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First Semester in Numerical Analysis with Julia Jones & Bartlett Learning
A FIRST COURSE IN DIFFERENTIAL EQUATIONS WITH

MODELING APPLICATIONS, 10th Edition strikes a balance between the analytical, qualitative, and quantitative approaches to the study of differential equations. This proven and accessible text speaks to beginning engineering and math students through a wealth of pedagogical aids, including an abundance of examples, explanations, Remarks boxes, definitions, and group projects. Written in a straightforward, readable, and helpful style, this book provides a thorough treatment of boundary-value problems and partial differential equations.

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A First Course in Optimization

SIAM

This work addresses the increasingly important role of numerical methods in science and engineering. It combines traditional and well-developed topics with other material such as interval arithmetic, elementary functions, operator series, convergence acceleration, and continued fractions.

Numerical Analysis

Cambridge University Press

Computers and computation are extremely important components of physics and should be integral parts of a physicist's education. Furthermore, computational physics is reshaping the way calculations are made in all areas of physics. Intended for the physics and engineering students who have completed the introductory physics course, A First Course in Computational Physics, Second Edition covers the different types of computational problems using MATLAB with exercises developed around problems of physical interest. Topics such as root finding, Newton-Cotes integration, and ordinary differential equations are included and presented in the context of physics problems. A few topics rarely seen at this level such as computerized tomography, are also included. Within each chapter, the student is led from relatively elementary problems and simple numerical approaches through derivations of more complex and sophisticated methods, often culminating in the solution to problems of significant difficulty. The goal is to demonstrate how numerical methods are used to solve the problems that physicists face. Read the review published in Computing in

Science & Engineering magazine, March/April 2011 (Vol. 13, No. 2) © 2011 IEEE, Published by the IEEE Computer Society

A First Course in Scientific Computation World Scientific Give Your Students the Proper Groundwork for Future Studies in Optimization A First Course in Optimization is designed for a one-semester course in optimization taken by advanced undergraduate and beginning graduate students in the mathematical sciences and engineering. It teaches students the basics of continuous optimization and helps them better understand the mathematics from previous courses. The book focuses on general problems and the underlying theory. It introduces all the necessary mathematical tools and results. The text covers the fundamental problems of constrained and unconstrained optimization as well as linear and convex programming. It also presents basic iterative solution algorithms (such as gradient methods and the Newton–Raphson algorithm and its variants) and more general iterative optimization methods. This text builds the foundation to understand continuous optimization. It prepares students to study advanced topics found in the author's companion book, Iterative Optimization in Inverse Problems, including sequential unconstrained iterative optimization methods.

Initial Value Problems Cambridge University Press

This book serves as a set of lecture notes for a senior undergraduate level course on the introduction to numerical computation, which was developed through 4 semesters of teaching the course over 10 years. The book requires minimum

background knowledge from the students, including only a three-semester of calculus, and a bit on matrices.The book covers many of the introductory topics for a first course in numerical computation, which fits in the short time frame of a semester course. Topics range from polynomial approximations and interpolation, to numerical methods for ODEs and PDEs. Emphasis was made more on algorithm development, basic mathematical ideas behind the algorithms, and the implementation in Matlab.The book is supplemented by two sets of videos, available through the author's YouTube channel. Homework problem sets are provided for each chapter, and complete answer sets are available for instructors upon request.The second edition contains a set of selected advanced topics, written in a self-contained manner, suitable for self-learning or as additional material for an honored version of the course. Videos are also available for these added topics.

A First Course in Statistical Programming with R World Scientific Praise for the First Edition ". . . outstandingly appealing with regard to

its style, contents, considerations of requirements of practice, choice of examples, and exercises." —Zentrablatt Math ". . . carefully structured with many detailed worked examples . . ." —The Mathematical Gazette ". . . an up-to-date and user-friendly account . . ." —Mathematika An Introduction to Numerical Methods and Analysis addresses the mathematics underlying approximation and scientific computing and successfully explains where approximation methods come from, why they sometimes work (or don't work), and when to use one of the many techniques that are available. Written in a style that emphasizes readability and usefulness for the numerical methods novice, the book begins with basic, elementary material and gradually builds up to more advanced topics. A selection of concepts required for the study of computational mathematics is introduced, and simple approximations using Taylor's Theorem are also treated in some depth. The text includes exercises that run the gamut from simple hand computations, to challenging derivations and minor proofs, to programming exercises. A greater emphasis on applied exercises as well as the cause and effect associated with numerical mathematics is featured throughout the book. An Introduction to Numerical

Methods and Analysis is the ideal text for students in advanced undergraduate mathematics and engineering courses who are interested in gaining an understanding of numerical methods and numerical analysis.

