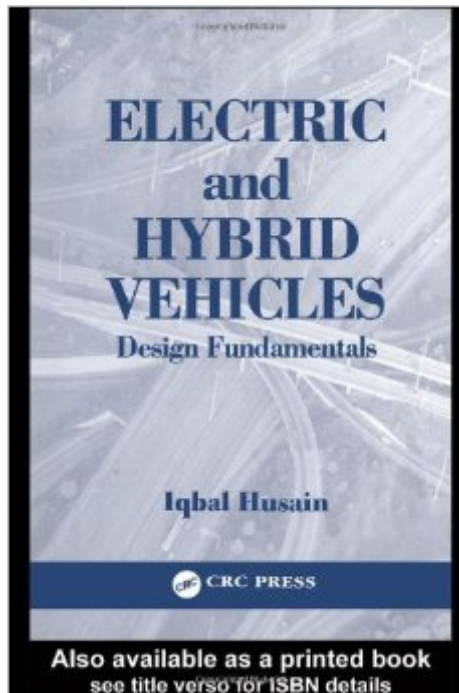


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# Electric And Hybrid Vehicles: Design Fundamentals



## Synopsis

With advances driven by pressure from governments, environmental activists, and its associated industries, the subject of electric and hybrid vehicles is becoming increasingly important. Trends clearly suggest that we must educate the engineers of today and tomorrow in the technical details of these vehicles. While there are many books that provide narrative descriptions of electric and hybrid vehicle components, none cover the technical aspects from a mathematically derived, design point of view, and none serve well as a textbook. *Electric and Hybrid Vehicles: Design Fundamentals* presents a comprehensive, systems-level perspective of these vehicles that strikes an outstanding balance between technical details, design equations, numerical examples, and case studies. Starting with some historic background, the author describes the system components, the laws of physics governing vehicle motion, the mathematical relationships within and between the components, energy sources, and designing components to meet the complete vehicle specifications. As this text illustrates, the electric vehicle is an excellent example of electro-mechanical and electro-chemical systems, one that is technically challenging as well as highly motivating to engineering students. The material presented is designed to be covered comfortably in a one-semester course. Its multidisciplinary nature and systems approach makes *Electric and Hybrid Vehicles* ideal for teaching electrical, mechanical, and chemical engineers all in one course.

## Book Information

Hardcover: 288 pages

Publisher: CRC Press; 1 edition (March 12, 2003)

Language: English

ISBN-10: 0849314666

ISBN-13: 978-0849314667

Product Dimensions: 9.7 x 6.2 x 0.8 inches

Shipping Weight: 1.2 pounds

Average Customer Review: 3.4 out of 5 stars [See all reviews](#) (9 customer reviews)

Best Sellers Rank: #3,003,238 in Books (See Top 100 in Books) #31 in [Books > Engineering & Transportation > Automotive > Electric & Hybrid](#) #214 in [Books > Engineering & Transportation > Automotive > Repair & Maintenance > Electrical Systems](#) #317 in [Books > Engineering & Transportation > Automotive > Repair & Maintenance > Vehicle Design & Construction](#)

## Customer Reviews

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 disappointing. 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 hesitation.

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.

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.

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

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

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