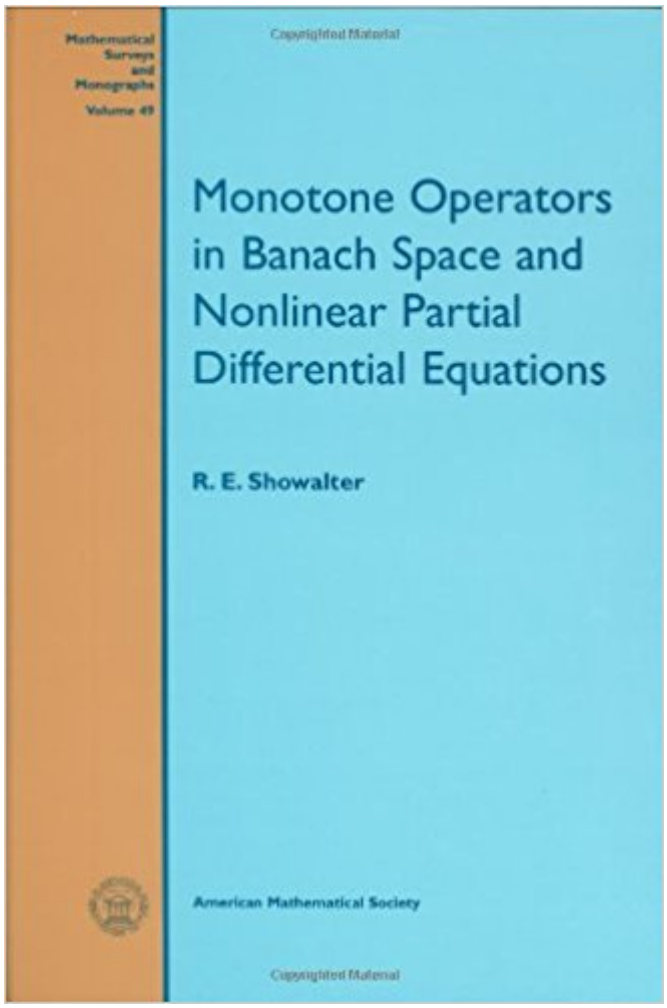
Monotone Operators In Banach Space And Nonlinear Partial Differential Equations (Mathematical Surveys And Monographs)



Synopsis

The objectives of this monograph are to present some topics from the theory of monotone operators and nonlinear semigroup theory which are directly applicable to the existence and uniqueness theory of initial-boundary-value problems for partial differential equations and to construct such operators as realizations of those problems in appropriate function spaces. A highlight of this presentation is the large number and variety of examples introduced to illustrate the connection between the theory of nonlinear operators and partial differential equations. These include primarily semilinear or quasilinear equations of elliptic or of parabolic type, degenerate cases with change of type, related systems and variational inequalities, and spatial boundary conditions of the usual Dirichlet, Neumann, Robin or dynamic type. The discussions of evolution equations include the usual initial-value problems as well as periodic or more general nonlocal constraints, history-value problems, those which may change type due to a possibly vanishing coefficient of the time derivative, and other implicit evolution equations or systems including hysteresis models. The scalar conservation law and semilinear wave equations are briefly mentioned, and hyperbolic systems arising from vibrations of elastic-plastic rods are developed. The origins of a representative sample of such problems is given in the Appendix.

Book Information

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Customer Reviews

The book is extremely clear and well written, and so it is very readable. It contains a large variety of examples and applications and consequently it will prove quite useful not only to mathematicians,

but also to engineers and physicists. --Mathematical ReviewsThe completeness and the way of presentation makes the text understandable to anybody who can be interested in existence and uniqueness theory for initial-boundary-value problems. --European Mathematical Society Newsletter --This text refers to the Paperback edition.

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