Numerical Methods of Statistics CRC Press

Linear Algebra: A First Course with Applications explores the fundamental ideas of linear algebra, including vector spaces, subspaces, basis, span, linear independence, linear transformation, eigenvalues, and eigenvectors, as well as a variety of applications, from inventories to graphics to Google ' s PageRank. Unlike other texts on the subject, this classroom-tested book gives students enough time to absorb the material by focusing on vector spaces early on and using computational sections as numerical interludes. It offers introductions to MapleTM, MATLAB ®, and TI-83 Plus for calculating matrix inverses, determinants, eigenvalues, and eigenvectors. Moving from the specific to the general, the author raises questions, provides motivation, and discusses strategy before presenting answers. Discussions of motivation and strategy include content and context to help students learn.

A First Course De Gruyter

This well-respected text gives an introduction to the theory and application of modern numerical approximation techniques for students taking a one- or two-semester course in numerical analysis. With an accessible treatment that only requires a calculus prerequisite, Burden and Faires explain how, why, and when approximation techniques can be expected to work, and why, in some situations, they fail. A wealth of examples and exercises develop students' intuition, and demonstrate the subject's practical applications to important everyday problems in math, computing, engineering, and physical science disciplines. The first book of its kind built from the ground up to serve a diverse undergraduate audience, three decades later Burden and Faires remains the definitive introduction to a vital and practical subject.

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A First Course in Continuum Mechanics Courier Corporation

Problem Solving is essential to solve real-world problems. Advanced Problem Solving with Maple: A First Course applies the mathematical modeling process by formulating, building, solving, analyzing, and criticizing mathematical models. It is intended for a

course introducing students to mathematical topics they will revisit within their further studies. The authors present mathematical modeling and problem-solving topics using Maple as the computer algebra system for mathematical explorations, as well as obtaining plots that help readers perform analyses. The book presents cogent applications that demonstrate an effective use of Maple, provide discussions of the results obtained using Maple, and stimulate thought and analysis of additional applications. Highlights: The book ' s real-world case studies prepare the student for modeling applications Bridges the study of topics and applications to various fields of mathematics, science, and engineering Features a flexible format and tiered approach offers courses for students at various levels The book can be used for students with only algebra or calculus behind them About the authors: Dr. William P. Fox is an emeritus professor in the Department of Defense Analysis at the Naval Postgraduate School. Currently, he is an adjunct professor, Department of Mathematics, the College of William and Mary. He received his Ph.D. at Clemson University and has many publications and scholarly activities including twenty books and over one hundred and fifty journal articles. William C. Bauldry, Prof. Emeritus and Adjunct Research Prof. of Mathematics at Appalachian State University, received his PhD in Approximation Theory from Ohio State. He has published many papers on pedagogy and technology, often using Maple, and has been the PI of several NSF-funded projects incorporating

technology and modeling into math courses. He currently serves as Associate Director of COMAP ' s Math Contest in Modeling (MCM).

A First Course in Computational Physics American Mathematical Soc.

Offers students a practical knowledge of modern techniques in scientific computing.

A First Course in Differential Equations with Modeling Applications Cambridge University Press

lead the reader to a theoretical understanding of the subject without neglecting its practical aspects. The outcome is a textbook that is mathematically honest and rigorous and provides its target audience with a wide range of skills in both ordinary and partial differential equations." --Book Jacket.

Theory and Experiments Springer Science & Business Media

A First Course in Stochastic Calculus is a complete guide for advanced undergraduate students to take the next step in exploring probability theory and for master's students in mathematical finance who would like to build an intuitive and theoretical understanding of stochastic processes. This book is also an essential tool for finance professionals who wish to sharpen their knowledge and intuition about stochastic calculus.

