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Introduction to numerical analysis and scientific computing.

Boca Raton, FL: CRC Press (ISBN 978-1-4665-8948-3/hbk; 978-1-4665-8950-6/ebook). xix, 311 p. (2014).

The book under review is an introduction to basic topics of numerical analysis which can be covered in a one-semester course for students of mathematics, natural sciences or engineering. The topics covered include finding roots of nonlinear equations using the bisection method, Newton's method and the secant method; the Gaussian elimination method for solving linear systems; function interpolation and fitting; numerical differentiation and integration; and numerical methods for ordinary differential equations. The methods are introduced and their convergence and stability are discussed in some details. It also includes a chapter on computer number systems and floating point arithmetic. Computer codes written in MATLAB are also included. This book is suitable for undergraduate students and people who begin to learn about numerical analysis. Exercises and computer projects provided at the end of each chapter can help students to practise computational and programming skills. Table of contents: Chapter 1: Computer number systems and floating point arithmetic; Chapter 2: Finding roots of real single-valued functions; Chapter 3: Solving systems of linear equations by Gaussian elimination; Chapter 4: Polynomial interpolation and splines fitting; Chapter 5: Numerical differentiation and integration; Chapter 6: Advanced numerical integration; Chapter 7: Numerical solutions of ordinary differential equations (ODEs); Answers to odd-numbered exercises; Bibliography; Index. Reviewer's remark: The statement at the beginning of Chapter 7 "Differential equations involve the dependence of some variable $y(t)$ with respect to an independent time variable t" is misleading. Derivatives of $y(t)$ must be involved in the differential equations. Moreover, the independent variable t can be of other natures, it does not only have to represent the time. *Trung Thanh Nguyen (Charlotte)*

Classification: N15
Keywords: nonlinear equations; bisection method; Newton's method; secant method; Gaussian elimination method; interpolation; fitting; numerical differentiation and integration; convergence; stability