Water Wave Mechanics For Engineers And Scientists Solution Manual

This book is based on the author's experiences in engineering practice and in the classroom. The introductory topics in wave mechanics and the presentation of such have their foundations in the courses taught at the U.S. Naval Academy. The advanced topics have their origins in the postgraduate courses taught at the Johns Hopkins University.

If you need a book that relates the core principles of quantum mechanics to modern applications in engineering, physics, and nanotechnology, this is it. Students will appreciate the book's applied emphasis, which illustrates theoretical concepts with examples of nanostructured materials, optics, and semiconductor devices. The many worked examples and more than 160 homework problems help students to problem solve and to practise applications of theory. Without assuming a prior knowledge of high-level physics or classical mechanics, the text introduces Schrödinger's equation, operators, and approximation methods. Systems, including the hydrogen atom and crystalline materials, are analyzed in detail. More advanced subjects, such as density matrices, quantum optics, and quantum information, are also covered. Practical applications and algorithms for the computational analysis of simple structures make this an ideal introduction to quantum mechanics for students of engineering, physics, nanotechnology, and other disciplines. Additional resources available from www.cambridge.org/9780521897839.

Random waves are the most important constituent of the sea environment. They make the design of maritime structures quite different from that of structures on land. In this book, the concept of randomness in waves for the design of breakwaters, seawalls, and harbor structures is fully explored for easy comprehension by practicing engineers. Theoretical aspects are also discussed in detail for further studies by graduate students and researchers. Several additions have been made to this second edition, including a new chapter on extreme wave statistics.

This book covers water waves, surf zone hydrodynamics, tides in oceans and estuaries, storm surges, estuarine mixing, basic sediment transport, coastal morphodynamics and coastal groundwater dynamics. It is an introductory treatment, suitable for a first course in coastal and estuarine processes for earth scientists or engineers. Yet, there are substantial amounts of new material that are included, such as the explicit, analytical treatment of transient, forced long waves. Inclusion of this material will in turn strongly enhance the introductory treatment of tsunami, storm surges and surf beat. The treatment of sine wave theory emphasizes expressions which are explicit in the water depth h (using koh instead of kh) so that they can easily be differentiated or integrated with respect to h. This is a major pedagogical advantage because of the enhanced transparency. The treatment of turbulent mixing includes finite mixing length effects which provide an explanation for differential diffusion of different sediment sizes in suspension. The effects of acceleration skewness and boundary layer streaming are also included in the basic sediment transport models. The inclusion of beach groundwater dynamics —including the mechanisms by which waves as well as tides drive groundwater motion —provides a link between the previously unconnected fields of coastal hydraulics and regional groundwater modeling. Serving as a good reference book, it is fully indexed and comprehensively cross referenced. Abundant references to more detailed texts are also provided.

Mechanics of Coastal Sediment Transport
Ocean Engineering Mechanics
Hydrodynamics Around Cylindrical Structures
Water Wave Mechanics For Engineers And Scientists
Quantum Mechanics for Scientists and Engineers

"It came from nowhere, snapping giant ships in two. No one believed the survivors . . . until now" —New Scientist magazine cover, June 30, 2001 Rogue waves are the focus of this book. They are among the waves naturally - served by people on the sea surface that represent an inseparable feature of the Ocean. Rogue waves appear from nowhere, cause danger, and disappear at once. They may occur on the surface of a relatively calm sea and not reach very high amplitudes, but still be fatal for ships and crew due to their unexpectedness and abnormal features. Seamen are known to be unsurpassed authors of exciting and horrifying stories about the sea and sea waves. This could explain why, despite the increasing number of documented cases, that sailors' observations of "walls of - ter" have been considered ctitious for a while. These stories are now addressed again due to the amount of doubtless evidence of the existence of the phenomenon, but still without suf cient information to - able interested researchers and engineers to completely understand it. The billows appear suddenly, exceeding the surrounding waves by two times their size and more, and obtaining many names: abnormal, exceptional, extreme, giant, huge, s- den, episodic, freak, monster, rogue, vicious, killer, mad- or rabid-dog waves, cape rollers, holes in the sea, walls of water, three sisters, etc.

An introduction to classical water wave theory for college seniors or first-year graduate students. Almost all the necessary mathematical and engineering concepts are either presented or derived in the text, making it also useful as a reference for practicing engineers. Paper edition (0421-3), $28. Acidic paper. Annotation copyrighted by Book News, Inc., Portland, OR

Text on coastal engineering and oceanography covering theory and applications intended to mitigate shoreline erosion.

