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Numerical Modelling of Wave Energy Converters - Matt Folley
2016-06-14

Numerical Modelling of Wave Energy Converters: State-of-the Art Techniques for Single WEC and Converter Arrays presents all the information and techniques required for the numerical modelling of a wave energy converter together with a comparative review of the different available techniques. The authors provide clear details on the subject and guidance on its use for WEC design, covering topics such as boundary element methods, frequency domain models, spectral domain models, time domain models, non linear potential flow models, CFD models, semi analytical models, phase resolving wave propagation models, phase averaging wave propagation models, parametric design and control optimization, mean annual energy yield, hydrodynamic loads assessment, and environmental impact assessment. Each chapter starts by defining the fundamental principles underlying the numerical modelling technique and finishes with a discussion of the technique's limitations and a summary of the main points in the chapter. The contents of the chapters are not limited to a description of the mathematics, but also include details and discussion of the current available tools, examples available in the literature, and verification, validation, and computational requirements. In this way, the key points of each modelling technique can be identified without having to get deeply involved in the mathematical representation that is at the core of each chapter. The book is separated into four parts. The first two parts deal with modelling single wave energy converters; the third part considers the modelling of arrays; and the final part looks at the application of the different modelling techniques to the four most common uses of numerical models. It is ideal for graduate engineers and scientists interested in numerical modelling of wave energy converters, and decision-makers who must review different modelling techniques and assess their suitability and output. Consolidates in one volume information and techniques for the numerical modelling of wave energy converters and converter arrays, which has, up until now, been spread around multiple academic journals and conference proceedings making it difficult to access Presents a comparative review of the different numerical modelling techniques applied to wave energy converters, discussing their limitations, current available tools, examples, and verification, validation, and computational requirements Includes practical examples and simulations available for download at the book's companion website Identifies key points of each modelling technique without getting deeply involved in the mathematical representation

Ship Resistance and Propulsion - Anthony F. Molland 2017-08-17

This second edition provides a comprehensive and scientific approach to evaluating ship resistance and propulsion. Written by experts in the field, it includes the latest developments in CFD, experimental techniques and guidance for the practical estimation of ship propulsive power. It addresses improvements in energy efficiency and reduced emissions, and the introduction of the Energy Efficiency Design Index (EEDI). Descriptions have now been included of pump jets, rim driven propulsors, shape adaptive foils, propeller noise and dynamic positioning. Trial procedures have been updated, and preliminary estimates of power for hydrofoil craft, submarines and AUVs are incorporated. Standard series data for hull resistance and propeller performance are included, enabling practitioners to make ship power predictions based on material and data within the book. Numerous fully worked examples illustrate applications for most ship and small craft types, making this book ideal for practising engineers, naval architects, marine engineers and undergraduate and postgraduate students.

Water Wave Mechanics For Engineers And Scientists - Robert A Dalrymple 1991-01-23

This book is intended as an introduction to classical water wave theory for the college senior or first year graduate student. The material is self-contained; almost all mathematical and engineering concepts are

presented or derived in the text, thus making the book accessible to practicing engineers as well. The book commences with a review of fluid mechanics and basic vector concepts. The formulation and solution of the governing boundary value problem for small amplitude waves are developed and the kinematic and pressure fields for short and long waves are explored. The transformation of waves due to variations in depth and their interactions with structures are derived. Wavemaker theories and the statistics of ocean waves are reviewed. The application of the water particle motions and pressure fields are applied to the calculation of wave forces on small and large objects. Extension of the linear theory results to several nonlinear wave properties is presented. Each chapter concludes with a set of homework problems exercising and sometimes extending the material presented in the chapter. An appendix provides a description of nine experiments which can be performed, with little additional equipment, in most wave tank facilities.

