

Applied Offshore Structural Engineering

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Maritime Technology and Engineering III - Carlos Guedes Soares 2016-12-01

Maritime Technology and Engineering 3 is a collection of papers presented at the 3rd International Conference on Maritime Technology and Engineering (MARTECH 2016, Lisbon, Portugal, 4-6 July 2016). The MARTECH Conferences series evolved from biannual national conferences in Portugal, thus reflecting the internationalization of the maritime sector. The keynote lectures and the papers, making up nearly 150 contributions, came from an international group of authors focused on different subjects in a variety of fields: Maritime Transportation, Energy Efficiency, Ships in Ports, Ship Hydrodynamics, Ship Structures, Ship Design, Ship Machinery, Shipyard Technology, safety & Reliability, Fisheries, Oil & Gas, Marine Environment, Renewable Energy and Coastal Structures. This book will appeal to academics, engineers and professionals interested or involved in these fields.

Dynamic Analysis and Design of Offshore Structures - Srinivasan Chandrasekaran 2017-10-12

This book introduces readers to various types of offshore platform geometries. It addresses the various environmental loads encountered by these structures, and provides detailed descriptions of the fundamentals of structural dynamics in a classroom style, helping readers estimate damping in offshore structures and grasp these aspects' applications in preliminary analysis and design. Basic concepts of structural dynamics are emphasized through simple illustrative examples and exercises. Design methodologies and guidelines, which are FORM based concepts, are explained through a selection of applied sample structures. Each chapter also features tutorials and exercises for self-learning. A dedicated chapter on stochastic dynamics helps students to extend the basic concepts of structural dynamics to this advanced domain of research. Hydrodynamic response of offshore structures with perforated members is one of the most recent research applications, and has proven to be one of the most effective means of retrofitting offshore structures. In addition, the book integrates the concepts of structural dynamics with the FORM-evolved design of offshore structures, offering a unique approach. This new edition is divided into seven chapters, each of which has been updated. Each chapter also includes a section on frequently asked Questions and Answers (Q&A), which enhances understanding of this complex subject through easy and self-explanatory text. Furthermore, the book presents valuable content with respect to new and recent research carried out by the author in structural dynamics. All numeric examples have been re-checked with more additional explanations. New exercises have been added to improve understanding of the subject matter. Computer coding is also included (wherever possible) to aid computer-based learning of the contents of the book. The book can serve as a textbook for senior undergraduate and graduate courses in civil, structural,

applied mechanics, mechanical, aerospace, naval architecture and ocean engineering programs. The book can also serve as a text for professional learning and development programs or as a guide for practicing and consulting offshore structural engineers. The contents of this book will be useful to graduate students, researchers, and professionals alike.

Offshore Mechatronics Systems Engineering - Hamid Reza Karimi 2018-07-04

The book gives a systematical and almost self-contained description of the many facets of envisaging, designing, implementing or experimentally exploring offshore mechatronics and systems along the adequate designs of integrated modeling, safety, control and supervision infrastructure. With the rapid improvements in offshore technologies in various fields such as oil and gas industry, wind energy, robotics and logistics, many researchers in academia and industry have focused on technology-based challenges raised in offshore environment. This book introduces novel theoretical or practical techniques for offshore mechatronics systems. Chapters cover general application model-based systems engineering, wind energy, control systems, mechanics, health monitoring, safety critical human-machine systems, logistics and offshore industrial complexes such as oil and gas operations, robotics, large space structures and autonomous underwater vehicles, and some other advanced technologies. The core feature of this book is that of establishing synergies of modeling, control, computing and mechanics in order to achieve not only robust plant system operation but also properties such as safety, cost, integrity and survivability while retaining desired performance quality. The book provides innovative insights into applications aspects and theoretical understanding of complex offshore mechatronics systems that has emerged in recent years, either via physical implementations or via extensive computer simulations in addition to sound innovated theoretical developments. It will serve as a reference for graduate and postgraduate students and for researchers in all engineering disciplines, including mechanical engineering, electrical engineering and applied mathematics to explore the state-of-the-art techniques for solving problems of integrated modeling, control and supervision of complex offshore plants with collective safety and robustness. Thus it shall be useful as a guidance for system engineering practitioners and system theoretic researchers alike.

