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Collana	Mathematics for Sustainable Developments, , 3004-9024
Disciplina	304.2
Soggetti	Sustainability Mathematical models Epidemiology Dynamics Population biology Ecology Mathematical Modeling and Industrial Mathematics Dynamical Systems Population Dynamics Theoretical and Statistical Ecology Biologia Models matemàtics Desenvolupament sostenible Llibres electrònics
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Nota di contenuto	Studying the Evolution of Tuberculosis: An Optimal Control Analysis of a Reaction–Diffusion Model -- COVID-19 Transmission Model: Analysis and Multiple Control Strategies -- A Modified Lax–Wendroff Scheme for Constructing a Barycentric Interpolation Approximation of Interface Solutions -- Fractional Holling Type III Tri-Species Dynamics: Dual Fear, Prey Refuge, Intra- and Inter-Species Competitions -- Internet of Things (IoT)-Based Sustainable Agriculture: A Smart Irrigation System Using Embedded System and Web Sockets -- Mathematical Models and

Methods to Real-Life Problems with Examples -- The Awareness Impact on a Delayed Stochastic Epidemic Model with Logistic Growth and Saturated Incidence -- Optimal Control of a Stochastic SVIR Model with Logistic Growth and Saturated Incidence Function -- Ergodic Properties of a Stochastic SEIS Epidemic Model with Logistic Birth and Saturated Incidence -- Investigating the Nonlinear Behavior of a Predator–Prey Model: A Bifurcation Analysis Approach -- A Mathematical Model for the Impacts of Vaccination and Quarantine on the Dynamics of Covid-19 Pandemic: Deterministic and Stochastic Analysis -- Bioheat Transfer: A Theoretical Model Development Study -- Stochastic Dynamical Analysis for a Delayed SIQS Infectious Disease Model with Lévy Jumps and Media Coverage -- On Global Convergence of Single-Step Simultaneous Scheme for Nonlinear Bagley-–Torvik Fractional Differential Equation -- Artificial Neural Network Based Single-Step Method for Solving Biomedical Engineering Application -- Dynamics on Stationary Distribution and Probability Density Function of a (2n + 2) Multi-strain Stochastic Epidemic Model -- Deep Learning Approach for Micromagnetism Modeling -- Global Dynamics of a Fractional-order Covid-19 Epidemic Model with a Nonlinear Incidence Rate.

Sommario/riassunto

This edited book provides a comprehensive framework for the integration of mathematical methodologies into biological research, emphasizing applications that directly address topics related to SDG 3 (Good Health and Well Being) and SDG 6 (Clean Water and Sanitation). From the mathematical modeling of infectious diseases to the design of smart agricultural systems, each chapter presents key global issues where mathematical analysis is a powerful tool for driving progress. This work emphasizes the importance of mathematical models in predicting outcomes, optimizing interventions and understanding the dynamics of complex biological systems. The central theme of the book is the application of mathematical methods, ranging from deterministic models, stochastic processes, fractional calculus and machine learning algorithms to biological problems, framed in the context of sustainability. Each chapter is crafted to showcase how mathematical models not only enhance our understanding of biological phenomena but also play a pivotal role in developing solutions to global issues such as pandemics, environmental degradation and resource management.