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3.5 Overall Discussion of Engineering Systems Goals and Objectives; Summary; Exercises; References; Useful Resources; Part II The Tasks at Each Phase of Systems Development; Chapter 4 Tasks within the Phases of Systems Development; 4.0 Introduction; 4.1 The Task of Description; 4.2 Traditional Tasks of Analyzing Systems in Civil Engineering; 4.3 The Task of System Evaluation; 4.4 The Task of Feedback between Phases; 4.5 Examples of Tasks at Each Phase of Systems Development; Summary; Exercises; References; Part III Tools Needed to Carry Out the Tasks; Chapter 5 Probability; 5.0 Introduction 5.1 Set Theory 5.2 Some Basic Concepts in Probability; 5.3 Random Variables; 5.4 Probability Functions; 5.5 Discrete Probability Distributions; 5.6 Continuous Probability Distributions; 5.7 Common Terminology in Probabilistic Analysis; Summary; Exercises; References; Useful Resources; Chapter 6 Statistics; 6.0 Introduction; 6.1 Population and Sampling; 6.2 Descriptive Statistics; 6.3 Inferential Statistics; 6.4 Hypothesis Testing; 6.5 Some Common Terminology and Concepts in Engineering Statistics; Summary; Exercises; References; Useful Resources; Chapter 7 Modeling; 7.0 Introduction 7.1 Steps for Developing Statistical Models 7.2 Model Specifications in Statistical Modeling; 7.3 Some Important Issues in Statistical Modeling; 7.4 Glossary of Modeling Terms; Exercises; References; Useful Resources; Chapter 8 Simulation; 8.0 Introduction; 8.1 Simulation Terminology; 8.2 Categories of Simulation; 8.3 Random Number Generation; 8.4 Monte Carlo Simulation; Summary; Exercises; References; Useful Resources; Chapter 9 Optimization; 9.0 Introduction; 9.1 Unconstrained Optimization Using Calculus; 9.2 Constrained Optimization Using Calculus 9.3 Constrained Optimization Using Mathematical Programming Techniques

Sommario/riassunto

"Presents an overview of the systems approach to Civil Engineering and makes a case for why it's necessary to consider any civil infrastructure as part of a larger whole. Includes unique coverage of ethics, legal issues and management. Outlines the complete sequence in developing a civil system. Presents the phases of civil systems development, the tasks and challenges faced by the systems engineer at each phase, and the tools needed to carry out these tasks"--