Ocean Wave Energy Conversion - Michael E. McCormick 2013-06-17

This volume will prove of vital interest to those studying the use of renewable resources. Scientists, engineers, and inventors will find it a valuable review of ocean wave mechanics as well as an introduction to wave energy conversion. It presents physical and mathematical descriptions of the nine generic wave energy conversion techniques, along with their uses and performance characteristics. Author Michael E. McCormick is the Corbin A. McNeill Professor of Naval Engineering at the U.S. Naval Academy. In addition to his timely and significant coverage of possible environmental effects associated with wave energy conversion, he provides a separate treatment of several electro-mechanical energy conversion techniques. Many worked examples throughout the book will be particularly useful to readers with a limited mathematical background. Those interested in research and development will benefit from the extensive bibliography.

Offshore Structures - Günther Claus 2014-09-25

This updated translation from the original German edition provides general background information on oceanology and ocean engineering is given, along with descriptions of drilling techniques, offshore structures and hydrocarbon production at sea. The main part of the book is concerned with the hydrostatic and hydrodynamic analysis of marine structures, followed by an evaluation of marine structure reliability. Environmental conditions affecting marine structures, wave statistics, and the application of reliability theory to code development are also discussed. Students and practising engineers who have an interest in the analysis of marine structures will find this book an invaluable reference.

Aero-hydrodynamics and the Performance of Sailing Yachts - Fabio Fossati 2009-12-18

A groundbreaking technical analysis of yacht design based on cutting edge research in the field of aero-hydrodynamics.

Encyclopedia of Systems and Control - John Baillieul 2015-07-29

The Encyclopedia of Systems and Control collects a broad range of short expository articles that describe the current state of the art in the central topics of control and systems engineering as well as in many of the related fields in which control is an enabling technology. The editors have assembled the most comprehensive reference possible, and this has been greatly facilitated by the publisher's commitment continuously to publish updates to the articles as they become available in the future. Although control engineering is now a mature discipline, it remains an area in which there is a great deal of research activity, and as new developments in both theory and applications become available, they will be included in the online version of the encyclopedia. A carefully chosen team of leading authorities in the field has written the well over 250 articles that comprise the work. The topics range from basic principles of feedback in servomechanisms to advanced topics such as the control of Boolean networks and evolutionary game theory. Because the content has been selected to reflect both foundational importance as well as subjects that are of current interest to the research and practitioner

communities, a broad readership that includes students, application engineers, and research scientists will find material that is of interest.

Propulsion - Justin Elliot Kerwin 2010

This book presents a comprehensive and up-to-date treatment of propeller analysis and design, including beginning with an introduction to various types of marine propulsion machinery, definitions of powers and efficiencies, and two- and three-dimensional airfoil theory. A section on three-dimensional hydrofoil theory introduces wake vortex sheets and three-dimensional vortex lines. These discussions topics are followed by linear lifting line- and lifting surface theory with both exact and approximate solution methods-including properties of helicoidal vortex sheets, optimum and arbitrary circulation distributions, and the Lerbs induction factor method. There are sections on model testing of propellers, propeller strength and followed by selection and design using both standard series charts and by circulation theory. The final section discusses ship standardization trials, their purpose, measurement methods and instruments, concluding with the analysis of trial data and derivation of the model-ship correlation allowance.

Marine Hydrodynamics, 40th anniversary edition - J. N. Newman 2018-01-26

A textbook that offers a unified treatment of the applications of hydrodynamics to marine problems. The applications of hydrodynamics to naval architecture and marine engineering expanded dramatically in the 1960s and 1970s. This classic textbook, originally published in 1977, filled the need for a single volume on the applications of hydrodynamics to marine problems. The book is solidly based on fundamentals, but it also guides the student to an understanding of engineering applications through its consideration of realistic configurations. The book takes a balanced approach between theory and empirics, providing the necessary theoretical background for an intelligent evaluation and application of empirical procedures. It also serves as an introduction to more specialized research methods. It unifies the seemingly diverse problems of marine hydrodynamics by examining them not as separate problems but as related applications of the general field of hydrodynamics. The book evolved from a first-year graduate course in MIT's Department of Ocean Engineering. A knowledge of advanced calculus is assumed. Students will find a previous introductory course in fluid dynamics helpful, but the book presents the necessary fundamentals in a self-contained manner. The 40th anniversary of this pioneering book offers a foreword by John Grue. Contents Model Testing