In a unitary way, this monograph deals with a wide range of subjects related to the mechanics of sea waves. The book highlights recent theoretical results on the dynamics of random wind-generated waves, on long-term wave statistics, and on beach planform evolution. A fresh approach is given to more traditional concepts. For example, new evidence from a recent series of small-scale field experiments is used to introduce some crucial topics like wave forces. Also, the book gives some worked examples for the design of offshore or coastal structures. An exciting subject dealt with in the book is the quasi-deterministic mechanics of three-dimensional wave groups in sea storms, and the loads exerted by these wave groups on offshore structures. The text is intended for researchers and graduate students in ocean engineering, but may also be understood by undergraduates. The more complex concepts are explained with examples or more extensive case studies.

Advances in Numerical Simulation of Nonlinear Water Waves
Wave Mechanics for Ocean Engineering
Applications in Marine Structures
Beach Nourishment
Coastal and Estuarine Processes

Most of the Earth''s surface is covered by water. Our everyday lives and activities are affected by water waves in oceans, such as the tsunami that occurred in the Indian Ocean on 26 December 2004. This indicates how important it is for us to fully understand water waves, in particular the very large ones. One way to do so is to perform numerical simulation based on the nonlinear theory. Considerable research advances have been made in this area over the past decade by developing various numerical methods and

applying them to emerging problems; however, until now there has been no comprehensive book to reflect these advances. This unique volume aims to bridge this gap. This book contains 18 self-contained chapters written by more than 50 authors from 12 different countries, many of whom are world-leading experts in the field. Each chapter is based mainly on the pioneering work of the authors and their research teams over the past decades.The chapters altogether deal with almost all numerical methods that have so far been employed to simulate nonlinear water waves and cover many important and very interesting applications, such as overturning waves, breaking waves, waves generated by landslides, freak waves, solitary waves, tsunamis, sloshing waves, interaction of extreme waves with beaches, interaction with fixed structures, and interaction with free-response floating structures. Therefore, this book provides a comprehensive overview of the state-of-the-art research and key achievements in numerical modeling of nonlinear water waves, and serves as a unique reference for postgraduates, researchers and senior engineers working in industry.

The aim of this book is to present selected theoretical topics on ocean wave dynamics, including basic principles and applications in coastal and offshore engineering, all from the deterministic point of view. The bulk of the material deals with the linearized theory.

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.

This text introduces and draws together pertinent aspects of fluid dynamics, physical oceanography, solid mechanics, and organismal biology to provide a much-needed set of tools for quantitatively examining the biological effects of ocean waves. "Nowhere on earth does water move as violently as on wave-swept coasts," writes the author, "and every breaker that comes pounding on the shore places large hydrodynamic forces on the organisms resident there." Yet wave-swept coral reefs and rocky shores are home to some of the world's most diverse assemblages of plants and animals, and scientists have chosen these environments to carry out much of the recent experimental work in community structure and population dynamics. Until now these studies have been hampered because biologists often lack a working understanding of the mechanics of the wave-swept shore. Mark Denny here supplies that understanding in clear and vivid language. Included are an introduction to wave-induced water motions and the standard theories for describing them, a broad introduction to the hydrodynamic forces these water movements place on plants and animals, and an explanation of how organisms respond to these forces. These tools are put to use in the final chapters in an examination of the mechanisms of "wave exposure" and an exploration of the mechanical determinants of size and shape in wave-swept environments. Originally published in 1988. The Princeton Legacy Library uses the latest print-on-demand technology to again make available previously out-of-print books from the distinguished backlist of Princeton University Press. These editions preserve the original texts of these important books while presenting them in durable paperback and hardcover editions. The goal of the Princeton Legacy Library is to vastly increase access to the rich scholarly heritage found in the thousands of books published by Princeton University Press since its founding in 1905.

