
An Introduction On Offshore Engineering And Technology

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Engineering Challenges for Sustainable Future Elsevier

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.

Design, Fabrication, Installation CRC Press

Offshore platforms face many risks, including a hostile ocean environment, extreme temperatures, overpressure loads, fire risks, and hydrocarbon explosions, all of which pose unique challenges in designing their topside platforms. The topside design also involves the selection of appropriate materials to reduce fire risk without compromising the functional requirements. These platforms serve valuable, utility, production, and processing purposes, and can also provide living quarters for personnel. Concepts such as basic design, special design, materials selection, and risk hazards are explained in the authors' straightforward classroom style, and are based on their rich experience in both academia and industry. Features

- Includes

- practical examples which are solved using international codes to offer a better understanding of the subjects presented
- Addresses safety and risk of offshore platforms, and considers numerous topside accident scenarios
- Discusses the structural and mechanical properties of various materials, such as steel and newer functionally graded materials (FGMs)

Design Aids for Offshore Topside Platforms Under Special Loads serves as a design manual for multi-disciplinary engineering graduates and practicing professionals working in civil, mechanical, offshore, naval, and petroleum engineering fields. In addition, the book will serve as reference manual for practicing design engineers and risk assessors.

Proceedings of the 3rd International Conference on Civil, Offshore and Environmental Engineering (ICCOEE 2016, Malaysia, 15-17 Aug 2016) Springer

There is an increasing need to construct engineering structures in the Arctic seas. The requirement is principally generated by the oil and gas industry, because of the substantial reserves that are known to exist offshore in the Beaufort Sea, the Caspian Sea, the Barents Sea, the Pacific Ocean off the coast of Sakhalin, the Canadian Arctic, and almost certainly elsewhere. Structures have to withstand the severe environmental forces generated by sea ice, a subject that is developing rapidly but is still far from completely understood. Underwater pipelines have to be safe against ice gouging and strudel scour, but also have to be constructed safely and economically. The social and human environment has to be understood

and respected. This important book intentionally takes a broad view, and vividly accounts for the many and often subtle interactions between the different factors. It is illustrated by case studies of actual projects.

Construction of Prestressed Concrete Structures CRC Press

This encyclopedia adopts a wider definition for the concept of ocean engineering. Specifically, it includes (1) offshore engineering: fixed and floating offshore oil and gas platforms; pipelines and risers; cables and moorings; buoy technology; foundation engineering; ocean mining; marine and offshore renewable energy; aquaculture engineering; and subsea engineering; (2) naval architecture: ship and special marine vehicle design; intact and damaged stability; technology for energy efficiency and green shipping; ship production technology; decommissioning and recycling; (3) polar and Arctic Engineering: ice mechanics; ice-structure interaction; polar operations; polar design; environmental protection; (4) underwater technologies: AUV/ROV design; AUV/ROV hydrodynamics; maneuvering and control; and underwater-specific communicating and sensing systems for AUV/ROVs. It summarizes the A–Z of the background and application knowledge of ocean engineering for use by ocean scientists and ocean engineers as well as nonspecialists such as engineers and scientists from all disciplines, economists, students, and politicians. Ocean engineering theories, ocean devices and equipment, ocean design and operation technologies are described by

international experts, many from industry and each entry offers an introduction and references for further study, making current technology and operating practices available for future generations to learn from. The book also furthers our understanding of the current state of the art, leading to new and more efficient technologies with breakthroughs from new theory and materials. As the land resources approach the exploitation limit, ocean resources are becoming the next choice for the sustainable development. As such, ocean engineering is vital in the 21st century.

