two chapters that I have reviewed, the book does an excellent job in defining the problem and analyzing all its components.Ã¢â ¬â ¢Hamid A. Toliyat, Raytheon Endowed Professor in the Department of Electrical & Computer Engineering, Texas A&M University, College Station, USA Praise for the First Edition: Ã¢â ¬Â¦represents a systems-level perspective on electric and hybrid vehicles technical aspects, basic mathematical relationships and fundamental design guidelines. Ã¢â ¬Â¦ The author has chosen to write a book on the basics of EHV, directed mainly to engineering students. Ã¢â ¬Â¦proceeds with remarkable consistence to detail this goal over the 10 chapters if the book Ã¢â ¬Â¦ The book is concise and clear, its mathematics are kept to a necessary minimum, but fully representative of the scope and the content is well balanced in general. Ã¢â ¬Â¦ a new and timely contribution to the field Ã¢â ¬Â¦ warmly recommend it to academiaÃ¢â ¬Â¦Ã¢â ¬â ¢Ion Boldea, Journal of Electrical Engineering Through a balanced blend of traditional and relatively new topics, Iqbal HusainÃ¢â ¬â„¢s Electric and Hybrid Vehicles: Design Fundamentals introduces

students to the Ã¢â ¬Ëœbig pictureÃ¢â ¬â„¢ of EVs and HEVs. This book significantly exposes students to nearly every aspect of electric and hybrid vehicles without overemphasizing only one topic. The basic aspects of electric and hybrid vehicles are discussed well Ã¢â ¬â ¢ from overall concepts to more detailed design Ã¢â ¬â ¢ and reinforced through good examples, illustrations, and exercise problems. Dr. HusainÃ¢â ¬â„¢s well-paced coverage and an easy-to-follow writing style are key to studentsÃ¢â ¬â„¢ understanding and success. My students will have no problem reading this material regardless of his/her electrical or mechanical engineering background. Being a faculty member in a major university with a strong research EV and HEV program, I feel this book truly provides quite enough materials for my needs and will be a big hit with college students and faculty.Ã¢â ¬â ¢Longya Xu, Department of Electrical Engineering, Ohio State University Ã¢â ¬Â¦ a thorough and insightful introduction to the interdisciplinary topic of traction design for road vehicles. The necessary requirements of energy storage, conversion and processing are presented as the means to providing vehicular performance in a logical progression that students will find readily understandable and practicing engineers will appreciate as a useful reference source. Overall the practical importance of systems engineering and its control are made evident. Salient features are emphasized by worked examples with realistic parameters.Ã¢â ¬â ¢late Alan K. Wallace, Professor of Electrical Engineering, Oregon State University, Corvallis, USA

Iqbal Husain is a professor in the Department of Electrical and Computer Engineering at the University of Akron in Ohio. He received his Ph.D. in electrical engineering from Texas A&M University. Dr. Husain is the founder of the Electric and Hybrid Vehicle Program at the University of Akron, which encompasses graduate and undergraduate courses, research on electric drives for electric and hybrid vehicles, and collegiate-level competitions on alternative vehicles. An IEEE Fellow, he is the recipient of the National Science Foundation CAREER award, the IEEE-IAS Outstanding Young Member award, the IEEE Third Millennium Medal, the College of Engineering Outstanding Researcher Award, and the Society of Automotive Engineers Vincent Bendix Automotive Electronics Engineering Award.

Excellent reference material. Good treatment of both theory and practice. As a former airplane maintenance professional, I hope to apply some of it soon.

Horrible book, not enough examples, problems require knowledge beyond what is in the book

If you are a student, buy regular book since you won't be able to print anything...not even one page. I was hoping to print out pages with formulas, graphs, etc.

I bought this before it was sold out. Ended up sharing it with my classmates. Great book for the subject.

