

DOCTOR OF PHILOSOPHY

MATHEMATICAL MODELING USING MATLAB

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Mathematical modeling forms a bridge between the study of mathematics and the application of mathematics with the intent of explaining or predicting real world behavior. In their book *A First Course in Mathematical Modeling*, Frank R. Giordano, Maurice D. Weir, and William P. Fox provide an introduction to the entire modeling process. Model verification, an important step in the modeling process, often requires the analysis of vast amounts of data, making computational support essential. *Mathematical Modeling Using MATLAB* acts as a companion resource to *A First Course in Mathematical Modeling* with the goal of guiding the reader to a fuller understanding of the modeling process through the employment of MATLAB's powerful computational capabilities. In it, the reader is led through a series of examples, each building upon the previous, which apply MATLAB's computational power to various modeling scenarios. While not intended as a text in modeling, *Mathematical Modeling Using MATLAB* is a useful resource for the novice modeler interested in tackling problems too large to be performed manually.

DoD KEY TECHNOLOGY AREA: Modeling and Simulation

KEYWORDS: Mathematical Modeling, Discrete Dynamical Systems, Proportionality, Model Fitting