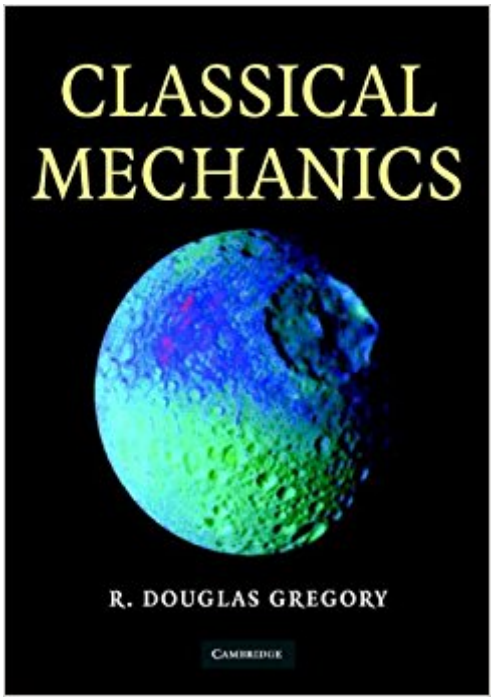
Classical Mechanics



Synopsis

Gregory’s Classical Mechanics is a major new textbook for undergraduates in mathematics and physics. It is a thorough, self-contained and highly readable account of a subject many students find difficult. The author’s clear and systematic style promotes a good understanding of the subject: each concept is motivated and illustrated by worked examples, while problem sets provide plenty of practice for understanding and technique. Computer assisted problems, some suitable for projects, are also included. The book is structured to make learning the subject easy; there is a natural progression from core topics to more advanced ones and hard topics are treated with particular care. A theme of the book is the importance of conservation principles. These appear first in vectorial mechanics where they are proved and applied to problem solving. They reappear in analytical mechanics, where they are shown to be related to symmetries of the Lagrangian, culminating in Noether’s theorem.

Book Information

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Customer Reviews

I am a physicist and I have been working as a Physics teacher in a high school for many years so I need to remember few topics and for sure this book looks the best point to start. Also I really appreciate that this ones has ANSWERS, otherwise how do you know if you are moving in the right direction?

This is THE BEST text in classical mechanics for undergrads I have ever seen! The author is a genius in explanation. I am a total bitch when I review books so a highly positive review from me does mean something. By the way I am a PhD student in physics so I have a very clear idea how the topics I understand should be explained and this author always hit the target right on.I've mainly read the analytical mechanics chapters 12-14. For the first time I understood clearly the meaning of Dalambert principle, which was glossed over by my grad courses - I never got it what the difference is between real and virtual displacements untill this book. The text is very close to the historical treatment of Lagrange equations by Lagrange himself. Clear distinction is made between holonomic and non-holonomic constraints, static and moving. Variational principles are presented as reformulation of Lagrange equation. Again very clear treatment of Legendre transformation to get the Hamiltonian. It would be very exciting to see how this author would treat even higher level topics in classical mechanics like Hamilton-Jacobi theory etc, the topics in the well known text, The Variational Principles of Mechanics, by Lanczos.From browsing the other sections, absolutely everything contained in this book is clearly explained in the right way. Numerous examples and diagrams all over the place. Smart problems with answers at the end of the book.Last, Classical mechanics courses are traditionally more heavy on math so unprepared readers (obvously confusing this text with introductory physics course) should not complain if that marvelous book doesn't fit their bill.

The explanations are wonderfully clear and insightful. The examples are illuminating. He has answers to questions in the back of the book.The sections on analytical mechanics are particularly excellent.All in all, ideal for self study. I would buy any future book by this author sight unseen. This book sets a new bechmark for undergraduate physics text books.

This text book is an excellent resource for any Undergraduate. The author expresses the material in a clear and coherent way, which doesn't leave the student, namely me, befuddled. The greatest thing about this book is the number and quality of the examples it provides, which give real world

examples that make the information interesting. Overall, it is an excellent text book, and a great resource for any student.Very Well Done!!An Excellent Choice!

This is the best mechanics textbook I've found for actually learning the subject. The text is well set out and easy to read and there are LOTS of examples with full solutions. Once I'd studied these I found I could do most of the problems. Another good thing is that the book gives the answers to ALL the problems, not just a select few which can be very frustrating. I give this textbook a grade A (and so do the Mathematical Association of America whose review has just appeared on their web site [...]).

This sophomore-level book on classical particle mechanics assumes aknowledge of basic mechanics that one would acquire in a freshmanlevel introductory physics course as well as ordinary differentialequations and vector calculus. Beyond that, it's largely self-contained, and follows the standard fair of Newtonian linear vectormechanics, oscillations, energy methods, curvilinear motion, andintroductory Lagrangian and Hamiltonian mechanics. It also offersintroductory material on some non-conventional subjects such asnon-linear oscillations and phase space, perturbation theory,rotating reference frames, and tensor algebra, which may proveuseful in later course work.Gregory is a professor of applied mathematics, not physics, and itshows in his approach to mechanics. Usually, whether in developingthe theory or demonstrating problem solving techniques in examples,he offers a purely mathematical solution, with no reference to theactual physics of the phenomena. The end-of-chapter problemsrequire mathematical knowledge for their solution, but do notencourage physical thinking about the systems involved. Often, theproblems are entirely un-physical; for example, he might state that"given a force field described by F= 3x^3 + 2x +5, find the vectorpotential", without describing what physical system might actuallyproduce such a field. In other instances, a physical system isdescribed, but it is a contrived one that would probably never beencountered in the lab or in industry. Such an approach does nottend to increase one's physical intuition, which is an importantpart of learning physics.If you are looking for an introductory book to mathematicalmechanics, however, Gregory's text is ok. It's not rigorous -often mathematical hand waving or heuristic arguments are made inthe development of the theory, and sometimes he skips too manysteps, making it very difficult to figure out how he got from stepA to step B, but in most instances his explanations arecomprehendible. The difficulty level of the problems is generallyappropriate, ranging from plug-and-chug to challenging. Also, theproblems are generally fun, even if they do tend to be un-physical.Answers to all of the problems

are given in the back of the book.Overall, I'd say that if mathematical rigor and elegance are whatyou are looking for or, on the other hand, you want to developphysical insight, you are better off looking elsewhere. If youwant a fairly entertaining, understandable, casual introduction tomathematical mechanics, Gregory's book will meet your needs. Ialso would say that this book is pretty appropriate for self-instruction, especially if you can obtain a copy of the solutionsmanual (which is available from admittedly dubious sources on theinternet).

Very well written and with a very appropriate selection of subjects, but is missing some issue about the theory of relativity. If it would be included in a second edition, it would be for me a 'five star'.

This is an excellent textbook.Very good examples and instructive problems. Also,an attractive book with beautiful diagrams.If you are a student or anyone interested in classical mechanics,take a good look at this book.I think you will like it.

Engineering Science) Correlations and Entropy in Classical Statistical Mechanics (International series of monographs in natural philosophy) (English and French Edition) Classical Mechanics (3rd Edition) Introduction to Classical Mechanics: With Problems and Solutions Classical Mechanics: 2nd Edition (Dover Books on Physics)