It 's very good. I like it

This book is very hard to follow. The author presents examples (and sometimes answers) without outlining how to solve the problems. This is very frustrating! Most of the work in the book is calculus-based which would not be a problem if the steps for deriving the equations were more explicit. The information is very theoretical with little practical relevance to electric car design. The author starts out by explaining generic vehicle mechanics and then jumps right into battery chemistry and motors. Very little effort is spent on the interrelationships between these elements. The author does a decent job describing motor fundamentals, but he does not spend much time discussing the practical limitations of the technology. The hybrid discussion is relegated to the last chapter of the book, and then only a few pages are devoted to explaining this technology. Most of the chapter is spent describing various thermodynamic cycles such as the Otto cycle and Rankine cycle. Curiously,at this point the author resorts to a very high level discussion of these cycles, using very little math to show the effects of the electric motor on the function and efficiency of the traditional ICE vehicle.

Dr. Husain is an Electrical Engineer, therefore his book focuses primarily on the electrical, magnetic, electromagnetic & electromechanical aspects of EV & HEV vehicle design. From this perspective, his book is very solid on fundamental EV & HEV design considerations and component analyses. However, the continuously variable transmission (CVT)... including planetary gearsets (used in CVTs to combine/split torque) is a key HEV component. Consequently, I view omitting their discussion as dissapointing. On the other hand, Dr. Husain's text is very well written/edited and his style of explaining technical details is conversational, yet professional. I recommend this book without hessitation.

Very academic. A lot of electrical theory not much practical advice for building an EV. The book is designed for university students I think.

Electric and Hybrid Vehicles: Design Fundamentals, Second Edition Hybrid and Electric Vehicles (Innovative Technologies) Standard Catalog Of Die-Cast Vehicles: Identification And Values, Revised Edition (Standard Catalog of Die-Cast Vehicles) The World Encyclopedia of Tanks & Armoured Fighting Vehicles: Over 400 Vehicles And 1200 Wartime And Modern Photographs Electric Smoker Cookbook Smoke Meat Like a PRO: TOP Electric Smoker Recipes and Techniques for Easy and Delicious BBQ (Electric Smoker Cookbook, ... Smoker Recipes, Masterbuilt Smoker Cookbook) Hybrid and Electric Cars (Pogo: Green Planet) Hybrid and Electric Cars (At Issue) Solar Powered Charging Infrastructure for Electric Vehicles: A Sustainable Development Plastic Injection Molding: Mold Design and Construction Fundamentals (Fundamentals of Injection Molding) (2673) (Fundamentals of injection molding series) Plastic Injection Molding: Product Design & Material Selection Fundamentals (Vol II: Fundamentals of Injection Molding) (Fundamentals of injection molding series) Electric Circuit Fundamentals (7th Edition) (Floyd Electronics Fundamentals Series) Graphic Design Success: Over 100 Tips for Beginners in Graphic Design: Graphic Design Basics for Beginners, Save Time and Jump Start Your Success (graphic ... graphic design beginner, design skills) Experiments in Electronics Fundamentals and Electric Circuits Fundamentals Hydrostatic, Aerostatic and Hybrid Bearing Design Type Hybrid: Typography in Multilingual Design Electric Power Generation, Transmission, and Distribution, Third Edition (Electric Power Engineering Series) Computational Methods for Electric Power Systems, Third Edition (Electric Power Engineering Series) Power Pressure Cooker XL Cookbook: The Quick And Easy Pressure Cooker Cookbook Ã¢â ¬â œ Simple, Quick And Healthy Electric Pressure Cooker Recipes (Electric Pressure Cooker Cookbook) Power Pressure Cooker XL Cookbook: The Quick And Easy Pressure Cooker Cookbook Ã¢â ¬â œ Simple, Quick And Healthy Electric Pressure Cooker Recipes (Electric Pressure Cooker Cookbook) (Volume 1) Instant Pot Cookbook: Healthy and Tasty Vegan Instant Pot Recipes for Electric Pressure Cooker! (Instant Pot Recipes - Instant PotÃ Â® Electric Pressure Cooker)