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Descrizione fisica	1 online resource (954 p.)
Collana	Advanced series on ocean engineering ; ; v. 21
Disciplina	624.1/72
Soggetti	Fluid dynamics - Mathematical models Ocean waves - Mathematical models Water waves - Mathematical models Electronic books.
Lingua di pubblicazione	Inglese
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Note generali	Description based upon print version of record.
Nota di bibliografia	Includes bibliographical references and index.
Nota di contenuto	Contents ; Preface ; 1 Introduction ; 2 Mathematical Preliminaries ; 2.1 Introduction ; 2.2 Symbols Functions and Linear Operators ; 2.2.1 Landau Order Symbols $O(E)$ and $o(E)$ (Nayfeh 1973 Chapter 1.3 and Olver 1990 Chapter 12.1.1) ; 2.2.2 Heaviside Step Function $U(x-E)$ 2.2.3 Kronecker Delta δ_{mn} Function and Dirac Delta $\delta(x-E)$ Distribution 2.2.4 Levi-Civita Symbol ϵ_{ijk} (Arfken 1985) ; 2.2.5 Gamma Functions $\Gamma(o)$ (Andrews 1985) ; 2.2.6 Error Functions $\text{Erf}(o)$ and $\text{Erfc}(o)$ (Barcilon 1990 p. 351) ; 2.2.7 Gradient Vector Operator $\nabla(o)$ 2.2.8 Curl Vector Operator $w = \nabla \times (o)$ 2.2.9 Laplacian Operator $\nabla^2(o) = A(o)$; 2.2.10 Stokes Material Derivative Operator $D(o)/Dt$; 2.2.11 Leibnitz's Rule for Differentiation of Integrals with Parameters (Hildebrand 1976 Chapter 7.9) ; 2.2.12 Signum (sign +) Function

2.3 Properties of Series (Hildebrand 1976 Chapter 4.1)	2.3.1 Power Series
2.3.2 Function Series	; 2.3.3 Maclaurin and Taylor Series (Hildebrand 1976 Chapters 4.1 and 7.5)
	; 2.3.4 Binomial Expansion (Wylie and Barrett 1982 p.938)
2.4 Elementary and Special Functions (Hildebrand 1976 Chapter 10.2)	
2.4.1 Trigonometric and Hyperbolic Identities	
	; 2.4.2 Euler's Constant γ (Barclon 1990 p. 346)
	; 2.4.3 Bessel Functions (Hildebrand 1976 Chapters 4.8 to 4.10)
	; 2.4.4 Orthogonal Polynomials
2.5 Linear Ordinary Differential Equations (Hildebrand 1976 Chapters 1.1 to 1.11) and Operational Calculus (Friedman 1956)	

Sommario/riassunto

This book focuses on: (1) the physics of the fundamental dynamics of fluids and of semi-immersed Lagrangian solid bodies that are responding to wave-induced loads; (2) the scaling of dimensional equations and boundary value problems in order to determine a small dimensionless parameter that may be applied to linearize the equations and the boundary value problems so as to obtain a linear system; (3) the replacement of differential and integral calculus with algebraic equations that require only algebraic substitutions instead of differentiations and integrations; and (4) the importance of c