Modern Earthquake Engineering - Junbo Jia 2016-10-01

This book addresses applications of earthquake engineering for both offshore and land-based structures. It is self-contained as a reference work and covers a wide range of topics, including topics related to engineering seismology, geotechnical earthquake engineering, structural engineering, as well as special contents dedicated to design philosophy, determination of ground motions, shock waves, tsunamis, earthquake damage, seismic response of offshore and arctic

structures, spatial varied ground motions, simplified and advanced seismic analysis methods, sudden subsidence of offshore platforms, tank liquid impacts during earthquakes, seismic resistance of non-structural elements, and various types of mitigation measures, etc. The target readership includes professionals in offshore and civil engineering, officials and regulators, as well as researchers and students in this field.

Nonlinear Analysis of Offshore Structures - Bjørn Skallerud 2002

The importance of accounting for nonlinear effects in offshore structures has increased due to their higher utilization and extended service lives. This text addresses new methods for advanced analysis of offshore structures developed during the 1990s.

Dynamic Analysis and Design of Offshore Structures - Srinivasan Chandrasekaran 2019-02-11

This book introduces readers to various types of offshore platform geometries. It addresses the various environmental loads encountered by these structures, and provides detailed descriptions of the fundamentals of structural dynamics in a classroom style, helping readers estimate damping in offshore structures and grasp these aspects' applications in preliminary analysis and design. Basic concepts of structural dynamics are emphasized through simple illustrative examples and exercises. Design methodologies and guidelines, which are FORM based concepts, are explained through a selection of applied sample structures. Each chapter also features tutorials and exercises for self-learning. A dedicated chapter on stochastic dynamics helps students to extend the basic concepts of structural dynamics to this advanced domain of research. Hydrodynamic response of offshore structures with perforated members is one of the most recent research applications, and has proven to be one of the most effective means of retrofitting offshore structures. In addition, the book integrates the concepts of structural dynamics with the FORM-evolved design of offshore structures, offering a unique approach. This new edition is divided into seven chapters, each of which has been updated. Each chapter also includes a section on frequently asked Questions and Answers (Q&A), which enhances understanding of this complex subject through easy and self-explanatory text. Furthermore, the book presents valuable content with respect to new and recent research carried out by the author in structural dynamics. All numeric examples have been re-checked with more additional explanations. New exercises have been added to improve understanding of the subject matter. Computer coding is also included (wherever possible) to aid computer-based learning of the contents of the book. The book can serve as a textbook for senior undergraduate and graduate courses in civil, structural, applied mechanics, mechanical, aerospace, naval architecture and ocean engineering programs. The book can also serve as a text for professional learning and development programs or as a guide for practicing and consulting offshore structural engineers. The contents of this book will be useful to graduate students, researchers, and professionals alike.

Integrity of Offshore Structures - D. Faulkner 2022-01-27

Papers presented at the Fourth International Symposium on Integrity of Offshore Structures, 2-3 July 1990, Kelvin Conference Centre, University of Glasgow, Scotland organized by the Department of Naval Architecture and Ocean Engineering and Mechanical Engineering.

Essentials of Offshore Structures - D.V. Reddy 2016-04-19

Essentials of Offshore Structures: Framed and Gravity Platforms examines the engineering ideas and offshore drilling platforms for exploration and production. This book offers a clear and acceptable demonstration of both

the theory and application of the relevant procedures of structural, fluid, and geotechnical mechanics to offshore structures. It

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.

Group Search Optimization for Applications in Structural Design - Lijuan Li 2011-05-27

Civil engineering structures such as buildings, bridges, stadiums, and offshore structures play an important role in our daily life. However, constructing these structures requires lots of budget. Thus, how to cost-efficiently design structures satisfying all required design constraints is an important factor to structural engineers. Traditionally, mathematical gradient-based optimal techniques have been applied to the design of optimal structures. While, many practical engineering optimal problems are very complex and hard to solve by traditional method. In the past few decades, swarm intelligence algorithms, which were inspired by the social behaviour of natural animals such as fish schooling and bird flocking, were developed because they do not require conventional mathematical assumptions and thus possess better global search abilities than the traditional optimization algorithms and have attracted more and more attention. These intelligent based algorithms are very suitable for continuous and discrete design variable problems such as ready-made structural members and have been vigorously applied to various structural design problems and obtained good results. This book gathers the authors' latest research work related with particle swarm optimizer algorithm and group search optimizer algorithm as well as their application to structural optimal design. The readers can understand the full spectrum of the algorithms and apply the algorithms to their own research problems.

