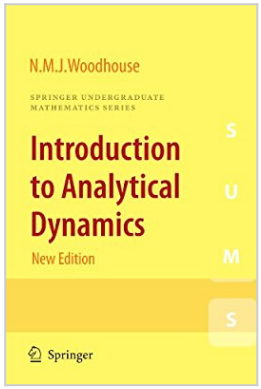

Introduction to Analytical Dynamics (Springer Undergraduate Mathematics Series)

By Nicholas Woodhouse

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First published in 1987, this text offers concise but clear explanations and derivations to give readers a confident grasp of the chain of argument that leads from Newton’s laws through Lagrange’s equations and Hamilton’s principle, to Hamilton’s equations and canonical transformations.This new edition has been extensively revised and updated to include:A chapter on symplectic geometry and the geometric interpretation of some of the coordinate calculations. A more systematic treatment of the conections with the phase-plane analysis of ODEs; and an improved treatment of Euler angles. A greater emphasis on the links to special relativity and quantum theory showing how ideas from this classical subject link into contemporary areas of mathematics and theoretical physics.A wealth of examples show the subject in action and a range of exercises – with solutions – are provided to help test understanding.

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Editorial Review

Review

From the reviews of the second edition:

“It is designed to teach analytical mechanics to second and third year undergraduates in the UK, and probably to third or fourth year undergraduates in the US. … This book offers a very attractive traditional introduction to the subject. … the author is well tuned to the difficulties even strong students encounter. … discusses the relevance of classical mechanics in modern physics, especially to relativity and quantum mechanics. This is a fine textbook. It would be a pleasure to teach or to learn from it.” (William J. Satzer, The Mathematical Association of America, March, 2010)

From the Back Cover

Analytical dynamics forms an important part of any undergraduate programme in applied mathematics and physics: it develops intuition about three-dimensional space and provides invaluable practice in problem solving.

First published in 1987, this text is an introduction to the core ideas. It offers concise but clear explanations and derivations to give readers a confident grasp of the chain of argument that leads from Newton’s laws through Lagrange’s equations and Hamilton’s principle, to Hamilton’s equations and canonical transformations.

This new edition has been extensively revised and updated to include:

- A chapter on symplectic geometry and the geometric interpretation of some of the coordinate calculations.
- A more systematic treatment of the conections with the phase-plane analysis of ODEs; and an improved treatment of Euler angles.
- A greater emphasis on the links to special relativity and quantum theory, e.g., linking Schrödinger’s equation to Hamilton-Jacobi theory, showing how ideas from this classical subject link into contemporary areas of mathematics and theoretical physics.

Aimed at second- and third-year undergraduates, the book assumes some familiarity with elementary linear algebra, the chain rule for partial derivatives, and vector mechanics in three dimensions, although the latter is not essential. A wealth of examples show the subject in action and a range of exercises – with solutions – are provided to help test understanding.

About the Author
Nick Woodhouse is an experienced researcher in GR with an international reputation.

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From reader reviews:

Charles Tebo:

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