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Nota di contenuto	Cover -- Title Page -- Copyright Page -- Contents -- Preface -- Glossary of Notation -- Chapter 1 Introduction to Meshfree and Particle Methods -- 1.1 Definition of Meshfree Method -- 1.2 Key Approximation Characteristics -- 1.3 Meshfree Computational Model -- 1.4 A Demonstration of Meshfree Analysis -- 1.5 Classes of Meshfree Methods -- 1.6 Applications of Meshfree Methods -- References -- Chapter 2 Preliminaries: Strong and Weak Forms of Diffusion, Elasticity, and Solid Continua -- 2.1 Diffusion Equation -- 2.1.1 Strong Form of the Diffusion Equation -- 2.1.2 The Variational Principle for the Diffusion Equation -- 2.1.2.1 The Standard Variational Principle -- 2.1.2.2 The Variational Equation -- 2.1.2.3 Equivalence of the Variational Equation and the Strong Form -- 2.1.3 Constrained Variational Principles for the Diffusion Equation -- 2.1.3.1 The Penalty Method -- 2.1.3.2 The Lagrange Multiplier Method -- 2.1.3.3 Nitsche's Method -- 2.1.4 Weak Form of the Diffusion Equation by the Method of Weighted Residuals -- 2.2 Elasticity -- 2.2.1 Strong Form of Elasticity -- 2.2.2 The Variational Principle for Elasticity -- 2.2.3 Constrained Variational

	Principles for Elasticity
Sommario/riassunto	This book provides an in-depth exploration of meshfree and particle methods, which are advanced numerical techniques used in computational mechanics. It covers the fundamental principles and applications of these methods, including the construction and analysis of meshfree computational models. The authors discuss various approximation techniques such as the Moving Least Squares (MLS) and Reproducing Kernel approximations, and their applications in solving partial differential equations. The book also addresses the challenges of numerical integration and stability in meshfree methods, presenting solutions like nodal integration and stabilization techniques. Intended for researchers and practitioners in numerical analysis and computational mechanics, this text serves as a comprehensive resource for understanding and implementing meshfree and particle methods.