Ocean Engineering Wave Mechanics
Introduction to Coastal Engineering and Management
Random Seas and Design of Maritime Structures
Hydrodynamics, Power Takeoff and Control Systems
Numerical Simulation of Water Waves

The second edition (1997) of this text was a completely rewritten version of the original text Basic Coastal Engineering published in 1978. This third edition makes several corrections, improvements and additions to the second edition. Basic Coastal Engineering is an introductory text on wave mechanics and coastal processes along with fundamentals that underline the practice of coastal engineering. This book was written for a senior or first postgraduate course in coastal engineering. It is also suitable for self study by anyone having a basic engineering or physical science background. The level of coverage does not require a math or fluid mechanics background beyond that presented in a typical undergraduate civil or mechanical engineering curriculum. The material p-sented in this text is based on the author's lecture notes from a one-semester course at Virginia Polytechnic Institute, Texas A&M University, and George Washington University, and a senior elective course at Lehigh University. The text contains examples to demonstrate the various analysis techniques that are presented and each chapter (except the first and last) has a collection of problems for the reader to solve that further demonstrate and expand upon the text material. Chapter 1 briefly describes the coastal environment and introduces the re- tively new field of coastal engineering. Chapter 2 describes the two-dimensional characteristics of surface waves and presents the small-amplitude wave theory to support this description.

Accompanying CD-ROM in pocket at the back of book

This book is intended as an introductory textbook for graduate students and as a reference book for engineers and scientists working in the field of coastal engineering. As such it gives a description of the theories for wave and nearshore hydrodynamics. It is meant to de-mystify the topics and hence starts at a fairly basic level. It requires knowledge of fluid mechanics equivalent to a first year graduate level. At the end of each topic, an attempt is made to give an overview of the present stage of the scientific development in that area with numerous references for further studies.

This is a textbook aimed at graduate students and offshore engineering practitioners that covers basic fluid mechanics and the deterministic and statistical descriptions of infinitesimal and finite amplitude water waves. It reviews the theory of wave loading on structures and closes with a chapter on the potential of ocean wave energy and devices for extracting it. Since the 1980s there has been tremendous progress in numerical and physical modelling of coastal and offshore structures in waves. This calls for a clear understanding of the phenomena of wave generation, propagation, deformation and its effects on marine structures. This book will help the reader to

understand the many results and descriptions found in journals, reports and research papers. It is self-contained, and encompasses the fundamentals of the subject with sufficient description and illustrations.
Water Wave Mechanics for Engineers and Scientists
Handbook of Ocean Wave Energy
Wave Mechanics and Wave Loads on Marine Structures
The Applied Dynamics Of Ocean Surface Waves
Coastal Processes with Engineering Applications

The book derives the mathematical basis for the most encountered waves in science and engineering. It gives the basis to undertake calculations required for important occupations such as maritime engineering, climate science, urban noise control, and medical diagnostics. The book initiates with fluid dynamics basis with subsequent chapters covering surface gravity waves, sound waves, internal gravity waves and waves in rotating fluids, and details basic phenomena such as refraction. Thereafter, specialized application chapters include description of specific contemporary problems. All concepts are supported by narrative examples, illustrations, and case studies. Features:- Explains the basis of wave mechanics in fluid systems. Provides tools for the analysis of water waves, sound waves, internal gravity, and rotating fluid waves through different examples. Includes comprehensible mathematical derivations at the expense of fewer theoretical topics. Reviews cases describable by linear theory and cases requiring nonlinear and wave-interaction theories. Supports concepts with narrative examples, illustrations, and case studies. This book aims at Senior Undergraduates/Graduate students and Researchers in Fluid Mechanics, Applied Mathematics, Mechanical Engineering, Civil Engineering, and Physical Oceanography.

This book is written for engineers, students of coastal processes and laypersons interested in beach nourishment, which consists of the placement of large quantities of good quality sediment on the beach to advance the shoreline seaward. The improvement of project performance through proper design and the predictability of performance are emphasized. The overall longevity of a project is addressed as are local erosional areas. The roles which wave height, project length and sediment quality play in project performance are addressed quantitatively. The results are illustrated through reference to a number of monitored nourishment projects. Biological and economic aspects of beach nourishment are addressed.

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.

This 2002 book examines the interaction between ocean waves and oscillating systems. With a focus on linear analysis of low-amplitude waves, the text is designed to convey a thorough understanding of wave interactions. Topics covered include the background mathematics of oscillations, gravity waves on water, the dynamics of wave-body interactions, and the absorption of wave energy by oscillating bodies. Linear algebra, complex numbers, differential equations, and Fourier transformation are utilized as bases for the analysis, and each chapter ends with problems. While the book's focus is on linear theory, the practical application of energy storage and transport is interwoven throughout. This book will be appropriate for those with backgrounds in elementary fluid dynamics or hydrodynamics and mathematical analysis. Graduate students and researchers will find it an excellent source of wave energy theory and application.
Rogue Waves in the Ocean
Ocean Waves and Oscillating Systems

