

Introduction to MODELING IN PHYSIOLOGY AND MEDICINE

This unified physiological modeling textbook is for students taking modeling and physiological courses in biomedical engineering and the biological and life sciences. It provides a complete introduction to the foundations, theory and practice of modeling and simulation in medicine, bioscience and engineering, and for clinical applications.

Introduction to Modeling in Physiology and Medicine, Second Edition, develops a clear understanding of the fundamental principles of good modeling methodology, with applied biomedical engineering and bioscience examples. It includes coverage of modeling data, modeling systems, linear and nonlinear systems, model identification, parametric and non-parametric models, and model validation. Readers are shown how to create valid mathematical models which can be applied across a range of disciplines. Learning objectives are supported throughout the book by detailed explanations, extensive case studies, worked examples, and applications.

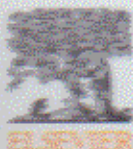
New to this Edition:

- Provides clear guidance on the mathematical prerequisites needed to achieve the maximum benefit from chapter materials
- Offers extensive details regarding basic approaches to modeling, particularly in the Nonlinear and Stochastic Modeling sections
- Includes a substantially extended range of case study materials, with examples drawn from recent research experience
- Key Examples include: A cellular model of insulin secretion and its extension to the whole-body level; a model of insulin action during a meal/oral glucose tolerance test; a large-scale simulation model of type 1 diabetes and its use in *in silico* clinical trials and drug trials.

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