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Descrizione fisica	1 online resource (665 p.)
Collana	Power Electronics and Power Systems, , 2196-3185
Disciplina	621.31042
Soggetti	Energy systems Power electronics Machinery Mechatronics Industrial engineering Production engineering Energy Systems Power Electronics, Electrical Machines and Networks Machinery and Machine Elements Industrial and Production Engineering
Lingua di pubblicazione	Inglese
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Note generali	Description based upon print version of record.
Nota di bibliografia	Includes bibliographical references and index.
Nota di contenuto	Introduction -- Electromechanical Energy Conversion -- Magnetic and Electrical Coupling Field -- Magentic Circuit -- Routing Electrical Machines -- Modeling Electrical Machines -- Single Fed and Double Fed Converters -- Magnetic Field in the Air Gap -- Energy, Flux and Torque -- Electromotive Forces -- Introduction to DC Machines -- Modeling and Supplying DC Machines -- Characteristics of DC Machines -- Induction Machines -- Induction Machines at Steady State -- Variable Speed Induction Machines -- Synchronous Machines -- Mathematical Model of Synchronous Machine -- Steady State Operation -- Transients in Synchronous Machines -- Variable Frequency Synchronous Machines.
Sommario/riassunto	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 related 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. This textbook is intended for undergraduate students of electrical engineering as their first course in electrical machines. It is also recommended for students preparing capstone projects in which they need to understand, model, supply, control and specify electric machines. Additionally, it can be used as a valuable reference for other engineering disciplines involved with electrical motors and generators.