River Mechanics
Linear Interactions Including Wave-Energy Extraction
Completely updated and with three new chapters, this analysis of river dynamics is invaluable for advanced students, researchers and practitioners.
Wave Mechanics and Wave Loads on Marine Structures provides a new perspective on the calculation of wave forces on ocean structures, unifying the deterministic and probabilistic approaches to wave theory and combining the methods used in field and experimental measurement. Presenting his quasi-determinism (QD) theory and approach of using small-scale field experiments (SSFEs), author Paolo Boccotti simplifies the findings and techniques honed in his ground-breaking work to provide engineers and researchers with practical new methods of analysis. Including numerous worked examples and case studies, Wave Mechanics and Wave Loads on Marine Structures also discusses and provides useful FORTRAN programs, including a subroutine for calculating particle velocity and acceleration in wave groups, and programs for calculating wave loads on several kinds of structures. Solves the conceptual separation of deterministic and stochastic approaches to wave theory seen in other resources through the application of quasi-determinism (QD) theory Combines the distinct experimental activities of field measurements and wave tank experiment using small-scale field experiments (SSFEs) Simplifies and applies the ground-breaking work and techniques of this leading expert in wave theory and marine construction
Water Wave Mechanics For Engineers And ScientistsWorld Scientific Publishing Company
The papers which follow were presented at an Internatisonal Sym posium held in Lisbon from 8-11 July 1985 on the Hydrodynamics of Ocean Wave-Energy Utilization and sponsored by the Interna tional Union of Theoretical and Applied Mechanics. The subject of the Symposium embraced wave statistics, numerical methods, theoretical, experimental and field studies of wave energy devices. The idea of extracting useful energy from ocean waves continues to attract the curiosity of scientists and engineers in many parts of the world as the following papers indicate. Increasing ly the trend is towards smaller devices suitable for use near remote island communities where wave power, as an alternative to costly diesel fuel for electric generators, is already very competitive in economic terms. The decision to build two different prototype wave-power devices into the cliffs off Bergen in Norway has provided a welcome impetus to the field, stimulating a large amount of

theoretical work on oscillating water column-type devices. In particular phase control methods — in which force and velocity of a rigid body, or pressure and volume flux across a turbine are matched in phase to achieve maximum power output — rightfully occupy a central place in the papers that follow. In addition to the established workers in the field, a new ge neration of wave-energy enthusiasts is emerging, learning from the mistakes of others and contributing exciting ideas of both a conceptual and practical nature.

Introduction to Nearshore Hydrodynamics
Water Wave Kinematics
Ocean Wave Energy Systems
A Modern Introduction to the Mathematical Theory of Water Waves
Basic Wave Mechanics

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 ε 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 comparing numerical and analytical computations with data from laboratories and/or nature. Contents:Mathematical PreliminariesFundamentals of Fluid MechanicsLong-Crested, Linear Wave Theory (LWT)Wavemaker TheoriesNonlinear Wave TheoriesDeterministic Dynamics of Small Solid BodiesDeterministic Dynamics of Large Solid BodiesReal Ocean Waves Readership: Graduate students and practitioners in ocean and coastal engineering. Keywords:Deterministic and Nondeterministic Wave-Structure Interactions;Linear and Nonlinear Wavemaker Theories;Linear and Nonlinear Wave Theories;Fundamental Fluid Mechanics;Chaotic Analysis of Cross-Waves

Waves in Oceanic and Coastal Waters describes the observation, analysis and prediction of wind-generated waves in the open ocean, in shelf seas, and in coastal regions with islands, channels, tidal flats and inlets, estuaries, fjords and lagoons. Most of this richly illustrated book is devoted to the physical aspects of waves. After introducing observation techniques for waves, both at sea and from space, the book defines the parameters that characterise waves. Using basic statistical and physical concepts, the author discusses the prediction of waves in oceanic and coastal waters, first in terms of generalised observations, and then in terms of the more theoretical framework of the spectral energy balance. He gives the results of established theories and also the direction in which research is developing. The book ends with a description of SWAN (Simulating Waves Nearshore), the preferred computer model of the engineering community for predicting waves in coastal waters.

