



Topics in Applied Mathematics and Modeling

Concise Theory with Case Studies

Oscar Gonzalez

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The analysis and interpretation of mathematical models is an essential part of the modern scientific process. *Topics in Applied Mathematics and Modeling* is designed for a one-semester course in this area aimed at a wide undergraduate audience in the mathematical sciences. The prerequisite for access is exposure to the central ideas of linear algebra and ordinary differential equations.

The subjects explored in the book are dimensional analysis and scaling, dynamical systems, perturbation methods, and calculus of variations. These are immense subjects of wide applicability and a fertile ground for critical thinking and quantitative reasoning, in which every student of mathematics should have some experience. Students who use this book will enhance their understanding of mathematics, acquire tools to explore meaningful scientific problems, and increase their preparedness for future research and advanced studies.

The highlights of the book are case studies and mini-projects, which illustrate the mathematics in action. The book also contains a wealth of examples, figures, and regular exercises to support teaching and learning. The book includes opportunities for computer-aided explorations, and each chapter contains a bibliography with references covering further details of the material.

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This series was founded by the highly respected mathematician and educator, Paul J. Sally, Jr.

