



## A First Course in the Calculus of Variations (Student Mathematical Library)

By Mark Kot



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This book is intended for a first course in the calculus of variations, at the senior or beginning graduate level. The reader will learn methods for finding functions that maximize or minimize integrals. The text lays out important necessary and sufficient conditions for extrema in historical order, and it illustrates these conditions with numerous worked-out examples from mechanics, optics, geometry, and other fields. The exposition starts with simple integrals containing a single independent variable, a single dependent variable, and a single derivative, subject to weak variations, but steadily moves on to more advanced topics, including multivariate problems, constrained extrema, homogeneous problems, problems with variable endpoints, broken extremals, strong variations, and sufficiency conditions. Numerous line drawings clarify the mathematics. Each chapter ends with recommended readings that introduce the student to the relevant scientific literature and with exercises that consolidate understanding.

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### Editorial Review

#### Review

This text follows the historical development of the subject and offers the reader a mixture of theory, techniques and applications. ...The author integrates theory and applications quite deftly with the historical background and gives us a very attractive book. ...The introductory chapter gives a good indication of what's to come: clear writing, a carefully laid out development, well-chosen line drawings, and a thoughtful selection of recommended reading. ...This would serve admirably as the text for a course or as a tool for self-study. The exercises are first rate... --MAA Reviews

Kot displays more than a pedagogical sensitivity to notation (a traditional pitfall!); he inculcates the appreciation of notational nuance in his readers. Everyone who wants to learn this subject should start by investing the few hours necessary to read this book. --Choice

#### About the Author

Mark Kot , University of Washington, Seattle, WA, USA.

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