• The Motion of a Viscous Fluid • The Motion of an Ideal Fluid • Lifting Surfaces • Waves and Wave Effects • Hydrodynamics of Slender Bodies

Hydrodynamics of High-Speed Marine Vehicles - Odd M. Faltinsen 2006-01-09

Hydrodynamics of High-Speed Marine Vehicles, first published in 2006, discusses the three main categories of high-speed marine vehicles - vessels supported by submerged hulls, air cushions or foils. The wave environment, resistance, propulsion, seakeeping, sea loads and manoeuvring are extensively covered based on rational and simplified methods. Links to automatic control and structural mechanics are emphasized. A detailed description of waterjet propulsion is given and the effect of water depth on wash, resistance, sinkage and trim is discussed. Chapter topics include resistance and wash; slamming; air cushion-supported vessels, including a detailed discussion of wave-excited resonant oscillations in air cushion; and hydrofoil vessels. The book contains numerous illustrations, examples and exercises.

Handbook of Ocean Wave Energy - Arthur Pecher 2016-12-07

This book is open access under a CC BY-NC 2.5 license. This book offers a concise, practice-oriented reference-guide to the field of ocean wave energy. The ten chapters highlight the key rules of thumb, address all the main technical engineering aspects and describe in detail all the key aspects to be considered in the techno-economic assessment of wave energy converters. Written in an easy-to-understand style, the book answers questions relevant to readers of different backgrounds, from developers, private and public investors, to students and researchers. It is thereby a valuable resource for both newcomers and experienced practitioners in the wave energy sector.

Design Principles of Ships and Marine Structures - Suresh Chandra Misra 2015-12-01

The Definitive Reference for Designers and Design Students A solid grasp of the fundamentals of materials, along with a thorough understanding of load and design techniques, provides the components needed to complete a marine platform design. Design Principles of Ships and Marine Structures details every facet of ship design and design integration, and highlights the design aspects that must be put together

to create an integrated whole product. This book discusses naval architecture and marine engineering applications and principles relevant to the design of various systems, examines advanced numerical techniques that can be applied to maritime design procedure at the concept design stage, and offers a comprehensive approach to the subject of ship design. Covers the Entire Sphere of Marine Design The book begins with an introduction to marine design and the marine environment, describing many of the marine products that are used for transportation, defense and the exploitation of marine resources. It also discusses stability issues relevant to ship design, as well as hydrodynamic aspects of resistance, propulsion, sea keeping and maneuvering, and their effects on design. In addition to covering the various systems and sub-systems that go into making a complex product to be used in maritime environment, the author explains engineering economics and its application in ship design, and provides examples wherever necessary. Written by an author with more than 35 years of teaching experience, this book: Describes various design methodologies such as sequential design process with the application of concurrent engineering and set based design factors in the use of computer-aided design techniques Highlights the shape design methodology of ship forms and layout design principles Considers design aspects relative to safety and risk assessment Introduces the design for production aspects in marine product development Discusses design principles for sustainability Explains the principles of numerical optimization for decision-making Design Principles of Ships and Marine Structures focuses on ship design efficiency, safety, sustainability, production, and management, and appeals to students and design professionals in the field of shipping, shipbuilding and offshore engineering.

Ocean Wave Energy - Joao Cruz 2007-12-22

The authors of this timely reference provide an updated and global view on ocean wave energy conversion - and they do so for wave energy developers as well as for students and professors. The book is orientated to the practical solutions that this new industry has found so far and the problems that any device needs to face. It describes the actual principles applied to machines that convert wave power to electricity and examines state-of-the-art modern systems.