Introduction to Marine Engineering CRC Press

The mooring system is a vital component of various floating facilities in the oil, gas, and renewables industries. However, there is a lack of comprehensive technical books dedicated to the subject. *Mooring System Engineering for Offshore Structures* is the first book delivering in-depth knowledge on all aspects of mooring systems, from design and analysis to installation, operation, maintenance and integrity management. The book gives beginners a solid look at the fundamentals involved during mooring designs with coverage on current standards and codes, mooring analysis and theories behind the analysis techniques. Advanced engineers can stay up-to-date through operation, integrity management, and practical examples provided. This book is recommended for students majoring in naval architecture, marine or ocean engineering, and allied disciplines in civil or mechanical engineering. Engineers and researchers in the offshore industry will benefit from the knowledge presented to understand the various types of mooring systems, their design, analysis, and operations. Understand the various types of mooring systems and the theories behind mooring analysis Gain practical experience and lessons learned from worldwide case studies Combine engineering fundamentals with practical applications to solve today's offshore challenges

Design Aids of Offshore Structures Under Special Environmental Loads

including Fire Resistance Springer

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

Marine Structural Design Calculations Springer Nature

Subsea production systems, overview of subsea engineering, subsea field development, subsea distribution system. Flow assurance and system engineering. Subsea structure and equipment. Subsea umbilical, risers and flowlines.

Springer Handbook of Ocean Engineering Springer Science & Business Media

Practical Engineering Management of Offshore Oil and Gas Platforms delivers the first must-have content to the multiple engineering managers and clients devoted to the design, equipment, and operations of offshore oil and gas platforms. Concepts explaining how to interact with the various task forces, getting through bid proposals, and how to maintain project control are all covered in the necessary training reference. Relevant equipment and rule of thumb techniques to calculate critical features on the design of the platform are also covered, including tank capacities and motor power, along with how to consistently change water, oil, and gas production profiles over the course of a project. The book helps offshore oil and gas operators and engineers gain practical understanding of the multiple disciplines involved in offshore oil and gas projects using experience-based approaches and lessons learned. Delivers the first ever must-have content to the multiple engineering managers and clients devoted to the design, equipment, and operations of offshore oil and gas platforms Contains rules of thumb techniques to calculate critical features on the design of the platform Includes practical checklists for project estimates and cost evaluation for effective project execution in budgeting and scheduling Helps offshore oil and gas operators and engineers gain practical understanding of the multiple disciplines involved in offshore oil and gas projects using experience-based approaches

and lessons learned

Marine Technology and Operations Wiley

This book provides a comprehensive understanding of each aspect of offshore operations including conventional methods of operations, emerging technologies, legislations, health, safety and environment impact of offshore operations. The book starts by coverage of notable offshore fields across the globe and the statistics of present oil production, covering all types of platforms available along with their structural details. Further, it discusses production, storage and transportation, production equipment, safety systems, automation, storage facilities and transportation. Book ends with common legislation acts and comparison of different legislation acts of major oil/gas producing nations. The book is aimed at professionals and researchers in petroleum engineering, offshore technology, subsea engineering, and Explores the engineering, technology, system, environmental, operational and legislation aspects of offshore productions systems Covers most of the subsea engineering material in a concise manner Includes legislation of major oil and gas producing nations pertaining to offshore operations (oil and gas) Incorporates case studies of major offshore operations (oil and gas) accidents and lessons learnt Discusses environment impact of offshore operations

Specialized applications WIT Press

Offshore Engineering continues to develop and expand rapidly. While in the public eye its focus has shifted towards subsea and floating developments in ever deeper waters, bottom founded structures are still at the industry ' s heart. The fixed structure

remains its dependable workhorse and even today newly installed fixed structures far outnumber subsea and floating applications. Additionally, the knowledge and technology that have (literally) pushed the boundaries of Offshore Engineering into ever more demanding environments and water depths have been largely pioneered by bottom founded structures. An engineer's central skill is to develop coherent and balanced models for the problems encountered. Regrettably, due to availability of ever more sophisticated computer applications this expertise is at risk of getting lost, and adopting computer outcomes without truly understanding the models and their limitations is naive, risky and unprofessional. Therefore, every engineer needs fundamental knowledge and understanding of underlying theories and technologies. This Handbook is intended to help offshore engineers acquire and sustain relevant expertise in some notoriously difficult subjects. It attempts to stimulate reflection and critical evaluation of the models used and the strengths and weaknesses of the solutions found. While dealing more specifically with bottom founded structures, the material is generally applicable to offshore structures of all types. The Handbook can be used as a textbook for Master's students and as a manual and reference guide for practising professionals.

