Mathematics of approximation

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Abstrak

The approximation of a continuous function by either an algebraic polynomial, a trigonometric polynomial, or a spline, is an important issue in application areas like computer-aided geometric design and signal analysis. This book is an introduction to the mathematical analysis of such approximation, and, with the prerequisites of only calculus and linear algebra. The topics include polynomial interpolation, Bernstein polynomials and the Weierstrass theorem, best approximations in the general setting of normed linear spaces and inner product spaces, best uniform polynomial approximation, orthogonal polynomials, Newton-Cotes , Gauss and Clenshaw-Curtis quadrature, the Euler-Maclaurin formula, approximation of periodic functions, the uniform convergence of Fourier series, spline approximation,with an extensive treatment of local spline interpolation,and its application in quadrature. Exercises are provided at the end of each chapter.