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Topological bifurcation theory is one of the most essential topics in mathematics. This book contains original bifurcation results for the existence of oscillations and chaotic behaviour of differential equations and discrete dynamical systems under variation of involved parameters. Using topological degree theory and a perturbation approach in dynamical systems, a broad variety of nonlinear problems are studied, including: non-smooth mechanical systems with dry frictions; weakly coupled oscillators; systems with relay hysteresis; differential equations on infinite lattices of Frenkel-Kontorova and discretized Klein-Gordon types; blue sky catastrophes for reversible dynamical systems; buckling of beams; and discontinuous wave equations.

Precise and complete proofs, together with concrete applications with many stimulating and illustrating examples, make this book valuable to both the applied sciences and mathematical fields, ensuring the book should not only be of interest to mathematicians but to physicists and theoretically inclined engineers interested in bifurcation theory and its applications to dynamical systems and nonlinear analysis.