



# Advanced Power System Analysis and Dynamics

*L.P. Singh*

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## KEY FEATURES:

- \* Material presented is an outcome of teaching computer methods in various power systems to graduate and postgraduate students in electrical engineering.
- \* Provides material in a clear, straight forward and simple style.
- \* Solved examples and flow diagrams are given to understand the concepts.

## ABOUT THE BOOK:

This book is a result of teaching courses in the areas of Computer Methods in Power Systems, Digital Simulation of Power Systems, Power System Dynamics and Advanced Protective Relaying to undergraduate and graduate students in electrical engineering. The present edition includes a sub-section on solution procedure to include transmission losses using dynamic programming in the chapter on Economic Load Scheduling of Power System. In this edition an additional chapter on Load Forecasting has also been included. The present book deals with almost all the aspects of modern power system analysis such as network equations and its formulations, graph theory, symmetries inherent in power system components and its formulations, symmetries inherent in power system components and development of transformation matrices based solely upon symmetries, feasibility analysis and modelling of multi-phase systems, power system modelling including detailed analysis of synchronous machines, induction machines and composite loads, sparsity techniques, economic operation of power systems including derivation of transmission loss equation from the fundamental, solution of algebraic and differential equations and power system studies such as load flow, fault analysis and transient stability studies of a large scale power system including modern and related topics such as advanced protective relaying, digital protection and load forecasting. The book contains solved examples in these areas and also flow diagrams which will help on one hand to understand the theory and on the other hand, it will help the simulation of large scale power systems on the digital computer. The book will be easy to read and understand and will be useful to both undergraduate and graduate students in electrical engineering as well as to the engineers working in electricity boards and utilities etc.

## CONTENTS:

- \* Introduction
- \* Network Formulation
- \* Power System Components and their Representation
- \* Short Circuit Studies
- \* Numerical Solution of Mathematical Equations
- \* Load Flow Studies
- \* Economic Load Scheduling of Power System
- \* Sparsity Technique
- \* Dynamic Analysis and Modelling of Machines
- \* Stability Studies
- \* Multi-Phase (Six-Phase) Systems
- \* Protective Relaying
- \* Digital Relaying Scheme

\* Load Forecasting

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- \* Researchers and engineers from research laboratories, utilities and industries.

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