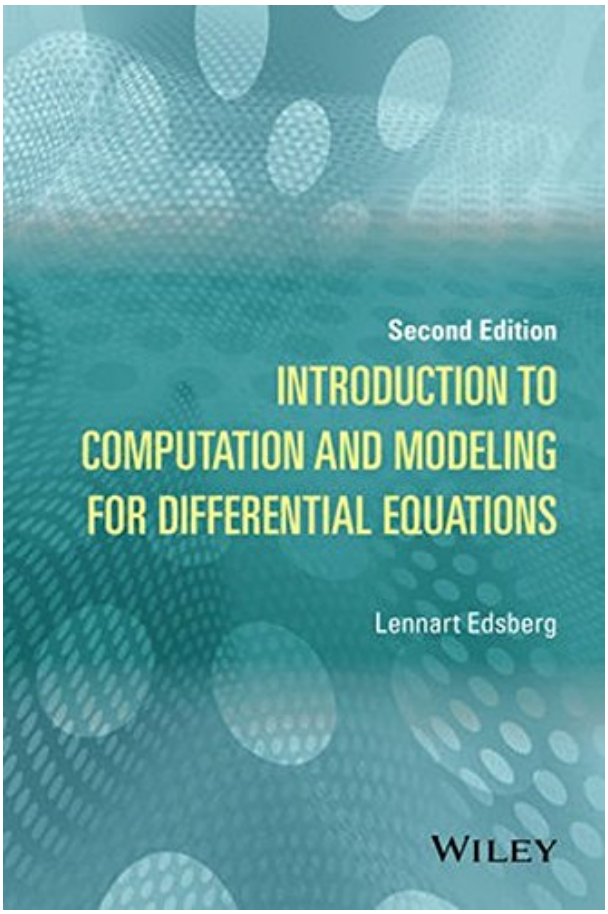
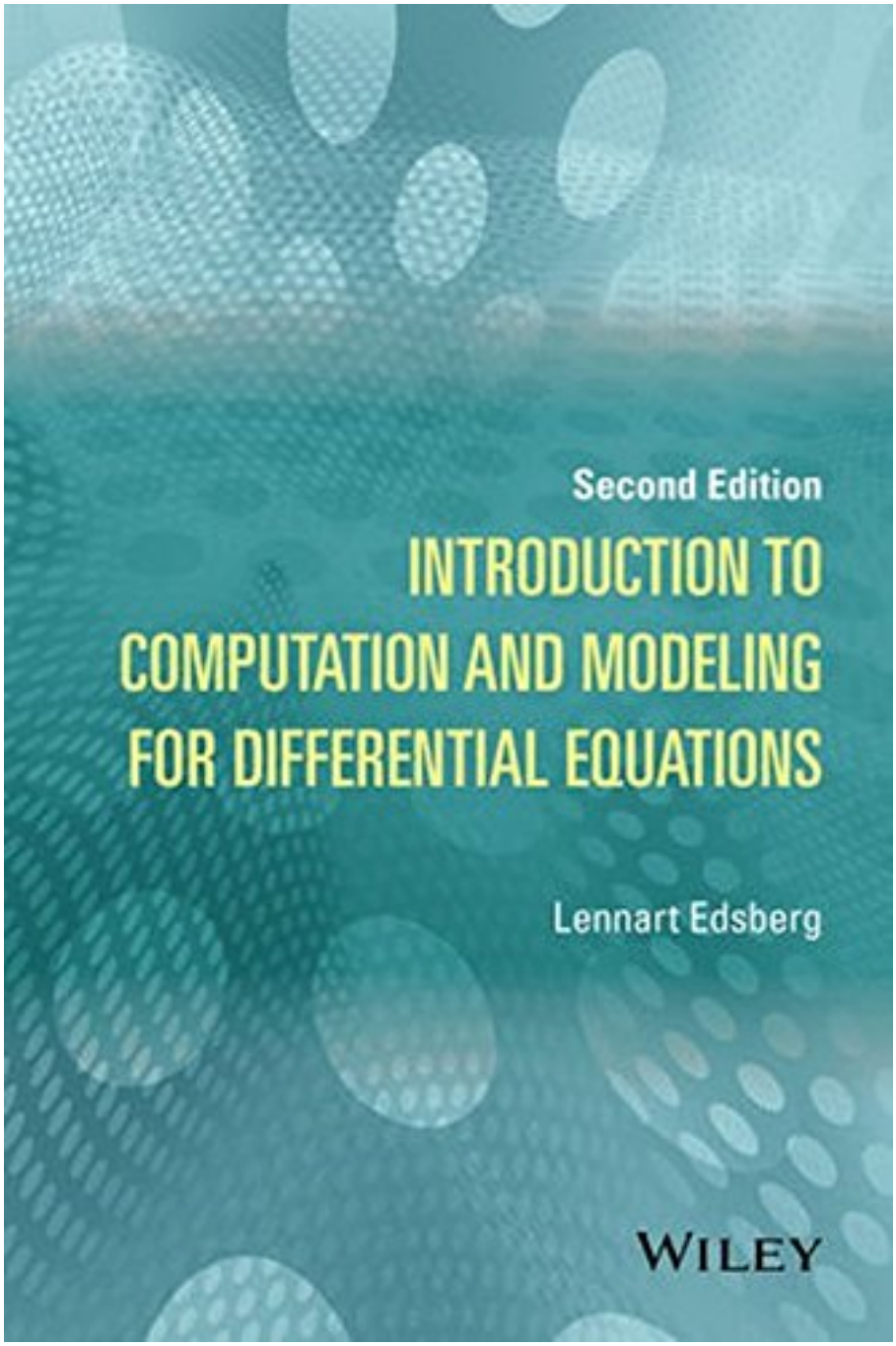
INTRODUCTION TO COMPUTATION AND MODELING FOR DIFFERENTIAL EQUATIONS BY LENNART EDSBERG





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Introduction to Computation and Modeling for Differential Equations, Second Edition features the essential principles and applications to problem solving across disciplines such as engineering, physics, and chemistry. The Second Edition integrates the science of solving differential equations with mathematical, numerical, and programming tools, specifically with methods involving ordinary differential equations; numerical methods for initial value problems (IVPs); numerical methods for boundary value problems (BVPs); partial differential equations (PDEs); numerical methods for parabolic, elliptic, and hyperbolic PDEs; mathematical modeling with differential equations; numerical solutions; and finite difference and finite element methods.

The author features a unique "Five-M" approach: Modeling, Mathematics, Methods, MATLAB®, and Multiphysics, which facilitates a thorough understanding of how models are created and preprocessed mathematically with scaling, classification, and approximation and also demonstrates how a problem is solved numerically using the appropriate mathematical methods. With numerous real-world examples to aid readers in the visualization of the solutions, Introduction to Computation and Modeling for Differential Equations, Second Edition includes:

- New sections on topics such as variational formulation, the finite element method, examples of discretization, Ansatz methods for parabolic PDEs and elliptic PDEs, Galerkin's method for the model problem, and finite volume methods
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