This book discusses the numerical simulation of water waves, which combines mathematical theories and modern techniques of numerical simulation to solve the problems associated with waves in coastal, ocean, and environmental engineering. Bridging the gap between practical mathematics and engineering, the book describes wave mechanics, establishment of mathematical wave models, modern numerical simulation techniques, and applications of numerical models in engineering. It also explores environmental issues related to water waves in coastal regions, such as pollutant and sediment transport, and introduces numerical wave flumes and wave basins. The material is self-contained, with numerous illustrations and tables, and most of the mathematical and engineering concepts are presented or derived in the text. The book is intended for researchers, graduate students and engineers in the fields of hydraulic, coastal, ocean and environmental engineering with a background in fluid mechanics and numerical simulation methods.

This book provides a comprehensive description of the latest theory-supported numerical technologies, as well as scientific and engineering applications for water surface waves. Its contents are crafted to cater to a step-by-step learning of computational wave dynamics and ocean wave modeling. It provides a comprehensive description from underlying theories of free-surface flows, to practical computational applications for coastal and ocean engineering on the basis of computational fluid dynamics (CFD). The text may be used as a textbook for advanced undergraduate students and graduate students to understand the theoretical background of wave computations, and the recent progress of computational techniques for free-surface and interfacial flows, such as Volume of Fluid (VOF), Constrained Interpolation Profile (CIP), Lagrangian Particle (SPH, MPS), Distinct Element (DEM) and Euler-Lagrange Hybrid Methods. It is also suitable for researchers and engineers who wish to apply CFD techniques to ocean modeling and practical coastal problems involving sediment transport, wave-structure interaction and surf zone flows.

For Coastal and Ocean Engineers
Basic Coastal Engineering
With Applications
An Introduction to Hydraulics of Fine Sediment Transport
Waves in Oceanic and Coastal Waters

This book treats the subject of sediment transport in the marine environment, covering transport of non-cohesive sediment by waves and current in- and outside the surf zone. It can be read independently, but a background in hydraulics and basic wave mechanics is required. It is intended for M.Sc. and Ph.D. students. The primary aim of the book is to describe the physical processes of sediment transport and how to represent them in mathematical models. It does not present a large number of different formulae for the sediment transport rates under various conditions. The book can be divided in two main parts; in the first, the relevant hydrodynamic theory is described; in the second, sediment transport and morphological development are treated. The hydrodynamic part contains a review of elementary theory for water waves, chapters on the turbulent wave boundary layer and the turbulent interaction between waves and currents, and finally, surf zone hydrodynamics and wave driven currents. The part on sediment transport introduces the basic concepts (critical bed shear stress, bed load, suspended load and sheet layer, near-bed

concentration, effect of sloping bed); it treats suspended sediment in waves and current and in the surf zone, and current and wave-generated bed forms. Finally, the modelling of cross-shore and long-shore sediment transport is described together with the development, of coastal profiles and coastlines.

This text considers classical and modern problems in linear and non-linear water-wave theory.

The increase in exploration and exploitation of ocean resources, maritime trade and ocean energy have led to development of new concepts in the study of coastal and marine structures. These developments necessitate comprehensive and in-depth knowledge of ocean wave behavior in the offshore as well as in the nearshore, such as the phenomena of wave generation, propagation, deformation and its effects, which help to enlighten our understanding of its influence on coastal and offshore structures.Ocean Wave Dynamics for Coastal and Marine Structures is a recommended textbook for students and researchers in ocean sciences, engineering and related topics. It offers application of theoretical formulae to practical relevance through problem solving. This book will also be invaluable for professionals in ports, offshore and marine industries as well as consulting companies.

Intended for coastal engineers and marine scientists who desire to develop a fundamental physical understanding of ocean waves and be able to apply this knowledge to ocean and coastal analysis and design. Provides an introduction to the physical processes of ocean wave mechanics, an understanding of the basic techniques for wave analysis, techniques for practical calculation and prediction of waves and applied wave forecasting.

Elements of Ocean Engineering

Fluid Waves

An Introduction to Hydrodynamics and Water Waves

Biology and the Mechanics of the Wave-Swept Environment

Theory and Practice

In the 20 years since publication of the first edition of this book there have been a number of significant changes in the practice of coastal engineering. This new edition has been completely rewritten to reflect these changes as well as to make other improvements to the material presented in the original text. _ Basic Coastal Engineering is an introductory text on wave mechanics and coastal processes along with the fundamentals of the practice of coa~tal engi neering. This book was written for a senior or first postgraduate course in coastal engineering. It is also suitable for self study by anyone having a basic engineering or physical science background. The level of coverage does not require a math or fluid mechanics background beyond that presented in a typical undergraduate civil or mechanical engineering curriculum. The material presented in this text is based on the author's lecture notes from a one-semester course at Virginia Pol ytechnic Institute, Texas A&M University, and George Washington University, and a senior elective course at Lehigh University. The text contains examples to demonstrate the various analysis techniques that are presented and each chapter (except the first and last) has a collection of problems for the reader to solve that further demonstrate and expand upon the text material. Chapter 1 briefly describes the coastal environment and introduces the rela tively new field of coastal engineering.