Marine Anthropogenic Litter - Melanie Bergmann 2015-06-01

This book describes how man-made litter, primarily plastic, has spread into the remotest parts of the oceans and covers all aspects of this pollution problem from the impacts on wildlife and human health to socio-economic and political issues. Marine litter is a prime threat to marine wildlife, habitats and food webs worldwide. The book illustrates how advanced technologies from deep-sea research, microbiology and mathematic modelling as well as classic beach litter counts by volunteers contributed to the broad awareness of marine litter as a problem of global significance. The authors summarise more than five decades of marine litter research, which receives growing attention after the recent discovery of great oceanic garbage patches and the ubiquity of microscopic plastic particles in marine organisms and habitats. In 16 chapters, authors from all over the world have created a universal view on the diverse field of marine litter pollution, the biological impacts, dedicated research activities, and the various national and international legislative efforts to combat this environmental problem. They recommend future research directions necessary for a comprehensive understanding of this environmental issue and the development of efficient management strategies. This book addresses scientists, and it provides a solid knowledge base for policy makers, NGOs, and the broader public.

Introduction to Fluid Mechanics - James A. Fay 1994

Introduction to Fluid Mechanics is a mathematically efficient introductory text for a basal course in mechanical engineering. More rigorous than existing texts in the field, it is also distinguished by the choice and order of subject matter, its careful derivation and explanation of the laws of fluid mechanics, and its attention to everyday examples of fluid flow and common engineering applications. Beginning with the simple and proceeding to the complex, the text introduces the principles of fluid mechanics in orderly steps. At each stage practical engineering problems are solved, principally in engineering systems such as dams, pumps, turbines, pipe flows, propellers, and jets, but with occasional illustrations from physiological and meteorological flows. The approach builds on the student's experience with everyday fluid mechanics, showing how the scientific principles permit a quantitative understanding of what is happening and provide a basis for designing engineering systems that achieve the desired objectives. Introduction to Fluid Mechanics differs from most engineering texts in several respects:

The derivations of the fluid principles (especially the conservation of energy) are complete and correct, but concisely given through use of the theorems of vector calculus. This saves considerable time and enables the student to visualize the significance of these principles. More attention than usual is given to unsteady flows and their importance in pipe flow and external flows. Finally, the examples and exercises illustrate real engineering situations, including physically realistic values of the problem variables. Many of these problems require calculation of numerical values, giving the student experience in judging the correctness of his or her numerical skills.

The Maritime Engineering Reference Book - Anthony F. Molland 2011-10-13

The Maritime Engineering Reference Book is a one-stop source for engineers involved in marine engineering and naval architecture. In this essential reference, Anthony F. Molland has brought together the work of a number of the world's leading writers in the field to create an inclusive volume for a wide audience of marine engineers, naval architects and those involved in marine operations, insurance and other related fields. Coverage ranges from the basics to more advanced topics in ship design, construction and operation. All the key areas are covered, including ship flotation and stability, ship structures, propulsion, seakeeping and maneuvering. The marine environment and maritime safety are explored as well as new technologies, such as computer aided ship design and remotely operated vehicles (ROVs). Facts, figures and data from world-leading experts makes this an invaluable ready-reference for those involved in the field of maritime engineering. Professor A.F. Molland, BSc, MSc, PhD, CEng, FRINA. is Emeritus Professor of Ship Design at the University of Southampton, UK. He has lectured ship design and operation for many years. He has carried out extensive research and published widely on ship design and various aspects of ship hydrodynamics. * A comprehensive overview from best-selling authors including Bryan Barrass, Rawson and Tupper, and David Eyres * Covers basic and advanced material on marine engineering and Naval Architecture topics * Have key facts, figures and data to hand in one complete reference book

Sea Loads on Ships and Offshore Structures - O. Faltinsen 1993-09-23

After introducing the theory of the structural loading on ships and offshore structures based on the motions of wind, waves and currents, this text demonstrates its applications to conventional and non-conventional sea vessels, including extensive exercises and examples.

The Dynamics of Marine Craft - Edward M Lewandowski 2004-07-14

This book presents a theoretical treatment, as well as a summary of practical methods of computation, of the forces and moments that act on marine craft. Its aim is to provide the tools necessary for the prediction or simulation of craft motions in calm water and in waves. In addition to developing the required equations, the author gives relations that permit at least approximate evaluation of the coefficients so that useful results can be obtained. The approach begins with the equations of motion for rigid bodies, relative to fixed- and moving-coordinate systems; then, the hydrodynamic forces are examined, starting with hydrostatics and progressing to the forces on a moving vehicle in calm water and (after a review of water-wave theory) in waves. Several detailed examples are presented, including calculations of hydrostatics, horizontal- and vertical-plane directional stability, and wave-induced motions. Also included are unique discussions on various effects, such as fin-hull interactions, numerical stability of integrators, heavy torpedoes, and the dynamics of high-speed craft. The book is intended to be an introductory-level graduate text and a reference for the practicing professional.

