Spline functions are universally recognized as highly effective tools in approximation theory, computer-aided geometric design, image analysis, and numerical analysis. The theory of univariate splines is well known but this text is the first comprehensive treatment of the analogous multivariate theory.

A detailed mathematical treatment of polynomial splines on triangulations is presented, providing a basis for developing practical methods for using splines in numerous application areas. The treatment of the Bernstein–Bézier representation of polynomials will provide a valuable source for researchers and students in CAGD. Chapters on smooth macro-element spaces provide new tools to engineers and scientists for solving partial differential equations numerically. Workers in the geosciences will find the results on spherical splines on triangulations especially useful for approximation and data fitting on the sphere.

The book also includes a chapter on box splines, and four chapters on the latest research on trivariate splines.

This comprehensive book is ideal as a primary text for graduate courses in approximation theory, and as a source book for courses in computer-aided geometric design or in finite-element methods.

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