An introduction to the analysis of electric machines, power electronic circuits, electric drive performance, and power systems

This book provides students with the basic physical concepts and analysis tools needed for subsequent coursework in electric power and drive systems with a focus on Tesla’s rotating magnetic field. Organized in a flexible format, it allows instructors to select material as needed to fit their school’s power program. The first chapter covers the fundamental concepts and analytical methods that are common to power and electric drive systems. The subsequent chapters offer introductory analyses specific to electric machines, power electronic circuits, drive system performance and simulation, and power systems. In addition, this book:

• Provides students with an analytical base on which to build in advanced follow-on courses

• Examines fundamental power conversions (dc-dc, ac-dc and dc-ac), harmonics, and distortion

• Describes the dynamic computer simulation of a brushless dc drive to illustrate its performance with both a sinusoidal inverter voltage approximation and more realistic stator six-step drive applied voltages

• Includes in-chapter short problems, numerous worked examples, and end-of-chapter problems to help readers review and more fully understand each topic
ABOUT THE AUTHOR

Paul C. Krause is Board Chairman of PC Krause and Associates Inc. (PCKA), and a retired Professor of Electrical and Computer Engineering at Purdue University. He has authored or co-authored more than 100 technical papers and is the co-author of *Analysis of Electric Machinery and Drive Systems*, Third Edition (Wiley-IEEE Press), and *Electromechanical Motion Devices*, Second Edition (Wiley-IEEE Press). He is a Life Fellow of the IEEE and was the 2010 recipient of the IEEE Nikola Tesla Award.

Oleg Wasynczuk is Professor of Electrical and Computer Engineering at Purdue University and Chief Technical Officer of PCKA. He has authored or co-authored more than 100 technical papers and is the co-author of *Analysis of Electric Machinery and Drive Systems*, Third Edition (Wiley-IEEE Press), and *Electromechanical Motion Devices*, Second Edition (Wiley-IEEE Press). He is a Fellow of the IEEE and was the 2008 recipient of the IEEE PES Cyril Veinott Electromechanical Energy Conversion Award.

Timothy O’Connell is a Senior Lead Engineer at PCKA, where he leads a multi-member industry modeling and simulation team supporting the design and analysis of more electric aircraft. He has authored or co-authored over 20 technical papers on electric machine analysis and design, aerospace power systems, and modeling and simulation. He is a Senior Member of IEEE.

Maher Hasan is a Senior Lead Engineer at PCKA, where he has led several software development efforts for the simulation of circuits and electromechanical and power systems, and is involved in modeling and simulation in support of multiple efforts. He has authored or co-authored several technical papers in the fields of dynamic simulation and numerical methods.

RELATED RESOURCES

Instructor

View Instructor Companion Site

SERIES

IEEE Press Series on Power and Energy Systems

To purchase this product, please visit https://www.wiley.com/en-us/9781119214274