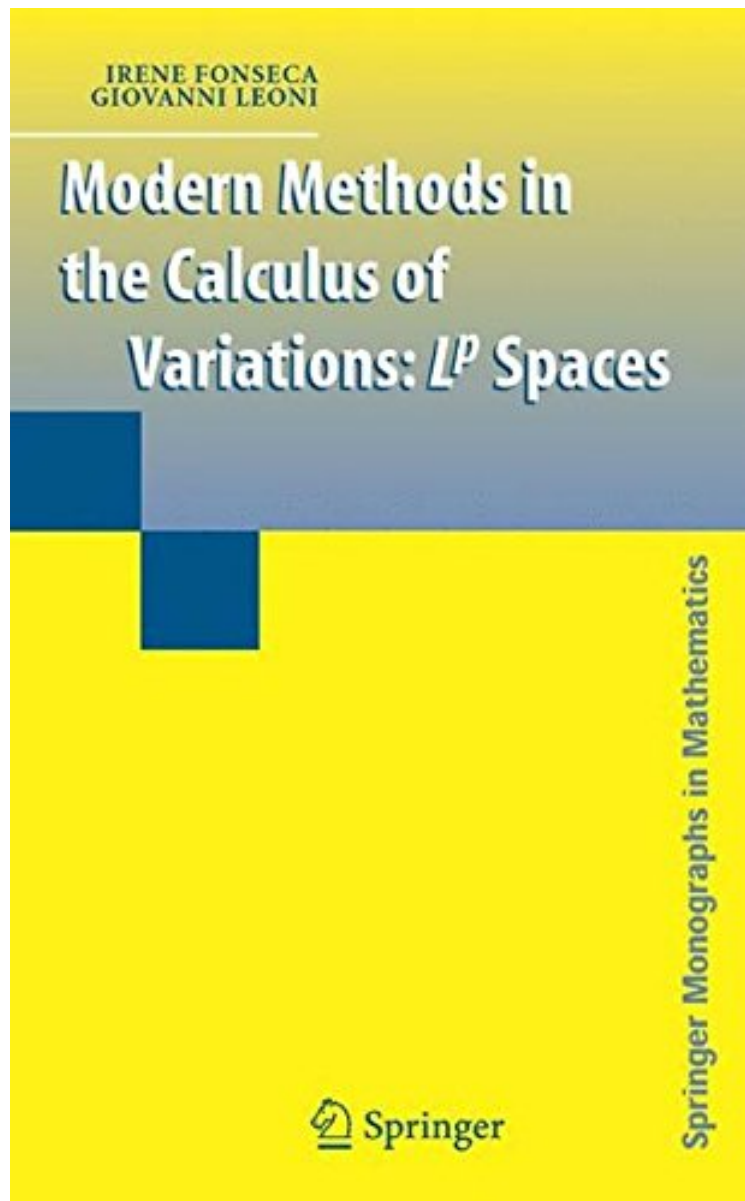


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Modern Methods in the Calculus of Variations: L^p Spaces (Springer Monographs in Mathematics)

Irene Fonseca, Giovanni Leoni

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From the reviews: "This book is intended as a graduate textbook and reference for those who work in the modern calculus of variations. interesting examples and exercises help to keep the reader on track. Several open problems are indicated as well. excellent presentation." (Erik J. Balder, Mathematical s, Issue 2008 m) "This book is the first of two volumes in the calculus of variations and measure theory. The main objective of this book is to introduce necessary and sufficient conditions for sequential lower semicontinuity of functionals on L^p -spaces. This book is very nicely written, self-contained and it is an excellent and modern introduction to the calculus of variations." (Jean-Pierre Raymond, Zentrablatt MATH, Vol. 1153, 2009) This is the first of a two-volume introduction into direct methods in the calculus of variations. Its main topic is the analysis of necessary and sufficient conditions for lower semicontinuity on L^p -spaces, as well as of relaxation techniques. The book provides a well-written and self-contained introduction to an active area of research and will be valuable both to graduate students as an introduction and to researchers in the field as a reference work. (M. Kunzinger, Monatshefte fr Mathematik, Vol. 156 (4), April, 2009) From the Back Cover This is the first of two books on methods and techniques in the calculus of variations. Contemporary arguments are used throughout the text to streamline and present in a unified way classical results, and to provide novel contributions at the forefront of the theory. This book addresses fundamental questions related to lower semicontinuity and relaxation of functionals within the unconstrained setting, mainly in L^p spaces. It prepares the ground for the second volume where the variational treatment of functionals involving fields and their derivatives will be undertaken within the framework of Sobolev spaces. This book is self-contained. All the statements are fully justified and proved, with the exception of basic results in measure theory, which may be found in any good textbook on the subject. It also contains several exercises. Therefore, it may be used both as a graduate textbook as well as a reference text for researchers in the field. Irene Fonseca is the Mellon College of Science Professor of Mathematics and is currently the Director of the Center for Nonlinear Analysis in the Department of Mathematical Sciences at Carnegie Mellon University. Her research interests lie in the areas of continuum mechanics, calculus of variations, geometric measure theory and partial differential equations. Giovanni Leoni is also a professor in the Department of Mathematical Sciences at Carnegie Mellon University. He focuses his research on calculus of variations, partial differential equations and geometric measure theory with special emphasis on applications to problems in continuum mechanics and in materials science.