

# PREFACE

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This book offers an introduction to principles of electric machines and the closely related area of power electronics and adjustable speed drives. It is designed for students in electrical and other engineering disciplines, as well as being a useful reference and self-study guide for the professional dealing with this important area. The coverage of the book is intended to enable its use in a number of ways including service courses taught to nonelectrical majors. The organization and details of the material allow a maximum flexibility for the instructor to select topics for inclusion in courses in the modern engineering curriculum.

This book does not require a level of mathematical sophistication beyond that given in undergraduate courses in basic physics and introductory electric circuits. The emphasis in coverage is given to an improved understanding of the operational characteristics of the electric apparatus discussed, on the basis of linear mathematical models. Almost every key concept is illustrated through the use of in-text examples that are worked out in detail to enforce the reader's understanding. Many practical problems in electric machines operation involve the use of known performance variables under a given operational condition to predict the same variables under different operating conditions. These problems can be easily dealt with using the basic performance characteristics to obtain some corollary results that are useful for this purpose. On many occasions, this text takes the time to derive some of these useful relations to allow the student to deal with these common and important problems.

The first chapter provides a historical perspective on the development of electro-mechanical energy conversion devices and starts by tracing the origins of electricity leading up to the fundamental discoveries of the not too distant past. While this topic is not an integral part of the conventional coverage in texts and courses in this

