Seminar on Fixed Point Theory Cluj-Napoca, **Volume 2, 2001, 101-102**
http://www.math.ubbcluj.ro/~nodeacj/journal.htm

BOOK REVIEWS

Ioan A. RUS: Generalized Contractions, Cluj University Press, 2001, 198 pp. (ISBN 973-8095-71-9)

The book is devoted to an important topic of nonlinear analysis, namely the fixed point theory for single-valued and multi-valued mappings.

It begins with an exposition of some well-known fixed point results, such as Banach contraction principle, Nemytzki-Edelstein theorem, Kannan theorem and Maia's theorem. A special attention is paid to the converses of Banach contraction principle, as well as, to the notions of Picard, Bessaga and Janos mappings.

Then a detalied study of the following types of generalized contractions: $\varphi-$contractions, generalized $\varphi-$contractions, (δ, φ)-contractions, (α, φ)-contractions is presented. Stability results for the fixed points set, fixed point theorems for multivalued operators and the abstract theory of fixed point structures are also investigated. Several open questions of the metric fixed point theory are pointed out in each chapter. Finally, some applications of the above mentioned results to integral equations from applied mathematics are considered. An important reference list conclude the book.

This monograph, which is undoubtedly a HANDBOOK OF THE METRIC FIXED POINT THEORY, will be of value to advanced graduate students in mathematics and researchers in fixed point theory, differential and integral equations, multivalued analysis and related fields.

Adrian Petruşel

Adriana BUICA, Coincidence Principles and Applications (in Romanian), Presa Universitară Clujeană (Cluj University Press), Cluj-Napoca, 2001, pp 183. (ISBN 973-8095-96-4)

The coincidence problems can be presented as abstract equations of the form $L(u) = N(u)$, where L and N are operators acting between two spaces X and Y. The solutions of such an equation are called coincidence points of L and N. Many problems from theory and practice yield to coincidence equations. So are all the fixed point problems, $u = N(u)$, when $L(u) = u$, and all problems of finding zeros, $0 = N(u)$, where $L(u) = 0$. There are cases where a problem arising from the theory of differential equations or partial differential equations, can be formulated most naturally as a coincidence equation and not as a fixed point problem. So are the periodic solutions problems.

The aim of this book is to present some of the major methods which are used in the treatment of coincidence problems. Thus, the author deals with the coincidence theorem of Goebel, the monotone iterative principle of Carl-Heikkila, the Holsztynski's theory of universal operators, the Furi-Martelli-Vignoli theory of zero-epi mappings and with the more recent idea of nearness of operators due to Campanato.

The book also contains many new results, some of them here presented for the first time.

The contents are as follows: Chapter 1: Fundamental principles of coincidence; Chapter 2: Coincidence theorems in ordered spaces and applications; Chapter 3: Universal Operators. Zero-epi operators; Chapter 4: The coincidence degree. Applications; Chapter 5: Weakly near operators.

The Bibliography contains 195 titles and represents a good guide in the recent literature in this domain.

The book addresses to graduate students and to young mathematicians interested by nonlinear analysis, integral, differential and partial differential equations and inequalities.

Radu Precup

Donal O'REGAN and Radu PRECUP, Theorems of Leray-Schauder Type and Applications, Gordon and Breach Science Publishers, 2001, x+206 pp. (ISBN: 90-5699-295-3)

The aim of this book is to present the basic theory of continuation principles for several classes of nonlinear operators (such as: contraction mappings, nonexpansive mappings, accreative operators, completely continuous maps, monotone operators), as well as, some applications to differential equations and partial differential equations.

The content of the book is as follows:

1. Overview 2. Theorems of Leray-Schauder Type for Contractions 3. Continuation Theorems for Nonexpansive Maps 4. Theorems of Leray-Schauder Type for Accreative Maps 5. Continuation Theorems Involving Compactness 6. Applications to Semilinear Elliptic Problems 7. Theorems of Leray-Schauder Type for Coincidences 8. Theorems of Selective Continuation 9. The Unified Theory 10. Multiplicity 11. Local Continuation Theorems .

The book contains not only authors'own contributions, but also several new results together with some of their applications. The text is self-contained and it is an excellent introduction into the topological methods of nonlinear analysis. The bibliography includes 161 titles.

The monograph is an important contribution to the theory of continuation methods of Leray-Schauder type and it will be of great interest for advanced graduate students in mathematics and researchers interested in nonlinear analysis, ordinary differential equations, integral equations and partial differential equations.

Adrian Petruşel