Ocean Structures - Srinivasan Chandrasekaran 2017-01-06

This book addresses the concepts of material selection and analysis, choice of structural form, construction methods, environmental loads, health monitoring, non-destructive testing, and repair methodologies and rehabilitation of ocean structures. It examines various types of ocean and offshore structures, including drilling platforms, processing platforms and vessels, towers, sea walls and surge barriers, and more. It also explores the use of MEMS in offshore structures, with regard to military and oil exploration applications. Full-color figures as well as numerous solved problems and examples are included to help readers understand the applied concepts.

Recent Advances in Structural Engineering, Volume 1 - A. Rama Mohan Rao 2018-08-01

This book is a collection of select papers presented at the Tenth Structural Engineering Convention 2016 (SEC-2016). It comprises plenary, invited, and contributory papers covering numerous applications from a wide spectrum of areas related to structural engineering. It presents contributions by academics, researchers, and practicing structural engineers addressing analysis and design of concrete and steel structures, computational structural mechanics, new building materials for sustainable construction, mitigation of structures against natural hazards, structural health monitoring, wind and earthquake engineering, vibration control and smart structures, condition assessment and performance evaluation, repair, rehabilitation and retrofit of structures. Also covering advances in construction techniques/ practices, behavior of structures under blast/impact loading, fatigue and fracture, composite materials and structures, and structures for non-conventional energy (wind and solar), it will serve as a valuable resource for researchers,

students and practicing engineers alike.

Dynamics of Fixed Marine Structures - N. D. P. Barltrop
2013-10-22

Dynamics of Fixed Marine Structures, Third Edition proves guidance on the dynamic design of fixed structures subject to wave and current action. The text is an update of the "UR8" design guide "Dynamics of Marine Structures" with discussion of foundations, wind turbulence, offshore installations, earthquakes, and strength and fatigue. The book employs analytical methods of static and dynamic structural analysis techniques, particularly the statistical and spectral methods when applied to loading and in the calculating dynamic responses. The statistical methods are explained when used to wave, wind, and earthquake calculations, together with the problems encountered in actual applications. Of importance to fixed offshore platforms are the soil properties and foundation covering soil behavior, site investigation, testing, seabed stability, gravity structures, and the use of single piles. Methods of forecasting, measuring, and modeling of waves and currents are also presented in offshore structure construction. Basic hydrodynamics is explained in understanding wave theory, and some description is given to forecasting of environmental conditions that will affect the structures. The effects of vortex-induced vibrations on the structure are explained, and the three methods that can prevent vortex-induced oscillations are given. Wind turbulence or wind loads are analyzed against short natural period or long natural periods of structures. The transportation of offshore platforms, installation, and pile driving, including examples of the applications found in the book, are given as well. The guide is helpful for offshore engineers, designers of inshore jetties, clients needing design and analysis work, specialists related to offshore structural engineering, and students in offshore engineering.

Concrete Construction Engineering Handbook - Edward G. Nawy 2008-06-24

The first edition of this comprehensive work quickly filled the need for an in-depth handbook on concrete construction engineering and technology. Living up to the standard set by its bestselling predecessor, this second edition of the Concrete Construction Engineering Handbook covers the entire range of issues pertaining to the construction

Advanced Materials and Structural Engineering - Jong Wan Hu 2016-02-03

The ICAMEST 2015 Conference covered new developments in advanced materials and engineering structural technology. Applications in civil, mechanical, industrial and material science are covered in this book. Providing high-quality, scholarly research, addressing developments, applications and implications in the field of structural health monitoring, construction safety and management, sensors and measurements. This volume contains new models for nonlinear structural analysis and applications of modeling identification. Furthermore, advanced chemical materials are discussed with applications in mechanical and civil engineering and for the maintenance of new materials. In addition, a new system of pressure regulating and water conveyance based on small and middle hydropower stations is discussed. An experimental investigation of the ultimate strength and behavior of the three types of steel tubular K-joints was presented. Furthermore, real-time and frequency linear and nonlinear modeling performance of materials of structures contents were concluded with the notion of a fully brittle material, and this approach is implemented in the book by outlining a finite-element method for the prediction of the construction performance and cracking patterns of arbitrary structural concrete forms. This book is an ideal reference for practicing engineers in material, mechanical and civil engineering and

consultants (design, construction, maintenance), and can also be used as a reference for students in mechanical and civil engineering courses.

