

MATH 328 Course Syllabus

Fall 2015

Text: *Burden, Faires, Burden, Numerical Analysis, 10th edition*, Cengage Learning ISBN: 978-1-305-25366-7

Section: Topic
1.1: Review of Calculus 1.2: Round-off Errors and Computer Arithmetic 1.3: Algorithms and Convergence
2.1: The Bisection Method 2.2: Fixed-Point Iteration 2.3: Newton's Method and Its Extensions 2.4: Error Analysis for Iterative Methods 2.6: Zeros of Polynomials and Müller's Method (Optional)
3.1: Interpolations and the Lagrange Polynomial 3.2: Data Approximation and Neville's Method 3.3: Divided Differences 3.4: Hermite Interpolation 3.5: Cubic Spline Interpolation
4.1: Numerical Differentiation 4.2: Richardson's Extrapolation 4.3: Elements of Numerical Integration 4.4: Composite Numerical Integration 4.5: Romberg Integration 4.6: Adaptive Quadrature Methods 4.7: Gaussian Quadrature 4.8: Multiple Integrals (Optional) 4.9: Improper Integrals (Optional)
5.1: The Elementary Theory of Initial-Value Problems 5.2: Euler's Method 5.3: Higher-Order Taylor Methods 5.4: Runge-Kutta Methods 5.9: Higher-Order Equations and Systems of Differential Equations (Optional) 5.5: Error Control and the Runge-Kutta-Fehlberg Method 5.6: Multistep Methods 5.7: Variable Step-Size Multistep Methods 5.10: Stability (Optional)
6.1: Linear Systems of Equations 6.2: Pivoting Strategies 6.3: Linear Algebra and Matrix Inversion 6.4: The Determinant of a Matrix 6.5: Matrix Factorization 6.6: Special Types of Matrices (Optional)