Contents: Dynamics of Rigid Bodies Calm Water Behavior of Marine Vehicles at Zero Speed: Hydrostatics Calm Water Behavior of Marine Vehicles with Forward Speed: Maneuvering Water Waves Wave-Induced Forces on Marine Craft Dynamics of High-Speed Craft Readership: Advanced undergraduates, graduate students and practicing professionals in ocean engineering. Keywords:

Practical Ship Hydrodynamics - Volker Bertram 2011-08-11

Practical Ship Hydrodynamics provides a comprehensive overview of hydrodynamic experimental and numerical methods for ship resistance and propulsion, maneuvering, seakeeping and vibration. Beginning with an overview of problems and approaches, including the basics of modeling and full scale testing, expert author Volker Bertram introduces the marine applications of computational fluid dynamics and boundary element methods. Expanded and updated, this new edition includes: Otherwise disparate information on the factors affecting ship hydrodynamics, combined to provide one practical, go-to resource. Full coverage of new developments in computational methods and model

testing techniques relating to marine design and development. New chapters on hydrodynamic aspects of ship vibrations and hydrodynamic options for fuel efficiency, and increased coverage of simple design estimates of hydrodynamic quantities such as resistance and wake fraction. With a strong focus on essential background for real-life modeling, this book is an ideal reference for practicing naval architects and graduate students.

Marine Hydrodynamics - John Nicholas Newman 1977

A textbook that offers a unified treatment of the applications of hydrodynamics to marine problems. The applications of hydrodynamics to naval architecture and marine engineering expanded dramatically in the 1960s and 1970s. This classic textbook, originally published in 1977, filled the need for a single volume on the applications of hydrodynamics to marine problems. The book is solidly based on fundamentals, but it also guides the student to an understanding of engineering applications through its consideration of realistic configurations. The book takes a balanced approach between theory and empirics, providing the necessary theoretical background for an intelligent evaluation and application of empirical procedures. It also serves as an introduction to more specialized research methods. It unifies the seemingly diverse problems of marine hydrodynamics by examining them not as separate problems but as related applications of the general field of hydrodynamics. The book evolved from a first-year graduate course in MIT's Department of Ocean Engineering. A knowledge of advanced calculus is assumed. Students will find a previous introductory course in fluid dynamics helpful, but the book presents the necessary fundamentals in a self-contained manner. The 40th anniversary of this pioneering book offers a foreword by John Grue. Contents Model Testing " The Motion of a Viscous Fluid " The Motion of an Ideal Fluid " Lifting Surfaces " Waves and Wave Effects " Hydrodynamics of Slender Bodies. **Twenty-First Symposium on Naval Hydrodynamics** - National Research Council 1997-09-11

Hydrodynamic Control of Wave Energy Devices - Umesh A. Korde 2016-09-26

With this self-contained and comprehensive text, students and researchers will gain a detailed understanding of the fundamental aspects of the hydrodynamic control of wave energy converters. Such control is necessary to maximise energy capture for a given device configuration and plays a major role in efforts to make wave energy economic. Covering a wide range of disciplines, the reader is taken from the mathematical and technical fundamentals, through the main pillars of wave energy hydrodynamic control, right through to state-of-the-art algorithms for hydrodynamic control. The various operating principles of wave energy converters are exposed and the unique aspects of the hydrodynamic control problem highlighted, with a variety of potential solutions discussed. Supporting material on wave forecasting and the interaction of the hydrodynamic control problem with other aspects of wave energy device optimisation, such as device geometry optimisation and optimal device array layout, is also provided.

