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Nota di contenuto	Preface; Contents; PART 1 Spline models; 1. Why spline functions?; 2. Interpolating splines of degree n; 3. Interpolating cubic splines; 3.1 Interpolating cubic splines with other extreme characteristics; 4. Smoothing natural cubic splines and the choice of the smoothing parameter; 4.1 Estimating the smoothing parameters; 5. Interpolating quadratic splines; 6. Interpolating quadratic splines and parabolas; 7. Smoothing quadratic splines; 7.1 Smoothing quadratic splines and the integral of the quadratic first derivative; 7.2 Quadratic splines smoothing the predefined first derivatives 8. Splines and averaged functions8.1 Averaged splines in the case of common knots; 8.2 Averaged kinetics and reference ranges; 8.3 Growth curves and averaged splines without common knots; PART 2 Compartment models; 9. Concept of a context related mathematical pharmacokinetical model; 10. Compartment models; 10.1 One-compartment model; 10.2 Two-compartment models; 10.3 More-compartment models; 11. Other deterministic models; 11.1 Compartment models with delay; 11.2 Nonlinear kinetics; 12. Calculability and identifiability; 13. Compartment models and associated residence time distributions

13.1 Unbounded residence times13.2 Properties of distributions of unbounded residence times; 13.3 Truncation; 14. Other stochastic models; 14.1 Stochastic differential equations; 14.2 Stochastic processes; 14.3 Regression attempts; 15. Calculation methods related to compartment models; 15.1 Method of least squares parameter calculations; 15.2 Statistical parameter estimation for an individual kinetics; 15.2.1 Varied minimum- X2-estimation; 15.2.2 Qualities of the varied minimum- X2-estimator; 15.3 The varied minimum- X2-method applied to population kinetics
16. Selection of pharmacokinetic models17. Pharmacokinetics for multiple applications; PART 3 Mathematica® programs for selected problems; Program list; Bibliography; Index

Sommario/riassunto

This book presents methods of mathematical modeling from two points of view. Splines provide a general approach while compartment models serve as examples for context related to modeling. The preconditions and characteristics of the developed mathematical models as well as the conditions surrounding data collection and model fit are taken into account. The substantial statements of this book are mathematically proven. The results are ready for application with examples and related program codes given. In this book, splines are algebraically developed such that the reader or user can easily und