

1. Record Nr.	UNINA9910141052703321
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Titolo	Fourier analysis [[electronic resource] /] / Eric Stade
Pubbl/distr/stampa	Hoboken, N.J., : Wiley, c2005
ISBN	1-283-29486-9 9786613294869 1-118-16550-0 1-118-16551-9
Descrizione fisica	1 online resource (519 p.)
Collana	Pure and applied mathematics
Disciplina	515.2433 515/.2433
Soggetti	Fourier analysis Mathematical analysis
Lingua di pubblicazione	Inglese
Formato	Materiale a stampa
Livello bibliografico	Monografia
Note generali	Description based upon print version of record.
Nota di bibliografia	Includes bibliographical references and index.
Nota di contenuto	Fourier Analysis; Contents; Preface; Introduction; 1 Fourier Coefficients and Fourier Series; 1.1 Periodic Functions: Beginning Bits; 1.2 Fourier Coefficients of 2-Periodic Functions; 1.3 More on $P = 2$; 1.4 Pointwise Convergence of Fourier Series: A Theorem; 1.5 An Application: Evaluation of Infinite Series; 1.6 Gibbs' Phenomenon; 1.7 Uniform Convergence of Fourier Series: A Theorem; 1.8 Derivatives, Antiderivatives, and Fourier Series; 1.9 Functions of Other Periods $P > 0$; 1.10 Amplitude, Phase, and Spectra; 1.11 Functions on Bounded Intervals: Standard Fourier Series 1.12 Other Fourier Series for Functions on Bounded Intervals 2 Fourier Series and Boundary Value Problems; 2.1 Steady State Temperatures and "the Fourier Method"; 2.2 Linear Operators, Homogeneous Equations, and Superposition; 2.3 Heat Flow in a Bar I: Neumann and Mixed Boundary Conditions; 2.4 Heat Flow in a Bar II: Other Boundary Conditions; 2.5 Cylindrical and Polar Coordinates; 2.6 Spherical Coordinates; 2.7 The Wave Equation I; 2.8 The Wave Equation II: Existence and Uniqueness of Solutions; 2.9 The Wave Equation III: Fourier Versus d'Alembert 2.10 The Wave Equation IV: Temporally Constant Inhomogeneity 2.11

The Wave Equation V: Temporally Varying Inhomogeneity; 2.12 The Wave Equation VI: Drumming Up Some Interest; 2.13 Triple Fourier Series; 3 L2 Spaces: Optimal Contexts for Fourier Series; 3.1 The Mean Square Norm and the Inner Product on $C(T)$; 3.2 The Vector Space $L2(T)$; 3.3 More on $L2(T)$; the Vector Space $L1(T)$; 3.4 Norm Convergence of Fourier Series: A Theorem; 3.5 More on Integration; 3.6 Orthogonality, Orthonormality, and Fourier Series; 3.7 More on the Inner Product; 3.8 Orthonormal Bases for Product Domains
3.9 An Application: The Isoperimetric Problem
3.10 What Is $L2(T)$?; 4 Sturm-Liouville Problems; 4.1 Definitions and Basic Properties; 4.2 Some Boundary Value Problems; 4.3 Bessel Functions I: Bessel's Equation of Order n ; 4.4 Bessel Functions II: Fourier-Bessel Series; 4.5 Bessel Functions III: Boundary Value Problems; 4.6 Orthogonal Polynomials; 4.7 More on Legendre Polynomials; 5 Convolution and the Delta Function: A Splat and a Spike; 5.1 Convolution: What Is It?; 5.2 Convolution: When Is It Compactly Supported?; 5.3 Convolution: When Is It Bounded and Continuous?
5.4 Convolution: When Is It Differentiable?
5.5 Convolution: An Example; 5.6 Convolution: When Is It In $L1(R)$? In $L2(R)$?; 5.7 Approximate Identities and the Dirac Delta "Function"; 6 Fourier Transforms and Fourier Integrals; 6.1 The Fourier Transform on $L1(R)$: Basics; 6.2 More on the Fourier Transform on $L1(R)$; 6.3 Low-Impact Fourier Transforms (Integration by Differentiation); 6.4 Fourier Inversion on $FL1(R)$; 6.5 The Fourier Transform and Fourier Inversion on $L2(R)$; 6.6 Fourier Inversion of Piecewise Smooth, Integrable Functions; 6.7 Fourier Cosine and Sine Transforms
6.8 Multivariable Fourier Transforms and Inversion

Sommario/riassunto

A reader-friendly, systematic introduction to Fourier analysis. Rich in both theory and application, Fourier Analysis presents a unique and thorough approach to a key topic in advanced calculus. This pioneering resource tells the full story of Fourier analysis, including its history and its impact on the development of modern mathematical analysis, and also discusses essential concepts and today's applications. Written at a rigorous level, yet in an engaging style that does not dilute the material, Fourier Analysis brings two profound aspects of the discipline to the fo

2. Record Nr.	UNIORUON00382644
Autore	CORSI, Mario
Titolo	A traverso il Gebel / Mario Corsi
Pubbl/distr/stampa	160 p., : ill. ; 21 cm
Edizione	[Roma : C. A. Bontempelli]
Descrizione fisica	Esemplare in fotocopia
Disciplina	916.1204
Soggetti	LIBIA - Descrizioni e viaggi
Lingua di pubblicazione	Italiano
Formato	Materiale a stampa
Livello bibliografico	Monografia