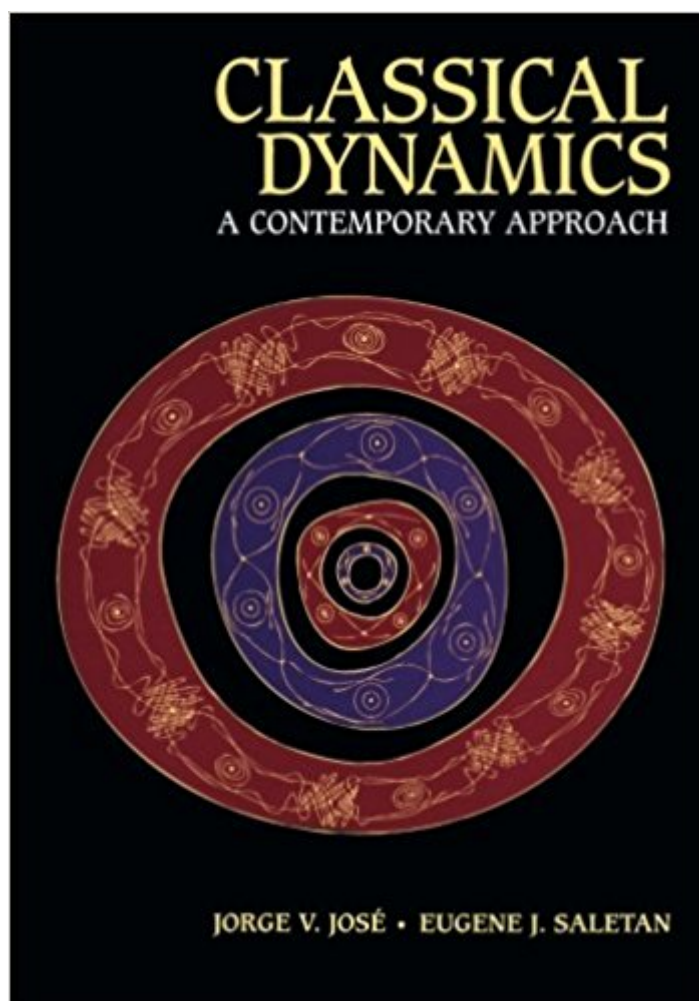


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Classical Dynamics: A Contemporary Approach



Synopsis

Recent advances in the study of dynamical systems have revolutionized the way that classical mechanics is taught and understood. This new and comprehensive textbook provides a complete description of this fundamental branch of physics. The authors cover all the material that one would expect to find in a standard graduate course: Lagrangian and Hamiltonian dynamics, canonical transformations, the Hamilton-Jacobi equation, perturbation methods, and rigid bodies. They also deal with more advanced topics such as the relativistic Kepler problem, Liouville and Darboux theorems, and inverse and chaotic scattering. A key feature of the book is the early introduction of geometric (differential manifold) ideas, as well as detailed treatment of topics in nonlinear dynamics (such as the KAM theorem) and continuum dynamics (including solitons). Over 200 homework exercises are included. It will be an ideal textbook for graduate students of physics, applied mathematics, theoretical chemistry, and engineering, as well as a useful reference for researchers in these fields. A solutions manual is available exclusively for instructors.

Book Information

Paperback: 698 pages

Publisher: Cambridge University Press; 1 edition (August 13, 1998)

Language: English

ISBN-10: 0521636361

ISBN-13: 978-0521636360

Product Dimensions: 7 x 1.4 x 10 inches

Shipping Weight: 3.2 pounds (View shipping rates and policies)

Average Customer Review: 3.4 out of 5 stars 19 customer reviews

Best Sellers Rank: #419,105 in Books (See Top 100 in Books) #111 in Books > Engineering & Transportation > Engineering > Mechanical > Hydraulics #281 in Books > Science & Math > Physics > Mechanics #335 in Books > Science & Math > Physics > Dynamics

Customer Reviews

"...strikes the right balance between physical reasoning and mathematical sophistication, at the same time as it takes the reader to the forefront of active research in the field...can be used as a textbook and as a reference on newer topics in mechanics....The book is nicely typeset and printed on an ivory-colored, heavy-textured paper that is pleasant to the sight and touch, and the illustrations are very good...I highly recommend this book to instructors and students alike." Physics Today "...well written...would serve as an excellent resource for students and faculty alike who wish

to learn many of the most important aspects of the mathematical physics behind the renaissance of classical mechanics." American Journal of Physics"Two hundred homework problems amplify the content and usefulness of the book...Classical Dynamics is excellent for extending one's horizon into nonlinear dynamics, progressing from a very practical discussion of geographical maps into discrete maps, Hénon maps, the twist map, and the Devil's staircase. Indeed, the strength of the text, the emphasis upon 'the language of modern differential geometry,' shows clearly in these areas." Applied Mechanical Review

Classical Dynamics: A Contemporary Approach covers all the material one would expect to find in a standard graduate course. It also deals with more advanced topics such as the relativistic Kepler problem, Liouville and Darboux theorems, and inverse and chaotic scattering. The book features an early introduction of geometric (differential manifold) ideas, as well as detailed treatment of topics in nonlinear dynamics (such as the KAM theorem) and continuum dynamics (including solitons). Containing many worked examples and over 200 homework exercises, it will be an ideal textbook for graduate students of physics, applied mathematics, theoretical chemistry, and engineering, as well as a useful reference for researchers in these fields. A solutions manual is available exclusively for instructors.

