Mathematica for Theoretical Physics: Classical Mechanics and Nonlinear Dynamics

By Gerd Baumann

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Class-tested textbook that shows readers how to solve physical problems and deal with their underlying theoretical concepts while using Mathematica® to derive numeric and symbolic solutions.

Delivers dozens of fully interactive examples for learning and implementation, constants and formulae can readily be altered and adapted for the user's purposes.

New edition offers enlarged two-volume format suitable to courses in mechanics and electrodynamics, while offering dozens of new examples and a more rewarding interactive learning environment.

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Editorial Review

Review

From the reviews of the second edition:

"The new edition contains a lot of new material and examples … . It is shown how Mathematica can be used to support (or to replace) many of the usual 'by-hand' calculations and to study the results instantaneously by means of graphical representations. In particular, advantage is taken of many special functions and operations … which are available in Mathematica. The book contains many sample programs, in written form." (M. Plum, Zentralblatt MATH, Vol. 1095 (21), 2006)

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From the Back Cover

Mathematica for Theoretical Physics:
Classical Mechanics and Nonlinear Dynamics
This second edition of Baumann's Mathematica® in Theoretical Physics shows readers how to solve physical problems and deal with their underlying theoretical concepts while using Mathematica® to derive numeric and symbolic solutions. Each example and calculation can be evaluated by the reader, and the reader can change the example calculations and adopt the given code to related or similar problems.
The second edition has been completely revised and expanded into two volumes:
The first volume covers classical mechanics and nonlinear dynamics. Both topics are the basis of a regular mechanics course. The second volume covers electrodynamics, quantum mechanics, relativity, and fractals and fractional calculus.
New examples have been added and the representation has been reworked to provide a more interactive problem-solving presentation. This book can be used as a textbook or as a reference work, by students and researchers alike. A brief glossary of terms and functions is contained in the appendices.
The examples given in the text can also be interactively used and changed for the reader's purposes.
The Author, Gerd Baumann, is affiliated with the Mathematical Physics Division of the University of Ulm, Germany, where he is professor. He is the author of Symmetry Analysis of Differential Equations with Mathematica®. Dr. Baumann has given numerous invited talks at universities and industry alike. He regularly hosts seminars and lectures on symbolic computing at the University of Ulm and at TECHNISCHE UNIVERSITÄT MÜNCHEN (TUM), Munich.

Users Review

From reader reviews:

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