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★**Differential equations, mechanics, and computation.**

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This is a book for undergraduate students who would like to learn about differential equations. It is not a classical book; rather, it presents a modern approach to classical subjects. Though rigorous, it gives an intuitive view of the concepts, and the ideas behind the results are well explained. Technical questions are referred to the appendices or to other books. Based on their experience, the authors emphasize and explain the delicate concepts or notations with which people normally have difficulties. In this way, the text could be used as a technical book, but overall it would be very good complementary material. Apart from theorems and proofs one can find illustrative comments, outlines of the proofs, and references to real problems, models and examples.

The book does not contain many illustrations because it has a companion website where the reader can find additional material, such as 2D and 3D visualizations. The idea of combining the website and the book is very good because the website is able to present more spectacular graphics and animations overall. It also allows one to play with the examples. In my opinion such a very good idea should be exploited more.

The first chapter of the book is devoted to the introduction of differential equations and their solutions. Special types of solutions that play an important role in the description and analysis of a flow are presented. The notions of chaos and invariance are introduced in this chapter, right at the beginning of the book.

Chapter 2 deals with linear differential equations. The concept of asymptotic stability is studied. On the one hand, the harmonic motion is considered as an example to analyze. On the other hand, the exponential growth is treated and related to ecological models.

The subjects of Chapter 3 are second-order ordinary differential equations and the calculus of variations. The study of higher-order differential equations is reduced to the case of first-order equations in the corresponding tangent bundle; thus, the results from Chapter 1 can be directly applied. As a model, the Euler-Lagrange equations are explained, stating the basis for the study of classical mechanics. The subject of Chapter 4 is Newtonian mechanics.

Finally, some numerical methods to approximate the solution of initial value problems are explained in Chapter 5.

Reviewed by *Patricia Yanguas*