An Assessment of Naval Hydromechanics Science and Technology - National Research Council 2000-05-17

The Department of the Navy maintains a vigorous science and technology (S&T) research program in those areas that are critically important to ensuring U.S. naval superiority in the maritime environment. A number of these areas depend largely on sustained Navy Department investments for their health, strength, and growth. One such area is naval hydromechanics, that is, the study of the hydrodynamic and hydroacoustic performance of Navy ships, submarines, underwater vehicles, and weapons. A fundamental understanding of naval hydromechanics provides direct benefits to naval warfighting capabilities through improvements in the speed, maneuverability, and stealth of naval platforms and weapons. An Assessment of Naval Hydromechanics Science and Technology is an assessment of S&T research in the area of naval hydromechanics. This report assesses the Navy's research effort in the area of hydromechanics, identifies non-Navy-sponsored research and development efforts that might facilitate progress in the area, and provides recommendations on how the scope of the Navy's research program should be focused to meet future objectives.

Twenty-Second Symposium on Naval Hydrodynamics - National Research Council 2000-03-02

The Twenty-Second Symposium on Naval Hydrodynamics was held in Washington, D.C., from August 9-14, 1998. It coincided with the 100th anniversary of the David Taylor Model Basin. This international symposium was organized jointly by the Office of Naval Research

(Mechanics and Energy Conversion S&T Division), the National Research Council (Naval Studies Board), and the Naval Surface Warfare Center, Carderock Division (David Taylor Model Basin). This biennial symposium promotes the technical exchange of naval research developments of common interest to all the countries of the world. The forum encourages both formal and informal discussion of the presented papers, and the occasion provides an opportunity for direct communication between international peers.

Principles of Naval Architecture: Resistance, propulsion and vibration - Edward V. Lewis 1988

Twenty-Fourth Symposium on Naval Hydrodynamics - National Research Council 2003-11-15

This report is part of a series of reports that summarize this regular event. The report discusses research developments in ship design, construction, and operation in a forum that encouraged both formal and informal discussion of presented papers.

The Dynamics of Marine Craft - Edward M. Lewandowski 2004

This book presents a theoretical treatment, as well as a summary of practical methods of computation, of the forces and moments that act on marine craft. Its aim is to provide the tools necessary for the prediction or simulation of craft motions in calm water and in waves. In addition to developing the required equations, the author gives relations that permit at least approximate evaluation of the coefficients so that useful results can be obtained. The approach begins with the equations of motion for rigid bodies, relative to fixed- and moving-coordinate systems; then, the hydrodynamic forces are examined, starting with hydrostatics and progressing to the forces on a moving vehicle in calm water and (after a review of water-wave theory) in waves. Several detailed examples are presented, including calculations of hydrostatics, horizontal- and vertical-plane directional stability, and wave-induced motions. Also included are unique discussions on various effects, such as fin-hull interactions, numerical stability of integrators, heavy torpedoes, and the dynamics of high-speed craft. The book is intended to be an introductory-level graduate text and a reference for the practicing professional.

Hydrodynamics of Ship Propellers - John P. Breslin 1996-11-13

Technical introduction to ship propeller hydrodynamics, for researchers in ocean technology, naval architecture, mechanical engineering.

