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Nota di contenuto	Dimensional Analysis -- Perturbation Methods -- Kinetics -- Diffusion -- Traffic Flow -- Continuum Mechanics: One Spatial Dimension -- Elastic and Viscoelastic Materials -- Continuum Mechanics: Three Spatial Dimensions -- Newtonian Fluids -- Appendices.
Sommario/riassunto	The objective of this textbook is the construction, analysis, and interpretation of mathematical models to help us understand the world we live in. Rather than follow a case study approach it develops the mathematical and physical ideas that are fundamental in understanding contemporary problems in science and engineering. Science evolves, and this means that the problems of current interest continually change. What does not change as quickly is the approach used to derive the relevant mathematical models, and the methods used to analyze the models. Consequently, this book is written in such a way as to establish the mathematical ideas underlying model development independently of a specific application. This does not mean applications are not considered, they are, and connections with

experiment are a staple of this book. The book, as well as the individual chapters, is written in such a way that the material becomes more sophisticated as you progress. This provides some flexibility in how the book is used, allowing consideration for the breadth and depth of the material covered. Moreover, there are a wide spectrum of exercises and detailed illustrations that significantly enrich the material. Students and researchers interested in mathematical modelling in mathematics, physics, engineering and the applied sciences will find this text useful. The material, and topics, have been updated to include recent developments in mathematical modeling. The exercises have also been expanded to include these changes, as well as enhance those from the first edition. Review of first edition: "The goal of this book is to introduce the mathematical tools needed for analyzing and deriving mathematical models. … Holmes is able to integrate the theory with application in a very nice way providing an excellent book on applied mathematics. … One of the best features of the book is the abundant number of exercises found at the end of each chapter. … I think this is a great book, and I recommend it for scholarly purposes by students, teachers, and researchers." Joe Latulippe, The Mathematical Association of America, December, 2009.