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Nota di contenuto	Introduction to Linear FEM -- Mechanical Quantities of Structural Mechanics -- Mathematical Model Based on Energy Principles -- Discretization Using Finite Elements -- Finite Element Classes -- Mathematical and Numerical Aspects of the FEM -- Linear time-dependent FEM -- Geometric Nonlinearity -- Material Nonlinearity -- Contact Modeling -- Solution of Nonlinear Static Problems -- Time Integration of Nonlinear Dynamic Problems -- Sheet Metal Forming Simulation -- Appendix: Mathematical Tools -- Introduction to Simulation with LS-DYNA® -- Solutions to Exercises.
Sommario/riassunto	This textbook provides a clear and accessible introduction to the characteristics and properties of linear finite elements in the fields of elastostatics and dynamics, and explains the procedures involved in building simulation models. The second part focuses on nonlinear, time-dependent phenomena and their corresponding solution methods. Practical examples from sheet metal forming are illustrated using the LS-DYNA® software. The emphasis is placed on explaining the interrelationships essential for users of commercial simulation software. Theoretical fundamentals are presented to the extent required for understanding how to use such programs effectively. The content Introduction to Linear FEM – Mechanical Quantities of Structural Mechanics – Mathematical Model Based on Energy Principles – Discretization Using Finite Elements – Finite Element Classes –

Mathematical and Numerical Aspects of the FEM – Linear time-dependent FEM – Geometric Nonlinearity – Material Nonlinearity – Contact Modeling – Solution of Nonlinear Static Problems – Time Integration of Nonlinear Dynamic Problems – Sheet Metal Forming Simulation – Appendix: Mathematical Tools – Introduction to Simulation with LS-DYNA® – Solutions to Exercises Target groups Students from bachelor's and master's degree courses in engineering at colleges and technical universities Engineers and technicians The author Prof. Dr.-Ing. Marcus Wagner teaches finite elements, engineering informatics and machine dynamics at the OTH Regensburg, Germany and heads the finite element and machine dynamics laboratories.
