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Chapter 1 : Pearson - Power Systems Analysis, 2/E - Arthur R. Bergen & Vijay Vittal

Description. For senior/graduate-level courses in Power System Analysis. Keeping pace with the major changes in the structure and operation of the electric utility industry, this is the first text on power system analysis that explores the issues and shows how power system operation will be affected by the changes in the industry.

Transmission and Distribution Systems. The Deregulated Electric Power Industry. Complex Power Supplied to a One-Port. Conservation of Complex Power. Flux Linkages of Infinite Straight Wire. Flux Linkages; Many-Conductor Case. Review of Electric Fields. Determination of Line Parameters Using Tables. Derivation of Terminal V, I Relations. Waves on Transmission Lines. Complex Power Transmission Short Line. Complex Power Transmission Radial Line. Power-Handling Capability of Lines. Transformer Modeling and the Per Unit System. Per Unit Three-Phase Quantities. Per Unit Analysis of Normal System. Transmission Line and Transformers. Generator Modeling I Machine Viewpoint. Power Delivered by Generator. Synchronizing Generator to an Infinite Bus. Application to Synchronous Machine. Exciter System Block Diagram. Stability of Excitation System. Generator Connected to Infinite Bus. Network Reduction Kron Reduction. The Power Flow Problem. Solution by Gauss Iteration. More General Iteration Scheme. Application to Power Flow Equations. Power Control System Modeling. Simplified Analysis of Power Control System. Power Control, Multigenerator Case. Special Case; Two Generating Units.

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Chapter 2 : Power Systems and Evolutionary Algorithms - System I

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Keeping pace with the major changes in the structure and operation of the electric utility industry, this is the first text on power system analysis that explores the issues and shows how power system operation will be affected by the changes in the industry. It incorporates state-of-the-art, computer-based power system analysis and shows students how to apply each modern analysis tool in designing and improving an expansion of an existing power system. Features NEW - Describes the new market environment of the electric utility industry. Introduces students to the changes in the electric utility industry structure, and describes how the restructuring will impact important aspects of power system analysis. Prepares students for what they will encounter in the industry and teaches them techniques to solve problems efficiently. Provides students with the opportunity to apply the tools they encounter in each chapter. This chapter introduces efficient computational techniques to analyze large power systems. Gives students clear illustrations of key issues and provides them with methods to solve complex problems. Helps students to more easily understand the material, and assists professors in explaining the material. New To This Edition Describes the new market environment of the electric utility industry. Transmission and Distribution Systems. The Deregulated Electric Power Industry. Complex Power Supplied to a One-Port. Conservation of Complex Power. Flux Linkages of Infinite Straight Wire. Flux Linkages; Many-Conductor Case. Review of Electric Fields. Determination of Line Parameters Using Tables. Derivation of Terminal V, I Relations. Waves on Transmission Lines. Complex Power Transmission Short Line. Complex Power Transmission Radial Line. Power-Handling Capability of Lines. Transformer Modeling and the Per Unit System. Per Unit Three-Phase Quantities. Per Unit Analysis of Normal System. Transmission Line and Transformers. Generator Modeling I Machine Viewpoint. Power Delivered by Generator. Synchronizing Generator to an Infinite Bus. Application to Synchronous Machine. Exciter System Block Diagram. Stability of Excitation System. Generator Connected to Infinite Bus. Network Reduction Kron Reduction. The Power Flow Problem. Solution by Gauss Iteration. More General Iteration Scheme. Application to Power Flow Equations. Power Control System Modeling. Simplified Analysis of Power Control System. Power Control, Multigenerator Case. Special Case; Two Generating Units. Formulation of the Economic Dispatch Problem. Calculation of Penalty Factors. Use of Symmetrical Components for Fault Analysis. More General Fault Circuit Analysis. Power From Sequence Variables. Generator Models for Sequence Networks. Transformer Models for Sequence Networks. Sequence Representation of Transmission Lines. Assembly of Sequence Networks. Protection of Radial Systems. System with Two Sources. Differential Protection of Generators. Differential Protection of Transformers. Differential Protection of Buses and Lines. Overlapping Zones of Protection. Linearization of Swing Equation. Solution of Nonlinear Swing Equation. Extension to Two-Machine Case. Force Generation in a Solenoid. Method of Lagrange Multipliers. Modification of Impedance Matrices. Backcover Copy Keeping pace with the major changes in the structure and operation of the electric utility industry, this is the first book on power system analysis that explores the issues and shows how power system operation will be affected by the changes in the industry. It incorporates state-of-the-art, computer-based power system analysis and describes how to apply each modern analysis tool in designing and improving an expansion of an existing power system. Introduces changes in the electric utility industry structure, and describes how the restructuring will impact important aspects of power system analysis. Providing readers with the opportunity to apply the tools they encounter in each chapter. Giving the reader clear illustrations of key issues and provides them with methods to solve complex problems. Clearly stated objectives and explanation of material without sacrificing necessary rigor and understanding.

Chapter 3 : Power 2 â€“ Power Unit

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Synopsis. This is the first book on power system analysis to explore the major changes in the structure and operation of the electric utility industry, and to show how power system operation will be affected by the new changes.