Louis-Pierre Arguin offers an exceptionally clear introduction to Brownian motion and to random processes governed by the principles of stochastic calculus. The beauty and power of the subject are made accessible to readers with a basic knowledge of probability, linear algebra, and multivariable calculus. This is achieved by emphasizing numerical experiments using elementary Python coding to build intuition and adhering to a rigorous geometric point of view on the space of random variables. This unique approach is used to elucidate the properties of Gaussian processes, martingales, and diffusions. One of the book's highlights is a detailed and self-contained account of stochastic calculus applications to option pricing in finance. Louis-Pierre Arguin's masterly introduction to stochastic calculus seduces the reader with its quietly conversational style; even rigorous proofs seem natural and easy. Full of insights and intuition, reinforced with many examples, numerical projects, and exercises, this book by a prize-winning mathematician and great teacher fully lives up to the author's reputation. I give it my strongest

possible recommendation. —Jim Gatheral, Baruch College I happen to be of a different persuasion, about how stochastic processes should be taught to undergraduate and MA students. But I have long been thinking to go against my own grain at some point and try to teach the subject at this level—together with its applications to finance—in one semester. Louis-Pierre Arguin's excellent and artfully designed text will give me the ideal vehicle to do so. —Ioannis Karatzas, Columbia University, New York

A First Course in Stochastic Calculus CRC Press

Provides an introduction to numerical methods for students in engineering. It uses Python 3, an easy-to-use, high-level programming language.

A First Course in Numerical Analysis American Mathematical Soc.

Elementary yet rigorous, this concise treatment is directed toward students with a knowledge of advanced calculus, basic numerical analysis, and some background in ordinary differential equations and linear algebra. 1968 edition.

MATLAB® Essentials Cambridge University Press

This textbook develops the fundamental skills of numerical analysis: designing numerical methods, implementing them in computer code, and analyzing their accuracy

and efficiency. A number of mathematical problems?interpolation, integration, linear systems, zero finding, and differential equations?are considered, and some of the most important methods for their solution are demonstrated and analyzed. Notable features of this book include the development of Chebyshev methods alongside more classical ones; a dual emphasis on theory and experimentation; the use of linear algebra to solve problems from analysis, which enables students to gain a greater appreciation for both subjects; and many examples and exercises. Numerical Analysis: Theory and Experiments is designed to be the primary text for a junior- or senior-level undergraduate course in numerical analysis for mathematics majors. Scientists and engineers interested in numerical methods, particularly those seeking an accessible introduction to Chebyshev methods, will also be interested in this book.

Numerical Analysis

Cengage Learning

This textbook is a concise introduction to the fundamental concepts and methods of numerical mathematics. The author manages to cover the many important topics while avoiding redundancies and using well-chosen examples and exercises. The exposition is supplemented by numerous figures. Work estimates and pseudo codes are provided for many algorithms, which can be easily converted

to computer programs. Topics covered include interpolation, the fast Fourier transform, iterative methods for solving systems of linear and nonlinear equations, numerical methods for solving ODEs, numerical methods for matrix eigenvalue problems, approximation theory, and computer arithmetic. The book is suitable as a text for a first course in numerical methods for mathematics students or students in neighboring fields, such as engineering, physics, and computer science. In general, the author assumes only a knowledge of calculus and linear algebra.

Numerical Methods Springer Science & Business Media

An elementary first course for students in mathematics and engineering Practical in approach: examples of code are provided for students to debug, and tasks – with full solutions – are provided at the end of each chapter Includes a glossary of useful terms, with each term supported by an example of the syntaxes commonly encountered

An Introduction to Programming and Numerical Methods in MATLAB Cambridge University Press

A First Course in Numerical

AnalysisCourier Corporation

A First Course in Atmospheric Numerical Modeling Cambridge University Press

A concise account of classic theories of fluids and solids, for graduate and advanced undergraduate courses in continuum mechanics.

Design, Analysis, and Computer Implementation of Algorithms Courier Dover Publications

Revised and updated, this second edition of Walter Gautschi's successful Numerical Analysis explores computational methods for problems arising in the areas of classical analysis, approximation theory, and ordinary differential equations, among others. Topics included in the book are presented with a view toward stressing basic principles and maintaining simplicity and teachability as far as possible, while subjects requiring a higher level of technicality are referenced in detailed bibliographic notes at the end of each chapter. Readers are thus given the guidance and opportunity to pursue advanced modern topics in more depth. Along with updated references, new biographical notes, and enhanced notational clarity, this second edition includes the

expansion of an already large collection of exercises and assignments, both the kind that deal with theoretical and practical aspects of the subject and those requiring machine computation and the use of mathematical software. Perhaps most notably, the edition also comes with a complete solutions manual, carefully developed and polished by the author, which will serve as an exceptionally valuable resource for instructors.