Applied Mechanics Reviews - 1970

Design Aids of Offshore Structures Under Special Environmental Loads including Fire Resistance - Srinivasan Chandrasekaran 2018-01-12

This book provides detailed analysis methods and design guidelines for fire resistance, a vital consideration for offshore processing and production platforms. Recent advancements in the selection of various geometric structural forms for deep-water oil exploration and production require a detailed understanding of the design of offshore structures under special loads. Focusing on a relatively new aspect of offshore engineering, the book offers essential teaching material, illustrating and explaining the concepts discussed through many tutorials. It creates a basis for designing new courses for students of ocean engineering and naval architecture, civil engineering, and applied mechanics at both undergraduate and graduate levels. As such, its content can be used for self-study or as a text in structured courses and professional development programs.

Handbook of Coastal and Ocean Engineering: Offshore structures, marine foundations, sediment processes, and modeling - John B. Herbich 1990

Applied Offshore Structural Engineering - Teng H. Hsu 1984

Dynamics of Offshore Structures - Mino H Patel 2013-10-22

Dynamics of Offshore Structures provides an integrated treatment of the main subject areas that contribute to the design, construction, installation, and operation of fixed and floating offshore structures. The book begins with an overview of offshore oil and gas development and offshore structures. Separate chapters follow on the ocean environment; basic fluid mechanics; gravity wave theories; fluid loading on offshore structures; hydrostatics and dynamic response of floating bodies; and model testing of offshore structures. This book is prepared with particular emphasis on the fundamentals of oceanography, basic fluid mechanics, wave theory, hydrodynamics, naval architecture, and structural analysis to meet the needs of students reading ocean engineering or naval architecture, at both undergraduate and postgraduate levels. Basic equations and theoretical results are derived in a rigorous manner but sections on model testing, full-scale measurements, design, and certification are also included to ensure that the book is of value to professional engineers seeking a balanced treatment of fundamental and practical issues.

Dynamics of Offshore Structures - James F. Wilson 2003-01-03

Unique, cutting-edge material on structural dynamics and natural forces for offshore structures Using the latest advances in theory and practice, *Dynamics of Offshore Structures*, Second Edition is extensively revised to cover all aspects of the physical forces, structural modeling, and mathematical methods necessary to effectively analyze the dynamic behavior of offshore structures. Both closed-form solutions and the Mathematica(r) software package are used in many of the up-to-date example problems to compute the deterministic and stochastic structural responses for such offshore structures as buoys; moored ships; and fixed-bottom, cable-stayed, and gravity-type platforms. Throughout the book, consideration is given to the many assumptions involved in formulating a structural model and to the natural forces encountered in the offshore environment. These analyses focus on plane motions of elastic structures with linear and nonlinear restraints, as well

as motions induced by the forces of currents, winds, earthquakes, and waves, including the latest theories and information on wave mechanics. Topics addressed include multidegree of freedom linear structures, continuous system analysis (including the motion of cables and pipelines), submerged pile design, structural modal damping, fluid-structure-soil interactions, and single degree of freedom structural models that, together with plane wave loading theories, lead to deterministic or time history predictions of structural responses. These analyses are extended to statistical descriptions of both wave loading and structural motion. Dynamics of Offshore Structures, Second Edition is a valuable text for students in civil and mechanical engineering programs and an indispensable resource for structural, geotechnical, and construction engineers working with offshore projects.

Asset Integrity Management for Offshore and Onshore Structures - Mohamed El-Reedy 2022-05-19

Oil and gas assets are under constant pressure and engineers and managers need integrity management training and strategies to ensure their operations are safe. Gaining practical guidance is not trained ahead of time and learned on the job. Asset Integrity Management of Offshore and Onshore Structures delivers a critical training tool for engineers to prepare and mitigate safety risk. Starting with a transitional introductory chapter, the reference dives into integrity management approaches including codes and standards. Inspection, assessment, and repair methods are covered for offshore, FPSO, onshore and pipelines. Suggested proactive approaches and modeling risk-based inspection are also included. Supported with case studies, detailed discussions, and practical applications, Asset Integrity Management of Offshore and Onshore Structures gives oil and gas managers a reference to extend asset life, reduce costs, and minimize impact to personnel and environment. Bridge between the theory of integrity management into oil and gas application Understand the strategies and techniques to mitigate corrosion affect, assessment, inspection, and repairs from real-world examples Manage a variety of assets including offshore, subsea, pipelines, and onshore

