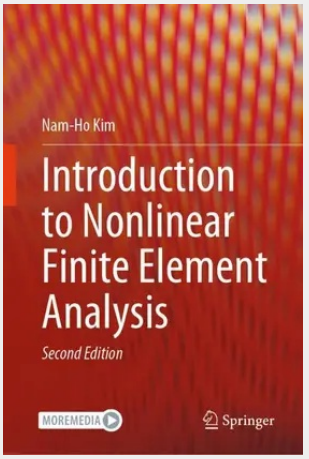
Kim

Introduction to Nonlinear Finite Element Analysis



This new edition introduces the essential concepts of nonlinear finite element analysis (FEA) procedures. The textbook guides students in implementing nonlinear FEA programs and utilizes commercial software to address practical engineering problems. It thoroughly explains the fundamental theories and provides instructions on applying these concepts to tackle various engineering challenges. Rather than covering numerous nonlinear problems, the book focuses on four representative topics: nonlinear elasticity, elastoplasticity, contact problems, and dynamic problems, with an added chapter on nonlinear dynamics. The material is presented independently of any specific software, and the tutorials and examples utilize four commercial programs included in the appendices: ANSYS, NASTRAN, ABAQUS, and MATLAB. The MATLAB section includes all source codes, allowing students to develop material models or different algorithms. This edition introduces 2D plane strain elements, in addition to 3D solid element, with all the aforementioned functionalities. It includes fully integrated frictional contact analysis and explicit and implicit nonlinear dynamic analysis in the MATLAB programs.

Second Edition is designed for graduate students studying mechanical, civil, aerospace, biomedical, and industrial engineering. Researchers and practicing engineers in these disciplines will find it to be an invaluable professional reference.

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117,69 €
109,99 € (zzgl. MwSt.)

Lieferfrist: bis zu 10 Tage

Artikelnummer: 9783032097071
Medium: Buch
ISBN: 978-3-032-09707-1
Verlag: Springer
Erscheinungstermin: 17.02.2026
Sprache(n): Englisch
Auflage: 2. Auflage 2026
Produktform: Gebunden
Gewicht: 926 g
Seiten: 495
Format (B x H): 160 x 241 mm

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