Numerical Analysis with Applications in Mechanics and Engineering

Description: A much-needed guide on how to use numerical methods to solve practical engineering problems

Bridging the gap between mathematics and engineering, Numerical Analysis with Applications in Mechanics and Engineering arms readers with powerful tools for solving real-world problems in mechanics, physics, and civil and mechanical engineering. Unlike most books on numerical analysis, this outstanding work links theory and application, explains the mathematics in simple engineering terms, and clearly demonstrates how to use numerical methods to obtain solutions and interpret results.

Each chapter is devoted to a unique analytical methodology, including a detailed theoretical presentation and emphasis on practical computation. Ample numerical examples and applications round out the discussion, illustrating how to work out specific problems of mechanics, physics, or engineering. Readers will learn the core purpose of each technique, develop hands-on problem-solving skills, and get a complete picture of the studied phenomenon. Coverage includes:

- How to deal with errors in numerical analysis
- Approaches for solving problems in linear and nonlinear systems
- Methods of interpolation and approximation of functions
- Formulas and calculations for numerical differentiation and integration
- Integration of ordinary and partial differential equations
- Optimization methods and solutions for programming problems

Numerical Analysis with Applications in Mechanics and Engineering is a one-of-a-kind guide for engineers using mathematical models and methods, as well as for physicists and mathematicians interested in engineering problems.

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