Water wave kinematics is a central field of study in ocean and coastal engineering. The wave forces on structures as well as sand erosion both on coastlines and in the ocean are to a large extent governed by the local distribution of velocities and accelerations of the water particles. Our knowledge of waves has generally been derived from measurements of the water surface elevations. The reason for this is that the surface elevations have been of primary interest and fairly cheap and reliable instruments have been developed for such measurements. The water wave kinematics has then been derived from the surface elevation information by various theories. However. the different theories for the calculation of water particle velocities and acceleration have turned out to give significant differences in the calculated responses of structures. In recent years new measurement techniques have made it possible to make accurate velocity measurements. Hence. the editors deemed it to be useful to bring together a group of experts working actively as researchers in the field of water wave kinematics. These experts included theoreticians as well as experimentalists on wave kinematics. It was also deemed useful to include experts on the response of structures to have their views from a structural engineering point of view on what information is really needed on water wave kinematics.

This book offers a timely review of wave energy and its conversion mechanisms. Written having in mind current needs of advanced undergraduates engineering students, it covers the whole process of energy generation, from waves to electricity, in a systematic and comprehensive manner. Upon a general introduction to the field of wave energy, it presents analytical calculation methods for estimating wave energy potential in any given location. Further, it covers power-take off (PTOs), describing their mechanical and electrical aspects in detail, and control systems and algorithms. The book includes chapters written by active researchers with vast experience in their respective filed of specialization. It combines basic aspects with cutting-edge research and methods, and selected case studies. The book offers systematic and practice-oriented knowledge to students, researchers, and professionals in the wave energy sector. Chapters 17 of this book is available open access under a CC BY 4.0 license at link.springer.com

This book discusses the subject of wave/current flow around a cylinder, the forces induced on the cylinder by the flow, and the vibration pattern of slender structures in a marine environment. The primary aim of the book is to describe the flow pattern and the resulting load which develops when waves or current meet a cylinder. Attention is paid to the special case of a circular cylinder. The development in the forces is related to the various flow patterns and is discussed in detail. Regular as well as irregular waves are considered, and special cases like wall proximities (pipelines) are also investigated. The book is intended for MSc students with some experience in basic fluid mechanics and for PhD students. Contents:Flow Around a Cylinder in Steady CurrentForces on a Cylinder in Steady CurrentFlow Around a Cylinder in Oscillatory FlowsForces on a Cylinder in Regular WavesMathematical and Numerical Treatment of Flow Around a CylinderDiffraction Effect. Forces on Large BodiesForces on a Cylinder in Irregular WavesFlow-Induced Vibrations of a Free Cylinder in Steady CurrentsFlow-Induced Vibrations of a Free Cylinder in WavesVibrations of Marine PipelinesMathematical Modelling of Flow-

Induced Vibrations. Readership: Civil and ocean engineers. keywords:Pipelines;Offshore Structures;Hydroelastic Vibrations;Flow-induced Vibrations;Forces on Offshore Structures;Flow Around Offshore Structures;Wave Loading;Vibrations;Waves;Steady Currents;Pipeline Stability;Diffraction;Irregular Waves;Oscillatory Flow;Mathematical Modelling;Coastal Structures;Marine Structure;Flow Loading;Vibration of Marine Pipelines "The figures are very good. Many of them are photographs and sketches of aspects of flow that are sometimes difficult to explain in words. The references are extensive, quoting many recent papers. The treatment of the subjects is up-to-date and particularly the chapters on numerical simulation and vibrations contain excellent synopses of new research, much of it by the authors themselves. The style is lucid and the text is well-organized. This book can be highly recommended to anyone who deals with cylindrical structures." Professor J W Kamphuis Coastal Engineering

Ocean Wave Mechanics

IUTAM Symposium Lisbon/Portugal 1985

Hydrodynamics of Ocean Wave-Energy Utilization

Computational Wave Dynamics

Ocean Wave Dynamics For Coastal And Marine Structures