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Volume 1: Mathematical Analysis
JEFFREY HUMPHERYS, TYLER J. JARVIS, AND EMILY J. EVANS

"Humpherys, Jarvis, and their collaborators are in the process of achieving something extraordinary: the creation of an entire curriculum of rigorous graduate-level applied mathematics with a four-volume series of first-rate books to support it."
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In addition to the standard topics, this text includes several key concepts of modern applied mathematical analysis that should be, but are not typically, included in advanced undergraduate and beginning graduate mathematics curricula. This material is the introductory foundation upon which algorithm analysis, optimization, probability, statistics, differential equations, machine learning, and control theory are built. When used in concert with the free supplemental lab materials, this text teaches students both the theory and the computational practice of modern mathematical analysis.

Subject areas: Linear algebra and matrix theory; real and complex analysis; numerical analysis; functional analysis

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Third Edition
DESMOND J. HIGHAM AND NICHOLAS J. HIGHAM

This third edition of MATLAB Guide completely revises and updates the best-selling second edition and is more than 25 percent longer. It remains a lively, concise introduction to the most popular and important features of MATLAB and the Symbolic Math Toolbox. The new edition contains color figures throughout, includes pithy discussions of related topics in new “Asides” boxes that augment the text, has new chapters on the Parallel Computing Toolbox, object-oriented programming, graphs, and large data sets, covers important new MATLAB data types such as categorical arrays, string arrays, tall arrays, tables, and timetables, contains more on MATLAB workflow, including the Live Editor and unit tests, and fully reflects major updates to the MATLAB graphics system.

Used in these courses: Introduction to Numerical Computing (University of New Mexico); Chemical Engineering Control and Process Safety (Columbia University); Introduction to Numerical Analysis (North Carolina State University); and more.

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MARK ASCH, MARC BOCQUET, MAËLLE NODET
Fundamentals of Algorithms 11
This textbook places data assimilation into the broader context of inverse problems and the theory, methods, and algorithms that are used for their solution. It provides a framework for, and insight into, the inverse problem nature of data assimilation, emphasizing “why” and not just “how.” Methods and diagnostics are emphasized, enabling readers to readily apply them to their own field of study. The core audience is advanced undergraduate and early graduate students in applied mathematics, environmental sciences, and any domain that deals with inverse problems related to physical measurements.

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Revised Edition
JAMES D. MEISS
Mathematical Modeling and Computation 22
Differential equations are the basis for models of any physical systems that exhibit smooth change. This book combines much of the material found in a traditional course on ordinary differential equations with an introduction to the more modern theory of dynamical systems. Applications of this theory to physics, biology, chemistry, and engineering are shown through examples in such areas as population modeling, fluid dynamics, electronics, and mechanics. Revisions include an expanded introduction to function spaces and additional exercises.

Used in these courses: Ordinary Differential Equations (Case Western Reserve University, Duke University); Dynamical Systems (Colorado State University, Rochester Institute of Technology); and more.
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LIQUN QI AND ZIYAN LUO
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LARS ELDÉN
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C. T. KELLEY
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