Modelling of Engineering Materials

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About the Book
This book presents the background that is necessary to understand the mathematical models that govern the mechanical response of engineering materials. The book provides the basics of continuum mechanics. A brief review of simplistic and linear models used to characterize the mechanical response of materials is presented. This is followed by a description of models that characterize the nonlinear response of solids and fluids from first principles. The book outlines the common principles that govern material response of both solids and fluids, within a unified framework. Mechanical response in the presence of non-mechanical fields such as thermal and electrical fields applied to special materials such as shape memory and piezoelectric materials is also explained. Case studies and exercise problems are also carefully designed and presented in the book. The book will be useful in getting a bird’s eye view of the subject matter for graduate students, researchers, practitioners and academicians. It can be worth exploring for CFD/FEM simulators to develop and use appropriate models that can characterize the response of standard and new materials.

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