Offshore Structural Engineering - Srinivasan Chandrasekaran 2017-12-19

Successfully estimate risk and reliability, and produce innovative, yet reliable designs using the approaches outlined in Offshore Structural Engineering: Reliability and Risk Assessment. A hands-on guide for practicing professionals, this book covers the reliability of offshore structures with an emphasis on the safety and reliability of offshore facilities during analysis, design, inspection, and planning. Since risk assessment and reliability estimates are often based on probability, the author utilizes concepts of probability and statistical analysis to address the risks and uncertainties involved in design. He explains the concepts with clear illustrations and tutorials, provides a chapter on probability theory, and covers various stages of the process that include data collection, analysis, design and construction, and commissioning. In addition, the author discusses advances in geometric structural forms for deep-water oil exploration, the rational treatment of uncertainties in structural engineering, and the safety and serviceability of civil engineering and other offshore structures. An invaluable guide to innovative and reliable structural design, this book: Defines the structural reliability theory Explains the reliability analysis of structures Examines the reliability of offshore structures Describes the probabilistic distribution for important loading variables Includes methods of reliability analysis Addresses risk assessment and more Offshore Structural Engineering: Reliability and Risk Assessment provides an in-depth

analysis of risk analysis and assessment and highlights important aspects of offshore structural reliability. The book serves as a practical reference to engineers and students involved in naval architecture, ocean engineering, civil/structural, and petroleum engineering.

Developments in Maritime Transportation and Exploitation of Sea Resources - Carlos Guedes Soares 2013-10-07

Developments in Maritime Transportation and Exploitation of Sea Resources covers recent developments in maritime transportation and exploitation of sea resources, encompassing ocean and coastal areas. The book brings together a selection of papers reflecting fundamental areas of recent research and development in the fields of:- Ship Hydrodynamics-

Marine Structural Design - Yong Bai 2015-09-18

Marine Structural Design, Second Edition, is a wide-ranging, practical guide to marine structural analysis and design, describing in detail the application of modern structural engineering principles to marine and offshore structures. Organized in five parts, the book covers basic structural design principles, strength, fatigue and fracture, and reliability and risk assessment, providing all the knowledge needed for limit-state design and re-assessment of existing structures. Updates to this edition include new chapters on structural health monitoring and risk-based decision-making, arctic marine structural development, and the addition of new LNG ship topics, including composite materials and structures, uncertainty analysis, and green ship concepts. Provides the structural design principles, background theory, and know-how needed for marine and offshore structural design by analysis Covers strength, fatigue and fracture, reliability, and risk assessment together in one resource, emphasizing practical considerations and applications Updates to this edition include new chapters on structural health monitoring and risk-based decision making, and new content on arctic marine structural design

Nonlinear Stochastic Mechanics - Nicola Bellomo 2012-12-06

The Symposium, held in Torino (LSI, Villa Gualino) July 1-5, 1991 is the sixth of a series of IUTAM-Symposia on the application of stochastic analysis to continuum and discrete mechanics. The previous one, held in Innsbruck (1987), was mainly concentrated on qualitative and quantitative analysis of stochastic dynamical systems as well as on bifurcation and transition to chaos of deterministic systems. This Symposium concentrated on fundamental aspects (stochastic analysis and mathematical methods), on specific applications in various branches of mechanics, engineering and applied sciences as well as on related fields as analysis of large systems, system identification, earthquake prediction. Numerical methods suitable to provide quantitative results, say stochastic finite elements, approximation of probability distribution and direct integration of differential equations have also been the object of interesting presentations. Specific topics of the sessions have been: Engineering Applications, Equivalent Linearization of Discrete Stochastic Systems, Fatigue and Life Estimation, Fluid Dynamics, Numerical Methods, Random Vibration, Reliability Analysis, Stochastic Differential Equations, System Identification, Stochastic Control. We are indebted to the IUTAM Bureau for having promoted and sponsored this Symposium and the Scientific Committee for having collaborated to the selection of participants and lecturers as well as to a prompt reviewing of the papers submitted for publication into these proceedings. A special thank is due to Frank Kozin: the organization of this meeting was for him 'very important; he missed the meeting but his organizer ability was present.

