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| Nota di contenuto | Chapter 1- Preliminaries -- Chapter 2- What is Homogenization and Multiscale? First Examples -- Chapter 3- Brief History and Surprising Examples in Homogenization -- Chapter 4- Formal Two-scale Asymptotic Expansions and the Corrector Problem -- Chapter 5- Compensated Compactness and Oscillating Test-functions -- Chapter 6- Two-scale Convergence -- Chapter 7- Examples of Explicit Effective Coefficients: Laminated Structures and 2D Checkerboards -- Chapter 8- Introduction to Stochastic Homogenization -- Chapter 9- G-Convergence in Nonlinear Homogenization Problems -- Chapter 10- An Example of a Nonlinear Problem: Homogenization of Plasticity and Limit Loads -- Chapter 11- Continuum Limits for Discrete Problems with Fine Scales -- References -- Appendix: Regular and Singular Perturbations and Boundary Layers -- Index. |
| Sommario/riassunto | The objective of this book is to navigate beginning graduate students in mathematics and engineering through a mature field of multiscale |

problems in homogenization theory and to provide an idea of its broad scope. An overview of a wide spectrum of homogenization techniques ranging from classical two-scale asymptotic expansions to Gamma convergence and the rapidly developing field of stochastic homogenization is presented. The mathematical proofs and definitions are supplemented with intuitive explanations and figures to make them easier to follow. A blend of mathematics and examples from materials science and engineering is designed to teach a mixed audience of mathematical and non-mathematical students.
