1. Record Nr. UNINA9910300141103321

Autore	Lerner Nicolas
Titolo	A Course on Integration Theory : including more than 150 exercises with detailed answers / / by Nicolas Lerner
Pubbl/distr/stampa	Basel : , : Springer Basel : , : Imprint : Birkhäuser, , 2014
ISBN	3-0348-0694-9
Edizione	[1st ed. 2014.]
Descrizione fisica	1 online resource (XVIII, 492 p. 15 illus., 3 illus. in color.) : online resource
Disciplina	515.8 515.42
Soggetti	Functions of real variables Measure theory Real Functions Measure and Integration
Lingua di pubblicazione	Inglese
Formato	Materiale a stampa
Livello bibliografico	Monografia
Note generali	Bibliographic Level Mode of Issuance: Monograph
Nota di bibliografia	Includes bibliographical references and index.
Nota di contenuto	1 Introduction -- 2 General theory of integration -- 3 Construction of the Lebesgue measure on R^d -- 4 Spaces of integrable functions -- 5 Integration on a product space -- 6 Diffeomorphisms of open subsets of R^d and integration -- 7 Convolution -- 8 Complex measures -- 9 Harmonic analysis -- 10 Classical inequalities.
Sommario/riassunto	This textbook provides a detailed treatment of abstract integration theory, construction of the Lebesgue measure via the Riesz-Markov Theorem and also via the Carathéodory Theorem. It also includes some elementary properties of Hausdorff measures as well as the basic properties of spaces of integrable functions and standard theorems on integrals depending on a parameter. Integration on a product space, change-of-variables formulas as well as the construction and study of classical Cantor sets are treated in detail. Classical convolution inequalities, such as Young's inequality and Hardy-Littlewood-Sobolev inequality, are proven. Further topics include the Radon-Nikodym theorem, notions of harmonic analysis, classical inequalities and interpolation theorems including Marcinkiewicz's theorem, and the definition of Lebesgue points and the Lebesgue differentiation

theorem. Each chapter ends with a large number of exercises and detailed solutions. A comprehensive appendix provides the reader with various elements of elementary mathematics, such as a discussion around the calculation of antiderivatives or the Gamma function. It also provides more advanced material such as some basic properties of cardinals and ordinals which are useful for the study of measurability.