Condition Assessment of Aged Structures - J K Paik 2014-01-23

Any structural system in service is subject to age-related deterioration, leading to potential concerns regarding maintenance, health & safety, environmental and economic implications. Condition assessment of aged structures is an invaluable, single source of information on structural assessment techniques for marine and land-based structures such as ships, offshore installations, industrial plant and buildings. Topics covered include: - Current practices and standards for structural condition assessment - Fundamental mechanisms and advanced mathematical methods for predicting structural deterioration - Residual strength assessment of deteriorated structures - Inspection and maintenance of aged structures - Reliability and risk assessment of aged structures Professionals from a broad range of disciplines will be able to gain a better understanding of current practices and standards for structural condition assessment or health monitoring, and what future trends might be. Single source of information on structural assessment techniques for marine and land-based structures Examines the residual strength and reliability of aged structures Assesses current practices covering inspection, health monitoring and maintenance

Probabilistic Structural Mechanics Handbook - C.R. Sundararajan 2012-12-06

The need for a comprehensive book on probabilistic structural mechanics that brings together the many analytical and computational methods developed over the years and their applications in a wide spectrum of industries-from residential buildings to nuclear power plants, from bridges to pressure vessels, from steel structures to ceramic structures-became evident from the many discussions the editor had with practising engineers, researchers and professors. Because no single individual has the expertise to write a book with such a diverse scope, a group of 39 authors from universities, research laboratories, and industries from six countries in three continents was invited to write 30 chapters covering the various aspects of probabilistic structural mechanics. The editor and the authors believe that this handbook will serve as a reference text to practicing engineers, teachers, students and researchers. It may also be used as a textbook for graduate-level courses in probabilistic structural mechanics. The editor wishes to thank the chapter authors for their contributions. This handbook would not have been a reality without their collaboration.

Advanced Marine Structures - Srinivasan Chandrasekaran 2015-08-18

Due in part to a growing demand for offshore oil and gas exploration, the development of marine structures that initially started onshore is now moving into deeper offshore areas. Designers are discovering a need to revisit basic concepts as they anticipate the response behavior of marine structures to increased water depths. Providing a simplified approach to the subject, *Advanced Marine Structures* explains the fundamentals and advanced concepts of marine architecture introduces various types of offshore platforms, and outlines the different stages of marine structure analysis and design. Written from a structural engineering perspective, this book focuses on structures constructed for offshore oil and gas exploration, various environmental loads, ultimate load design, fluid-structure interaction, fatigue, and fracture. It also offers detailed descriptions of different types of structural forms, functions and limitations of offshore platforms and explains how different loads act on each. In addition, the text incorporates examples and application problems to illustrate the use of experimental, numerical, and analytical studies in the design and development of marine structures, and reviews relevant literature on wave interaction and porous cylinders. This book: Focuses on structural reliability Deliberates on

fracture and fatigue and examines their application in marine structures Introduces ideas on the retrofit and renovation of marine structures Examines the strength analysis of offshore structures and structural members *Advanced Marine Structures* examines the design of offshore structures from a structural engineering perspective and explains the design methodologies and guidelines needed for the progressive conceptualization and design of advanced marine structures.

Handbook of Offshore Engineering (2-volume Set) - Subrata Chakrabarti 2005-08-19

* Each chapter is written by one or more invited world-renowned experts * Information provided in handy reference tables and design charts * Numerous examples demonstrate how the theory outlined in the book is applied in the design of structures Tremendous strides have been made in the last decades in the advancement of offshore exploration and production of minerals. This book fills the need for a practical reference work for the state-of-the-art in offshore engineering. All the basic background material and its application in offshore engineering is covered. Particular emphasis is placed in the application of the theory to practical problems. It includes the practical aspects of the offshore structures with handy design guides, simple description of the various components of the offshore engineering and their functions. The primary purpose of the book is to provide the important practical aspects of offshore engineering without going into the nitty-gritty of the actual detailed design. · Provides all the important practical aspects of ocean engineering without going into the 'nitty-gritty' of actual design details. · Simple to use - with handy design guides, references tables and charts. · Numerous examples demonstrate how theory is applied in the design of structures

Structural Engineering and Applied Mechanics Data Handbook, Volume 3 - Teng H Hsu 1988

This volume discusses elasticity, compatibility, equilibrium, and boundary conditions relative to the stresses and strains that plates undergo.

