

Sundaram, Rangarajan K.

A first course in optimization theory. (English) Zbl 0885.90106
Cambridge: Cambridge University Press. xvi, 357 p. (1996).

The book gives a well-written introduction to continuous optimization. For each result numerous examples are given to explain the central ideas and limitations of the result. In addition, many applications from economics are discussed. The presentation is kept at a simple level; it avoids a detailed discussion of some of the ideas, and concentrates on issues that are relevant for applications. In the text for example, “the” constraint qualification is simply the linear independence of the gradients of the active (effective) constraints, and no comment is made that there are other forms of constraint qualification. In spite of the simplicity, the book contains a rather detailed collection of all relevant results for continuous optimization. Summarizing, the book is an excellent reference for self-studies, especially for students in business and economics.

The contents of the book is organized as follows. The notation and basic concepts from analysis and linear algebra are introduced in Chapter 1. Chapters 2 and 3 present a general discussion, Chapters 4, 5, and 6 deal with unconstrained, equality constrained, and inequality constrained optimization, and discuss first- and second-order conditions for optimality. In Chapters 7 and 8, additional results for convex and quasi-convex problems are discussed. Chapter 9 develops a theory about the dependence of the solution of an optimization problem on a set of parameters who define the problem. Chapters 10, 11, and 12, finally discuss supermodularity, finite-horizon dynamic programming and stationary discounted dynamic programming. The appendix covers basic concepts from set theory and logic, the real numbers, and vector spaces.

Reviewer: [H.Noltemeier \(Würzburg\)](#)

MSC:

- 90C30** Nonlinear programming
- 90C39** Dynamic programming
- 90-01** Introductory exposition (textbooks, tutorial papers, etc.) pertaining to operations research and mathematical programming

Cited in **58** Documents

Keywords:

[Optimization](#); [constrained](#); [unconstrained](#); [convex](#); [quasi-convex](#); [parametric](#); [dynamic programming](#); [continuous optimization](#)

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