Handbook of Marine Craft Hydrodynamics and Motion Control -

Thor I. Fossen 2021-04-16

Handbook of MARINE CRAFT HYDRODYNAMICS AND MOTION CONTROL The latest tools for analysis and design of advanced GNC systems Handbook of Marine Craft Hydrodynamics and Motion Control is an extensive study of the latest research in hydrodynamics, guidance, navigation, and control systems for marine craft. The text establishes how the implementation of mathematical models and modern control theory can be used for simulation and verification of control systems, decision-support systems, and situational awareness systems. Coverage includes hydrodynamic models for marine craft, models for wind, waves and ocean currents, dynamics and stability of marine craft, advanced guidance principles, sensor fusion, and inertial navigation. This important book includes the latest tools for analysis and design of advanced GNC systems and presents new material on unmanned underwater vehicles, surface craft, and autonomous vehicles. References and examples are included to enable engineers to analyze existing projects before making their own designs, as well as MATLAB scripts for hands-on software development and testing. Highlights of this Second Edition include: Topical case studies and worked examples demonstrating how you can apply modeling and control design techniques to your own designs A Github repository with MATLAB scripts (MSS toolbox) compatible with the latest software releases from Mathworks New content on mathematical modeling, including models for ships and underwater vehicles, hydrostatics, and control forces and moments New methods for guidance and navigation, including line-of-sight (LOS) guidance laws for path following, sensory systems, model-based navigation systems, and inertial navigation systems This fully revised Second Edition includes innovative research in hydrodynamics and GNC systems for marine craft, from ships to autonomous vehicles operating on the surface and under water. Handbook of Marine Craft Hydrodynamics and Motion Control is a must-have for students and engineers working with unmanned systems, field robots, autonomous vehicles, and ships. MSS toolbox: <https://github.com/cybergalactic/mss> Lecture notes: <https://www.fossen.biz/wiley> Author's home page: <https://www.fossen.biz>

Marine Rudders and Control Surfaces - Anthony F. Molland 2011-02-24

Marine Rudders and Control Surfaces guides naval architects from the first principles of the physics of control surface operation, to the use of experimental and empirical data and applied computational fluid dynamic modelling of rudders and control surfaces. The empirical and theoretical methods applied to control surface design are described in depth and their use explained through application to particular cases. The design procedures are complemented with a number of worked practical examples of rudder and control surface design. • The only text dedicated to marine control surface design • Provides experimental, theoretical and applied design information valuable for practising engineers, designers and students • Accompanied by an online extensive experimental database together with software for theoretical predictions and design development

A Holistic Approach to Ship Design - Apostolos Papanikolaou 2018-12-11

This book introduces a holistic approach to ship design and its optimisation for life-cycle operation. It deals with the scientific background of the adopted approach and the associated synthesis model, which follows modern computer aided engineering (CAE) procedures. It integrates techno-economic databases, calculation and multi-objective optimisation modules and s/w tools with a well-established Computer-Aided Design (CAD) platform, along with a Virtual Vessel Framework (VVF), which will allow virtual testing before the building phase of a new vessel. The resulting graphic user interface (GUI) and information exchange systems enable the exploration of the huge design space to a much larger extent and in less time than is currently possible, thus leading to new insights and promising new design alternatives. The book not only covers the various stages of the design of the main ship system, but also addresses relevant major onboard systems/components in terms of life-cycle performance to offer readers a better understanding of suitable outfitting details, which is a key aspect when it comes the outfitting-intensive products of international shipyards. The book disseminates results of the EU funded Horizon 2020 project HOLISHIP.

Worlds of Flow - Olivier Darrigol 2005-09

This book provides the first fully-fledged history of hydrodynamics, including lively accounts of the concrete problems of hydraulics, navigation, blood circulation, meteorology, and aeronautics that motivated the main conceptual innovations. Richly illustrated, technically competent, and philosophically sensitive, it should attract a broad audience and become a standard reference for any one interested in fluid mechanics.

Petroleum and Marine Technology Information Guide - J. Hutcheon 2003-09-02

First published in 1981 as the Offshore Information Guide this guide to information sources has been hailed internationally as an indispensable handbook for the oil, gas and marine industries.

Submarine Hydrodynamics - Martin Renilson 2018-04-20

This book covers specific aspects of submarine hydrodynamics in a very practical manner. The author reviews basic concepts of ship hydrodynamics and goes on to show how they are applied to submarines, including a look at the use of physical model experiments. The book is intended for professionals working in submarine hydrodynamics, as well as for advanced students in the field. This revised edition includes updated information on empirical methods for predicting the hydrodynamic manoeuvring coefficients, and for predicting the resistance of a submarine. It also includes new material on how to assess propulsors, and includes measures of wake distortion, which has a detrimental influence on propulsor performance. Additional information on safe manoeuvring envelopes is also provided. The wide range of references has been updated to include the latest material in the field.