Offshore Structures Engineering - Fernando Luiz Lobo Carneiro 1979

Design Aids of Offshore Structures Under Special Environmental Loads including Fire Resistance -

Srinivasan Chandrasekaran 2018-01-22

This book provides detailed analysis methods and design guidelines for fire resistance, a vital consideration for offshore processing and production platforms. Recent advancements in the selection of various geometric structural forms for deep-water oil exploration and production require a detailed understanding of the design of offshore structures under special loads. Focusing on a relatively new aspect of offshore engineering, the book offers essential teaching material, illustrating and explaining the concepts discussed through many tutorials. It creates a basis for designing new courses for students of ocean engineering and naval architecture, civil engineering, and applied mechanics at both undergraduate and graduate levels. As such, its content can be used for self-study or as a text in structured courses and professional development programs.

Modeling and Simulation Techniques in Structural Engineering - Samui, Pijush 2016-08-12

The development of new and effective analytical and numerical models is essential to understanding the performance of a variety of structures. As computational methods continue to advance, so too do their applications in structural performance modeling and analysis. *Modeling and Simulation Techniques in Structural Engineering* presents emerging research on computational techniques and applications within the field of structural engineering. This timely publication features practical applications as well as new research

insights and is ideally designed for use by engineers, IT professionals, researchers, and graduate-level students.

Developments in the Collision and Grounding of Ships and Offshore Structures - Carlos Guedes Soares 2019-10-11

Developments in the Collision and Grounding of Ships and Offshore includes the contributions to the 8th International Conference on Collision and Grounding of Ships and Offshore Structures (ICCGS 2019, Lisbon, Portugal, 21-23 October 2019). The series of ICCGS-conferences started in 1996 in San Francisco, USA, and are organised every three years in Europe, Asia and the Americas. Developments in the Collision and Grounding of Ships and Offshore covers a wide range of topics, from the behavior of large passenger vessels in collision and grounding, collision and grounding in arctic conditions including accidental ice impact, stability residual strength and oil outflow of ships after collision or grounding, collision and grounding statistics and predictions and measures of the probability of incidents, risk assessment of collision and grounding, prediction and measures for reduction of collision and grounding, new designs for improvement of structural resistance to collisions, analysis of ultimate strength of ship structures (bulkheads, tank tops, shell etc.), design of buffer bows to reduce collision consequences, design of foreship structures of ferries with doors to avoid water ingress in case of a collision, development of rational rules for the structural design against collision and grounding, innovative navigation systems for safer sea transportation, the role of IMO, classification societies, and other regulatory bodies in developing safer ships, collision between ships and offshore structures, collision between ships and fixed or floating bridges and submerged tunnels, collision with quays and waterfront structures, collision and grounding experiments, properties of marine-use materials under impact loadings, residual strength of damaged ships and offshore structures, analysis of ultimate strength of ship structures, to human factors in collision and grounding accidents. Developments in the Collision and Grounding of Ships and Offshore is a valuable resource for academics, engineers and professionals involved in these areas.

Offshore Structures - Mohamed A. El-Reedy 2012-08-21

With most of the easy gas and oil reserves discovered and prices rebounding, companies are now drilling far offshore in extreme weather condition environments. As deepwater wells are drilled to greater depths, engineers and designers are confronted with new problems such as water depth, weather conditions, ocean currents, equipment reliability, and well accessibility. Offshore Structure Design, Construction and Maintenance covers all types of offshore structures and platforms employed worldwide. The ultimate reference for selecting, operating and maintaining offshore structures, this book provides a road map for designing structures which will stand up even in the harshest environments. The selection of the proper type of offshore structure is discussed from a technical and economic point of view. The design procedure for the fixed offshore structure will be presented and how to review the design to reach the optimum solution. Nonlinear analysis (Push over) analysis will be presented as a new technique to design and assess the existing structure. Pile design and tubular joint with the effect of fatigue loading will be presented also from a theoretical and a practical point of view. With this book in hand, engineers receive the most up-to-date methods for performing a structural life cycle analysis; implement maintenance plans for topsides and jackets, using non destructive testing. Under water inspection is discussed for hundreds of platforms in detail. Advanced repair methodology for scour, marine growth and damaged or deteriorating members are discussed. Risk based under water inspection techniques

are covered from a practical point of view. In addition, the book will be supported by an online modeling and simulation program which will allow designers to save time and money by verifying assumptions online. One stop guide to offshore structure design and analysis Easy to understand methods for structural life cycle analysis Expert advice for designing offshore platforms for all types of environments Save time and money by verifying designs online

