This text is a clearly written and complete introductory study of differential equations and their applications. Suitable for a one- or two-semester course on the subject, the material is fully comprehensible to anyone who has studied college-level calculus. This book distinguishes itself from other differential equation texts through its application of the subject matter to fascinating events and its incorporation of relatively recent developments in the field. Some applications include

- a proof that the painting, "Disciples at Emmaus," bought by the Rembrandt Society of Belgium was a modern forgery;
- a mathematical explanation of the Tacoma Bridge disaster;
- a model of the blood glucose regulatory system which leads to a criterion for the diagnosis of diabetes;
- an explanation of why the predator portion (sharks, skates, rays, etc.) of all fish caught in the port of Fiume, Italy, rose dramatically during the years of World War I;
- a mathematical verification of Darwin's law that "the more similar two species are, the fiercer is the struggle for existence between them."

An introduction to bifurcation theory, computer programs in C, Pascal, and Fortran, and many original and challenging exercises contribute to the quality of this text.

ISBN 0-387-97894-1

EAN

9 780387 978949 >

Contents

Chapter 1

First-order differential equations 1