

BOOK REVIEWS

IOANNIS K. ARGYROS, *Polynomial Operator Equations in Abstract Spaces and Applications*, CRC Press, Boca Raton, Boston London New York Washington, 1998, 573 pp., ISBN 0-8493-8702-7.

An important class of operatorial equations, which has been intensively studied, is given by the polynomial operator equations. This class of equations appears from several problems of mathematical physics (Chandrasekhar equations concerning the radiative transfer, electron transport), integral equations of Hammerstein type, differential equations of Ricatti type, as well as eigenvalue/eigenvector problems.

Due to the particularities of these equations, the results concerning the study of the methods for approximating their solutions allow that under relative simple assumptions to obtain conclusions much richer than in the general case.

As we are aware, this book is a pioneering book, in which there are treated in a systematic way the polynomial operator equations.

Chapter 1 treats the algebraic theory of the polynomial equations of order two and are thoroughly analyzed some classes of such equations.

Chapter 2 is devoted to the study of the convergence and error evaluation for some numerical methods for solving such equations.

The following chapter deals with polynomial equations of degree n , $n \geq 2$. A separate paragraph is devoted to the study of polynomial equations in ordered Banach spaces.

In chapter 4 are studied some particular classes of polynomial equations: the Hammerstein equations, equations modelling the radiative transfer, differential polynomial equations, etc.

In chapter 5 there are studied the polynomial operators defined on linear spaces. An important part of this chapter is devoted to the study of the Lagrange and Hermite-type interpolation in Banach and Hermite spaces.

The convergence of some Newton-type methods, Halley-type methods, inexact Newton methods, etc, is studied in the next chapter.

The book contains many examples, most of them of numerical, which successfully illustrate the exposed theory.

In the end of the book the author gives 98 exercises and problems, both of theoretical and theoretical interest, which by careful analysis may lead to novel ideas and results. A large bibliography (210 titles) accompanies the material presented in the book.

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