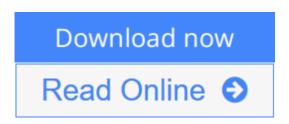# Optimal Control Applied to Biological Models (Chapman & Hall/CRC Mathematical and Computational Biology)

By Suzanne Lenhart, John T. Workman

Optimal Control Applied to Biological Models (Chapman & Hall/CRC Mathematical and Computational Biology) By Suzanne Lenhart, John T. Workman

From economics and business to the biological sciences to physics and engineering, professionals successfully use the powerful mathematical tool of optimal control to make management and strategy decisions. Optimal Control Applied to Biological Models thoroughly develops the mathematical aspects of optimal control theory and provides insight into the application of this theory to biological models.

Focusing on mathematical concepts, the book first examines the most basic problem for continuous time ordinary differential equations (ODEs) before discussing more complicated problems, such as variations of the initial conditions, imposed bounds on the control, multiple states and controls, linear dependence on the control, and free terminal time. In addition, the authors introduce the optimal control of discrete systems and of partial differential equations (PDEs).

Featuring a user-friendly interface, the book contains fourteen interactive sections of various applications, including immunology and epidemic disease models, management decisions in harvesting, and resource allocation models. It also develops the underlying numerical methods of the applications and includes the MATLAB® codes on which the applications are based.

Requiring only basic knowledge of multivariable calculus, simple ODEs, and mathematical models, this text shows how to adjust controls in biological systems in order to achieve proper outcomes.

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Editorial Review

About the Author
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