Not for the faint at heart. This book uses it all, tensor's, the form's approach and more. This book really is for a post-doc. It does all the background things that most books use smoke and mirror's to do. If the word tensor or one-form's scare you or never heard of, forget this book. This book is not for anyone at, at least the post-doc. level. If you can understand the book 'Geometrical method's of mathematical physics', by Schultz and can understand it then go for it. I would call this book not even at the level of a grad. student but someone who is in their last year of getting a PhD. Sorry, it is true. If you can understand this book, "How much you will have advanced." When you can read this book you can call yourself a Physicist. You can get here but it takes time and a lot of coursework to get here.

A nice book, with modern terminology and up to date. Explains and uses linear forms and is fairly explicit. Covers most subjects, useful for beginners and to look things up.

I bought Jose and Saletan new and the binding fell apart within about a month of light usage (classes started 9/29 and I'm posting on 10/21). Where light usage is being defined as opening the

book, turning pages, reading the pages, and then closing the book. Occasionally the book is open for a few hours on a couple pages while working through a few exercises. Very disappointed that the spine broke, sections of pages became 'unglued' from the spine from the bottom up, and eventually by turning the pages they seem to magically 'unhinge' themselves from the spine/glue. Also note that I, as a student, have been through a lot of text books and have treated them in varying degrees of care (I used Griffith's EM heavily but carefully and it is standing the test of time, while my copy of Shankar's Principles of QM definitely shows the beating I put into it). But this book is by far the easiest and fastest a book has ever fallen apart on me. Bottom Line: This book is too expensive for how quickly and easily it can fall apart.

Nice book. Discuss application of geometry in quite a detail, although not very deep and modern compared to current mathematics development

Mediocre classical dynamics book compared to Classical Dynamics by Merriam and Thornton. Goldstein is an alternative but is not written as well.

Goldstein, Taylor, Landau, and V.I. Arnol'd pale in comparison to this fascinating text that actually tells the STORY of what physics is attempting to do. I feel all too often Bertrand's Theorem is accredited to Goldstein, yet I feel the reasoning and proof of this astounding truth is handled wonderfully in this text. The prose is wonderfully clear and the math is wonderfully utilized. No other text will inspire as much as this text. By far the best part of this text is it serves two purposes. For the educated reader, it can serve as almost a nonfiction popular text to be able to understand the highest level concepts of physics. For the dedicated student, the problems serve as the most advanced stepping stone to becoming an amazing problem solving machine. I feel remorse that in today's education this text is not the standard graduate level text, yet I believe in due time we will see Saletan and Jose become the new Goldstein/Taylor of any classical mechanics course. If this is a reference text to any course you are taking I highly recommend the purchase. The derivations will give you far more insight to the motivations and process to this art of physics. If you are a double major in physics and math I recommend to better half way point between the analysis course you have taken and the reasoning you love of physics. Arnol'd and Landau is more suitable for the more math rigorous student. Taylor and Goldstein is best for one who wishes to utilize only as high as vector calc for lengthy derivations. But what about the students that lie in the limbo of right in between math rigor and physical reasoning? This is your text! You will see no black squares at the

end of proofs (much like David Hilbert's novels on geometry), yet if read slowly you will have the arms to explain the arguments to laymen. In contemporary days we are at a disconnect of math text and physics text. You can spend two years proving problems in analysis related to differential manifolds, Lie algebras, harmonic analysis, and convergence in a graduate mathematics degree. But until you see these concepts grow naturally from fairly simple questions about how things move you, will not understand the implications beyond connecting definition and discovering fancy algebra tricks. Beware readers, this text may change your entire academic goal set. P.S. The greatest problems in this book are between the lines of this book. There are key steps left out of derivation only because they would take up a lot of space and are just math muscle exercises. But if you do calculate these awful integrals and you do take these nasty derivatives you will be able to tackle any problem in the book. The best part is, you will WANT to calculate these steps as the writing will draw you up in the narrative to truly prove it.

The book is fantastic, but the printing seems lower than average quality. The words in my book appear dull in the same way as when a printer is about to run out of ink.

Classical mechanics is an age-old subject that has been around since centuries. So, it makes sense to use the modern language of differential geometry and topology to present a new perspective on this topic. This is an admirable principle but it is not at all well implemented in Jose & Saletan's book. The sections on Physics are mundane and are almost completely devoid of physical insight. The chapter on Hamilton-Jacobi equations is a good example of endless equations coupled to zero intuition. Secondly, the mathematical sections are a complete outrage. By trying to explain concepts such as tangent bundles, etc in a "physical" fashion, most of the rigour is sacrificed and what is worse, it can often lead erroneous conclusions. Some sections in the book are better than others, but, for the most part this remains a disappointing read. Far too much of the book, for a graduate text, spends time on the same old stuff, instead of expanding the chapters on Non-linear dynamics and Classical field theory. For those who are looking to learn essentially the same content in a slightly more readable fashion, Goldstein is a decent choice. But, if you truly wish to learn classical mechanics using all the formal rigour and beauty of mathematics, then there is only one book that comes to mind - V. Arnold's excellent tome.

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