This book is an introduction to nonlinear analysis striving to keep a balance between theory and its numerous applications with an emphasis towards optimization and partial differential equations. After a quick overview of the basics of linear functional analysis it proceeds to a systematic presentation of fundamental concepts and techniques of nonlinear analysis and in particular those related to variational problems. It covers a wide variety of topics such as fixed point theory, convexity, smooth and nonsmooth analysis, minimax theorems and duality, calculus of variations, variational inequalities, critical point theory and monotone operators.

The book, which is of interest to graduate students, lecturers and researchers, places an emphasis on a pedagogical and modern presentation of nonlinear analysis at the graduate level, and intends in familiarizing the reader with the essential knowledge required to understand, apply and advance further this useful and modern area of mathematics. With numerous fully worked examples and detailed treatment of all theoretical results, it is suitable for independent study or for planning a graduate course.

- A pedagogical presentation of nonlinear analysis at the graduate level
- Puts a focus on variational techniques and their numerous applications
- Of interest to graduate students, lecturers, and researchers

Dimitrios C. Kravvaritis
is Professor Emeritus at the School of Mathematics and Physical Sciences of the National Technical University of Athens. His research interests include nonlinear analysis, partial differential equations and their applications.

Athanasios N. Yannacopoulos
is Professor at the Department of Statistics of Athens University of Economics and Business. His research interests include nonlinear and stochastic analysis and its applications in modern technologies and economics.

www.degruyter.com
ISBN 978-3-11-064736-5