

1. Record Nr.	UNINA9910830147503321
Autore	Akcoglu Mustafa A (Mustafa Agah), <1934->
Titolo	Analysis in vector spaces [[electronic resource]] : a course in advanced calculus // Mustafa A. Akcoglu, Paul F.A. Bartha, Dzung M. Ha
Pubbl/distr/stampa	Hoboken, N.J., : Wiley-Interscience, c2009
ISBN	1-283-27395-0 9786613273956 1-118-16458-X 1-118-16459-8
Descrizione fisica	1 online resource (480 p.)
Altri autori (Persone)	BarthaPaul F. A. <1964-> HaDzung Minh
Disciplina	512.52 512/.52
Soggetti	Vector spaces Functional analysis
Lingua di pubblicazione	Inglese
Formato	Materiale a stampa
Livello bibliografico	Monografia
Note generali	Includes index.
Nota di contenuto	Analysis in Vector Spaces: A Course in Advanced Calculus; CONTENTS; Preface; PART I BACKGROUND MATERIAL; 1 Sets and Functions; 1.1 Sets in General; 1.2 Sets of Numbers; 1.3 Functions; 2 Real Numbers; 2.1 Review of the Order Relations; 2.2 Completeness of Real Numbers; 2.3 Sequences of Real Numbers; 2.4 Subsequences; 2.5 Series of Real Numbers; 2.6 Intervals and Connected Sets; 3 Vector Functions; 3.1 Vector Spaces: The Basics; 3.2 Bilinear Functions; 3.3 Multilinear Functions; 3.4 Inner Products; 3.5 Orthogonal Projections; 3.6 Spectral Theorem; PART II DIFFERENTIATION; 4 Normed Vector Spaces 4.1 Preliminaries4.2 Convergence in Normed Spaces; 4.3 Norms of Linear and Multilinear Transformations; 4.4 Continuity in Normed Spaces; 4.5 Topology of Normed Spaces; 5 Derivatives; 5.1 Functions of a Real Variable; 5.2 Differentiable Functions; 5.3 Existence of Derivatives; 5.4 Partial Derivatives; 5.5 Rules of Differentiation; 5.6 Differentiation of Products; 6 Diffeomorphisms and Manifolds; 6.1 The Inverse Function Theorem; 6.2 Graphs; 6.3 Manifolds in Parametric Representations; 6.4 Manifolds in Implicit Representations; 6.5

Differentiation on Manifolds; 7 Higher-Order Derivatives

7.1 Definitions; 7.2 Change of Order in Differentiation; 7.3 Sequences of Polynomials; 7.4 Local Extremal Values; PART III INTEGRATION; 8 Multiple Integrals; 8.1 Jordan Sets and Volume; 8.2 Integrals; 8.3 Images of Jordan Sets; 8.4 Change of Variables; 9 Integration on Manifolds; 9.1 Euclidean Volumes; 9.2 Integration on Manifolds; 9.3 Oriented Manifolds; 9.4 Integrals of Vector Fields; 9.5 Integrals of Tensor Fields; 9.6 Integration on Graphs; 10 Stokes' Theorem; 10.1 Basic Stokes' Theorem; 10.2 Flows; 10.3 Flux and Change of Volume in a Flow; 10.4 Exterior Derivatives

10.5 Regular and Almost Regular Sets; 10.6 Stokes' theorem on Manifolds; PART IV APPENDICES; Appendix A: Construction of the real numbers; A.1 Field and Order Axioms in \mathbb{Q} ; A.2 Equivalence Classes of Cauchy Sequences in \mathbb{Q} ; A.3 Completeness of \mathbb{R} ; Appendix B: Dimension of a vector space; B.1 Bases and linearly independent subsets; Appendix C: Determinants; C.1 Permutations; C.2 Determinants of Square Matrices; C.3 Determinant Functions; C.4 Determinant of a Linear Transformation; C.5 Determinants on Cartesian Products; C.6 Determinants in Euclidean Spaces; C.7 Trace of an Operator; Appendix D: Partitions of unity; D.1 Partitions of Unity; Index

Sommario/riassunto

A rigorous introduction to calculus in vector spaces. The concepts and theorems of advanced calculus combined with related computational methods are essential to understanding nearly all areas of quantitative science. Analysis in Vector Spaces presents the central results of this classic subject through rigorous arguments, discussions, and examples. The book aims to cultivate not only knowledge of the major theoretical results, but also the geometric intuition needed for both mathematical problem-solving and modeling in the formal sciences. The authors begin with an outline of
