1. Record Nr. UNINA9910162993403321

Autore	Arutyunov Aram V.
Titolo	Convex and Set-Valued Analysis : Selected Topics / / Aram V. Arutyunov, Valeri Obukhovskii
Pubbl/distr/stampa	Berlin ; ; Boston : , : De Gruyter, , [2016] ©2017
ISBN	3-11-046041-6 3-11-046030-0
Descrizione fisica	1 online resource (210 pages)
Collana	De Gruyter Textbook
Disciplina	515.882
Soggetti	Convex sets Hausdorff measures Topological spaces Differential inclusions Set-valued maps
Lingua di pubblicazione	Inglese
Formato	Materiale a stampa
Livello bibliografico	Monografia
Nota di bibliografia	Includes bibliographical references and index.
Nota di contenuto	Frontmatter -- Preface -- Contents -- Part I: Convex analysis -- 1. Convex sets and their properties -- 2. The convex hull of a set. The interior of convex sets -- 3. The affine hull of sets. The relative interior of convex sets -- 4. Separation theorems for convex sets -- 5. Convex functions -- 6. Closedness, boundedness, continuity, and Lipschitz property of convex functions -- 7. Conjugate functions -- 8. Support functions -- 9. Differentiability of convex functions and the subdifferential -- 10. Convex cones -- 11. A little more about convex cones in infinite-dimensional spaces -- 12. A problem of linear programming -- 13. More about convex sets and convex hulls -- Part II: Set-valued analysis -- 14. Introduction to the theory of topological and metric spaces -- 15. The Hausdorff metric and the distance between sets -- 16. Some fine properties of the Hausdorff metric -- 17. Set-valued maps. Upper semicontinuous and lower semicontinuous set-valued maps -- 18. A base of topology of the space Hc(X) -- 19. Measurable set-valued maps. Measurable selections and measurable choice theorems -- 20. The superposition set-valued operator -- 21.

The Michael theorem and continuous selections. Lipschitz selections. Single-valued approximations -- 22. Special selections of set-valued maps -- 23. Differential inclusions -- 24. Fixed points and coincidences of maps in metric spaces -- 25. Stability of coincidence points and properties of covering maps -- 26. Topological degree and fixed points of set-valued maps in Banach spaces -- 27. Existence results for differential inclusions via the fixed point method -- Notation -- Bibliography -- Index

Sommario/riassunto

This textbook is devoted to a compressed and self-contained exposition of two important parts of contemporary mathematics: convex and set-valued analysis. In the first part, properties of convex sets, the theory of separation, convex functions and their differentiability, properties of convex cones in finite- and infinite-dimensional spaces are discussed. The second part covers some important parts of set-valued analysis. There the properties of the Hausdorff metric and various continuity concepts of set-valued maps are considered. The great attention is paid also to measurable set-valued functions, continuous, Lipschitz and some special types of selections, fixed point and coincidence theorems, covering set-valued maps, topological degree theory and differential inclusions. Contents: PrefacePart I: Convex analysisConvex sets and their propertiesThe convex hull of a set. The interior of convex setsThe affine hull of sets. The relative interior of convex setsSeparation theorems for convex setsConvex functionsClosedness, boundedness, continuity, and Lipschitz property of convex functionsConjugate functionsSupport functionsDifferentiability of convex functions and the subdifferentialConvex conesA little more about convex cones in infinite-dimensional spacesA problem of linear programmingMore about convex sets and convex hullsPart II: Set-valued analysisIntroduction to the theory of topological and metric spacesThe Hausdorff metric and the distance between setsSome fine properties of the Hausdorff metricSet-valued maps. Upper semicontinuous and lower semicontinuous set-valued mapsA base of topology of the spaceHc(X) Measurable set-valued maps. Measurable selections and measurable choice theoremsThe superposition set-valued operatorThe Michael theorem and continuous selections. Lipschitz selections. Single-valued approximationsSpecial selections of set-valued mapsDifferential inclusionsFixed points and coincidences of maps in metric spacesStability of coincidence points and properties of covering mapsTopological degree and fixed points of set-valued maps in Banach spacesExistence results for differential inclusions via the fixed point methodNotationBibliographyIndex