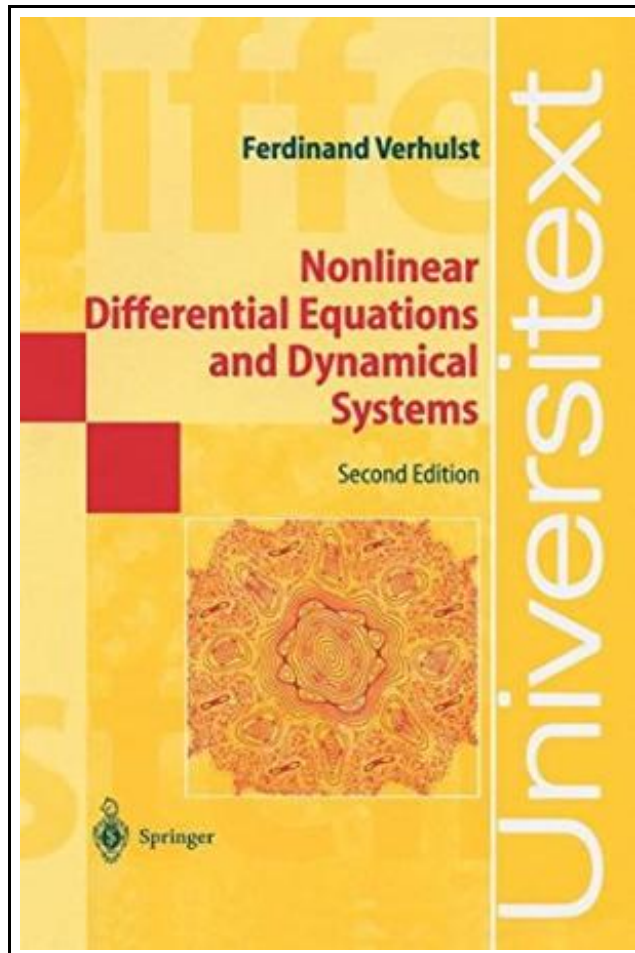


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NONLINEAR DIFFERENTIAL EQUATIONS AND DYNAMICAL SYSTEMS



Book Condition: New. Publisher/Verlag: Springer, Berlin | This book bridges the gap between elementary courses and the research literature. The basic concepts necessary to study differential equations - critical points and equilibrium, periodic solutions, invariant sets and invariant manifolds - are discussed. Stability theory is developed starting with linearisation methods going back to Lyapunov and Poincaré. The global direct method is then discussed. To obtain more quantitative information the Poincaré-Lindstedt method is introduced to approximate periodic solutions while at the same time proving existence by the implicit function theorem. The method of averaging is introduced as a general approximation-normalisation method. The last four chapters introduce the relaxation oscillations, bifurcation theory, centre manifolds, chaos in mappings and differential equations, Hamiltonian systems (recurrence, invariant tori, periodic solutions).

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