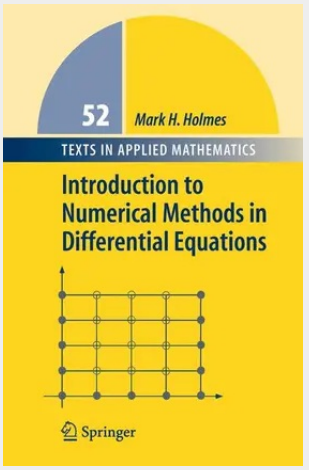
Holmes

Introduction to Numerical Methods in Differential Equations

This book shows students how to derive, test and analyze numerical methods for solving differential equations, including both ordinary and partial differential equations. The objective is that students learn to solve differential equations numerically and understand the mathematical and computational issues that arise when this is done. An essential component of this approach is the extensive collection of exercises, which develop both the analytical and computational aspects of the material. Numerical methods for differential equations are important in a variety of disciplines: most laws of physics involve differential equations, as do the modern theories of financial assets. Moreover many computer animation methods are now grounded in physics-based rules and are heavily invested in differential equations. In addition to more than 100 illustrations, the book includes a large collection of supplemental material: exercise sets, MATLAB computer codes for both student and instructor, lecture slides and movies.

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80,24 €
74,99 € (zzgl. MwSt.)

Nicht mehr lieferbar

Artikelnummer: 9780387308913
Medium: Buch
ISBN: 978-0-387-30891-3
Verlag: Springer
Erscheinungstermin: 24.10.2006
Sprache(n): Englisch
Auflage: 2007. Auflage 2006
Serie: Texts in Applied Mathematics
Produktform: Gebunden
Gewicht: 1170 g
Seiten: 239
Format (B x H): 157 x 241 mm

Kundenservice Verlag Dr. Otto Schmidt KG
Neumannstraße 10, 40235 Düsseldorf | kundenservice@otto-schmidt.de | 0221-93738-997 (Inland)