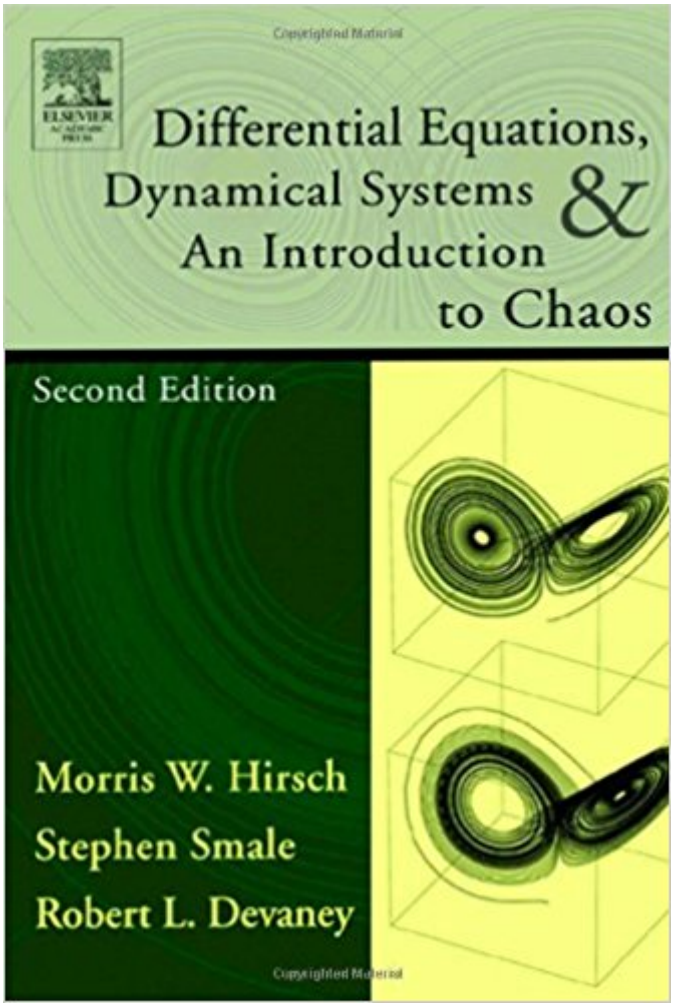
Differential Equations, Dynamical Systems, And An Introduction To Chaos, Second Edition (Pure And Applied Mathematics)



Synopsis

Thirty years in the making, this revised text by three of the world's leading mathematicians covers the dynamical aspects of ordinary differential equations. it explores the relations between dynamical systems and certain fields outside pure mathematics, and has become the standard textbook for graduate courses in this area. The Second Edition now brings students to the brink of contemporary research, starting from a background that includes only calculus and elementary linear algebra.The authors are tops in the field of advanced mathematics, including Steve Smale who is a recipient of the Field's Medal for his work in dynamical systems. * Developed by award-winning researchers and authors* Provides a rigorous yet accessible introduction to differential equations and dynamical systems* Includes bifurcation theory throughout* Contains numerous explorations for students to embark uponNEW IN THIS EDITION* New contemporary material and updated applications* Revisions throughout the text, including simplification of many theorem hypotheses* Many new figures and illustrations* Simplified treatment of linear algebra* Detailed discussion of the chaotic behavior in the Lorenz attractor, the Shil'nikov systems, and the double scroll attractor* Increased coverage of discrete dynamical systems

Book Information

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Customer Reviews

You should be aware that there are two similar books with similar titles by the same authors. The old edition is a hardcover all green book by Hirsch and Smale called:"Differential Equations,

Dynamical Systems and Linear Algebra"The second with the lorenz attractors in yellow on the cover is by Hirsch, Smale and Devaney and is called:"Differential Equations, Dynamical Systems and an Introduction to Chaos"Now, that may be obvious to you, but it is important to note that because those are VERY different books (which I have both of right here). The 'old' one is a more theoretical text that mainly addresses linear systems and is organized more like a math monograph than a contemporary (i.e. with pictures and examples) textbook. It is difficult for most people. The newer version is COMPLETELY different and is written for a more diverse audience. It starts with linear systems but then goes into nonlinear systems and discrete systems. It is somewhat similar in character to Strogatz's Nonlinear Dynamics and Chaos. If you do not have a very strong abstract theoretical type of math background I would not recommend you start learning about differential equations from the "old" edition. You will find it very difficult. If you are used to a general abstract presentation of results you should be fine. For the NEW edition the level is very different. I would guess that courses in multi-variable calc, elementary diff eq, and linear algebra (if you understood them) would be sufficient preparation. Both books are excellent, just be clear on what you are looking for.

This is a great introduction to the next stage of differential equations after a first course. Devaney is a master of presenation, and makes everything seem easy. It is not as encyclopedic as some other books on this material, such as Arnold and Perko, but it is easier to read and still covers the most important advanced material.

I bought a copy of this new book and I have its old version with Hirsch and Smale as its only authors. Main differences between these books are some new chapters covering chaos and the exercises. Old version has better chapters dealing with linear algebra. I find this new version hard to read and it leaves many details to be filled by the reader. I would say that the new version is still a good choice for a second course in ODE or supplementary text for a graduate course. I gave it four stars.

I took a theoretical course in differential equations and we happened to use this book. I was always told this was a really good book and such, but I just didn't like it. I'm not sure what it is (I'm not a huge fan of differential equations so maybe I'm biased), but I just didn't feel like I connected with the book ever. I didn't cover it all, only Chapters 1-9 and chapter 17 and I did think chapter 17 was covered very nicely (Existence and Uniqueness Theorems), but the other stuff which was mainly on

planar systems not so well. I plan on re-reading the book again just to see if I'm just missing the entire picture because one of the authors is Stephen Smale and so I would expect good things from it all. I'll edit my review then and see if anything has changed.

this is an excellent introduction for beginners. in fact, this reference has explained the differential equations, the dynamical system and the chaos as clear as possible. the elementary mathematical analysis, the matrix analysis and ordinary differential equation should be mastered before starting on this book.

to Differential Equations and Their Applications (Dover Books on Mathematics) An Introduction to Ordinary Differential Equations (Dover Books on Mathematics)