Current Perspectives and New Directions in Mechanics, Modelling and Design of Structural Systems - Alphose Zingoni 2022-09-02

Current Perspectives and New Directions in Mechanics, Modelling and Design of Structural Systems comprises 330 papers that were presented at the Eighth International Conference on Structural Engineering, Mechanics and Computation (SEMC 2022, Cape Town, South Africa, 5-7 September 2022). The topics featured may be clustered into six broad categories that span the themes of mechanics, modelling and engineering design: (i) mechanics of materials (elasticity, plasticity, porous media, fracture, fatigue, damage, delamination, viscosity, creep, shrinkage, etc); (ii) mechanics of structures (dynamics, vibration, seismic response, soil-structure interaction, fluid-structure interaction, response to blast and impact, response to fire, structural stability, buckling, collapse behaviour); (iii) numerical modelling and experimental testing (numerical methods, simulation techniques, multi-scale modelling, computational modelling, laboratory testing, field testing, experimental measurements); (iv) design in traditional engineering materials (steel, concrete, steel-concrete composite, aluminium, masonry, timber); (v) innovative concepts, sustainable engineering and special structures (nanostructures, adaptive structures, smart structures, composite structures, glass structures, bio-inspired structures, shells, membranes, space structures, lightweight structures, etc); (vi) the engineering process and life-cycle considerations (conceptualisation, planning, analysis, design, optimization, construction, assembly, manufacture, maintenance, monitoring, assessment, repair, strengthening, retrofitting, decommissioning). Two versions of the papers are available: full papers of length 6 pages are included in the e-book, while short papers of length 2 pages, intended to be concise but self-contained summaries of the full papers, are in the printed book. This work will be of interest to civil, structural, mechanical, marine and aerospace engineers, as well as planners and architects.

Structural, Environmental, Coastal and Offshore Engineering - Abd Nasir B. Matori 2014-06-06

Collection of selected, peer reviewed papers from the 2nd International Conference on Civil, Offshore and Environmental Engineering, June 3-5, 2014, Kuala Lumpur, Malaysia. The 128 papers are grouped as follows: Chapter 1: Environmental and Water Resources Engineering, Chapter 2: Coastal and Offshore Engineering, Chapter 3: Structures and Materials, Chapter 4: Construction and Project Management, Chapter 5: Building, Highway, Geotechnical, Transportation Engineering and Geoinformatics

Decisions Under Uncertainty - Ian Jordaan 2005-04-07
Publisher Description

Offshore Mechanics - Madjid Karimirad 2018-01-30

Covers theoretical concepts in offshore mechanics with consideration to new applications, including offshore wind farms, ocean energy devices, aquaculture, floating bridges, and submerged tunnels This comprehensive book covers important aspects of the required analysis and design of offshore structures and systems and the fundamental background material for offshore engineering. Whereas most of the books currently available in the field use traditional oil, gas, and ship industry examples in order to explain the

fundamentals in offshore mechanics, this book uses more recent applications, including recent fixed-bottom and floating offshore platforms, ocean energy structures and systems such as wind turbines, wave energy converters, tidal turbines and hybrid marine platforms. Offshore Mechanics covers traditional and more recent methodologies used in offshore structure modelling (including SPH and hydroelasticity models). It also examines numerical techniques, including computational fluid dynamics and finite element method. Additionally, the book features easy-to-understand exercises and examples. Provides a comprehensive treatment for the case of recent applications in offshore mechanics for

researchers and engineers Presents the subject of computational fluid dynamics (CFD) and finite element methods (FEM) along with the high fidelity numerical analysis of recent applications in offshore mechanics Offers insight into the philosophy and power of numerical simulations and an understanding of the mathematical nature of the fluid and structural dynamics with focus on offshore mechanic applications Offshore Mechanics: Structural and Fluid Dynamics for Recent Applications is an important book for graduate and senior undergraduate students in offshore engineering and for offshore engineers and researchers in the offshore industry.