Ship Resistance and Flow - Lars Larsson 2010

This volume contains a completely new presentation of the subject of ship resistance embodying these developments. A major goal in the design of virtually all vessels is to obtain a hull form having low resistance. In achieving this goal, the accurate prediction of resistance for a given hull geometry is essential. Since the publication of the previous edition of PNA important advances have been made in theoretical and computational fluid dynamics accompanied by increased use of such work in ship and offshore structure design.

Handbook of Mathematical Techniques for Wave/Structure Interactions - C.M. Linton 2001-02-26

Although a wide range of mathematical techniques can apply to solving problems involving the interaction of waves with structures, few texts discuss those techniques within that context-most often they are presented without reference to any applications. Handbook of Mathematical Techniques for Wave/Structure Interactions brings

together some of the most important techniques useful to applied mathematicians and engineers. Each chapter is dedicated to a particular technique, such as eigenfunction expansions, multipoles, integral equations, and Wiener-Hopf methods. Other chapters discuss approximation techniques and variational methods. The authors describe all of the techniques in terms of wave/structure interactions, with most illustrated by application to research problems. They provide detailed explanations of the important steps within the mathematical development, and, where possible, physical interpretations of mathematical results. *Handbook of Mathematical Techniques for Wave/Structure Interactions* effectively bridges the gap between the heavy computational methods preferred by some engineers and the more mathematical approach favored by others. These techniques provide a powerful means of dealing with wave/structure interactions, are readily applied to relevant problems, and illuminate those problems in a way that neither a purely computational approach nor a straight theoretical treatment can.

Analytical Methods in Marine Hydrodynamics - Ioannis K. Chatjigeorgiou 2018-05-31

The value of analytical solutions relies on the rigorous formulation, and a strong mathematical background. This comprehensive volume unifies the most important geometries, which allow for the development of analytical solutions for hydrodynamic boundary value problems. It offers detailed explanations of the Laplace domain and numerical results associated with such problems, providing deep insight into the theory of hydrodynamics. Extended numerical calculations are provided and discussed, allowing the reader to use them as benchmarks for their own computations and making this an invaluable resource for specialists in various disciplines, including hydrodynamics, acoustics, optics, electrostatics, and brain imaging.

Hydroelasticity of Ships - R. E. D. Bishop 1979-12-27

Good, No Highlights, No Markup, all pages are intact, Slight Shelfwear, may have the corners slightly dented, may have slight color

changes/slightly damaged spine.

Sloshing - Odd M. Faltinsen 2014-03-06

This book presents sloshing with marine and land-based applications, with a focus on ship tanks. It also includes the nonlinear multimodal method developed by the authors and an introduction to computational fluid dynamics. Emphasis is also placed on rational and simplified methods, including several experimental results. Topics of special interest include antirolling tanks, linear sloshing, viscous wave loads, damping, and slamming. The book contains numerous illustrations, examples, and exercises.

Marine Hydrodynamics, 40th anniversary edition - J. N. Newman 2018-01-26

A textbook that offers a unified treatment of the applications of hydrodynamics to marine problems. The applications of hydrodynamics to naval architecture and marine engineering expanded dramatically in the 1960s and 1970s. This classic textbook, originally published in 1977, filled the need for a single volume on the applications of hydrodynamics to marine problems. The book is solidly based on fundamentals, but it also guides the student to an understanding of engineering applications through its consideration of realistic configurations. The book takes a balanced approach between theory and empirics, providing the necessary theoretical background for an intelligent evaluation and application of empirical procedures. It also serves as an introduction to more specialized research methods. It unifies the seemingly diverse problems of marine hydrodynamics by examining them not as separate problems but as related applications of the general field of hydrodynamics. The book evolved from a first-year graduate course in MIT's Department of Ocean Engineering. A knowledge of advanced calculus is assumed. Students will find a previous introductory course in fluid dynamics helpful, but the book presents the necessary fundamentals in a self-contained manner. The 40th anniversary of this pioneering book offers a foreword by John Grue. Contents Model Testing • The Motion of a Viscous Fluid • The Motion of an Ideal Fluid • Lifting Surfaces • Waves and Wave Effects • Hydrodynamics of Slender Bodies