Integrity of Offshore Structures Butterworth-Heinemann

With activity in the engineering of offshore structures increasing around the world, this title offers an introduction to many of the core design and assessment skills required of those working in the sector, in accordance with the latest codes and standards.

Encyclopedia of Maritime and Offshore Engineering John Wiley & Sons
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.

Theory & Practice CRC Press

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.

Underwater Repair Technology CRC Press

As a method of joining with economic, performance-related and environmental advantages over traditional welding in some applications, adhesive bonding of joints in the marine environment is increasingly gaining popularity. Adhesives in marine engineering provides an invaluable overview of the design and use of adhesively-bonded joints in this challenging environment. After an introduction to the use of adhesives in marine and offshore engineering, part one focuses on adhesive solution design and analysis. The process of selecting adhesives for marine environments is explored, followed by chapters discussing the specific design of adhesively-bonded joints for ship applications and wind turbines. Predicting the failure of bonded structural joints in marine engineering is also considered. Part two reviews testing the mechanical, thermal and chemical properties of adhesives for marine environments together with the moisture resistance and durability of adhesives for marine environments. With its distinguished editor and international team of expert contributors, Adhesives in marine engineering is an essential guide for all those involved in the design, production and maintenance of bonded structures in the marine environment, as well as proving a key source for academic researchers in the field. Provides an invaluable overview of the design and use of

adhesively-bonded joints in marine environments Discusses the use of adhesives in marine and offshore engineering, adhesive solution design and analysis, and the design of adhesively-bonded joints for ship applications and wind turbines, among other topics Reviews testing the mechanical, thermal and chemical properties of adhesives for marine environments, together with the moisture resistance and durability of these adhesives

Introduction to Permanent Plug and Abandonment of Wells Gulf Professional Publishing

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.

Marine Structures Engineering: Specialized Applications

Introduction to Marine Engineering

* 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

Principles and Practice Thomas Telford Services Limited

This open access book offers a timely guide to challenges and current
practices to permanently plug and abandon hydrocarbon wells. With a
focus on offshore North Sea, it analyzes the process of plug and
abandonment of hydrocarbon wells through the establishment of
permanent well barriers. It provides the reader with extensive
knowledge on the type of barriers, their functioning and verification. It
then discusses plug and abandonment methodologies, analyzing
different types of permanent plugging materials. Last, it describes some
tests for verifying the integrity and functionality of installed permanent
barriers. The book offers a comprehensive reference guide to well
plugging and abandonment (P & A) and well integrity testing. The
book also presents new technologies that have been proposed to be
used in plugging and abandoning of wells, which might be game-
changing technologies, but they are still in laboratory or testing level.
Given its scope, it addresses students and researchers in both academia
and industry. It also provides information for engineers who work in
petroleum industry and should be familiarized with P & A of
hydrocarbon wells to reduce the time of P & A by considering it during
well planning and construction.

An Introduction John Wiley & Sons

Introduction to Marine Engineering Elsevier

An Introduction CRC Press

Methods and practices for constructing sophisticated prestressed concrete
structures. Construction of Prestressed Concrete Structures, Second
Edition, provides the engineer or construction contractor with a
complete guide to the design and construction of modern, high-
quality concrete structures. This highly practicable new edition of Ben

C. Gerwick's classic guide is expanded and almost entirely rewritten to reflect the dramatic developments in materials and techniques that have occurred over the past two decades. The first of the book's two sections deals with materials and techniques for prestressed concrete, including the latest recipes for high-strength and durable concrete mixes, new reinforcing materials and their placement patterns, modern prestressing systems, and special techniques such as lightweight concrete and composite construction. The second section covers application to buildings; bridges; pilings; and marine structures, including offshore platforms, floating structures, tanks, and containments. Special subjects such as cracking and corrosion, repair and strengthening of existing structures, and construction in remote areas are presented in the final chapters. For engineers and construction contractors involved in any type of prestressed concrete construction, this book enables the effective implementation of advanced structural concepts and their economical and reliable translation into practice.

Dynamic Analysis of Offshore Structures World Scientific

"This book uses academic content and rigor to introduce all relevant topics, from global wind resource and historical background, through to modern electricity generation and distribution, including the topical subject area of offshore systems"--