Design Reliability Fundamentals And Applications

An Insightful Guide to Avoiding Offshore Oil- and Gas-Industry Disaster Designing, constructing, operating, and maintaining offshore oil and gas industry equipment and systems can sometimes result in accidents, injuries, and other serious problems. Safety and Reliability in the Oil and Gas Industry: A Practical Approach focuses on oil and gas industry equipment reliability, offers useful and up-to-date information on the subject, and covers in a single volume the most common safety and reliability engineering issues in the oil and gas industry. The book introduces the latest developments in the area, and provides relevant methods and approaches. It also presents important aspects of various case studies on major accidents in the oil and gas industry, and considers human factors that contribute to accidents and fatalities in the area of oil and gas. Additionally, this book describes: Mathematical concepts Oil and gas industry equipment reliability characteristics Accident data and analysis Mathematical models used for performing safety and reliability-related analyses in the industry Safety and Reliability in the Oil and Gas Industry: A Practical Approach covers important aspects of safety in the offshore oil and gas industry. A reference designed with engineering professionals in mind, this book can also be used in oil- and gas-industry-related courses, and serves as a guide for anyone concerned with safety and reliability in the area of oil and gas.

A unique, design-based approach to reliabilityengineering Design for Reliability provides engineers and managerswith a range of tools and techniques for incorporating reliabilityinto the design process for complex systems. It clearly explainshow to design for zero failure of critical system functions,leading to enormous savings in product life-cycle costs and adramatic improvement in the ability to compete in globalmarkets. Readers will find a wealth of design practices not covered intypical engineering books, allowing them to think outside the boxwhen developing reliability requirements. They will learn toaddress high failure rates associated with systems that are notproperly designed for reliability, avoiding expensive andtime-consuming engineering changes, such as excessive testing,repairs, maintenance, inspection, and logistics. Special features of this book include: A unified approach that integrates ideas from computer scienceand reliability engineering Techniques applicable to reliability as well as safety,maintainability, system integration, and logistic engineering Chapters on design for extreme environments, developingreliable software, design for trustworthiness, and HALT influenceon design Design for Reliability is a must-have guide for engineersand managers in R&D, product development, reliabilityengineering, product safety, and quality assurance, as well asanyone who needs to deliver high product performance at a lowercost while minimizing system failure.

In two editions spanning more than a decade, The Electrical Engineering Handbook stands as the definitive reference to the multidisciplinary field of electrical engineering. Our knowledge continues to grow, and so does the Handbook. For the third edition, it has expanded into a set of six books carefully focused on a specialized area or field of study. Each book represents a concise yet definitive collection of key concepts, models, and equations in its respective domain, thoughtfully gathered for convenient access. Sensors, Nanoscience, Biomedical Engineering, and Instruments provides thorough coverage of sensors, materials and nanoscience, instruments and measurements, and biomedical systems and devices, including all of the basic information required to thoroughly understand each area. It explores the emerging fields of sensors, nanotechnologies, and biological effects. Each article includes defining terms, references, and sources of further information. Encompassing the work of the world's foremost experts in their respective specialties, Sensors, Nanoscience, Biomedical Engineering, and Instruments features the latest developments, the broadest scope of coverage, and new material on multisensor data fusion and MEMS and NEMS.

Human reliability and error have become a very important issue in health care, owing to the vast number of associated deaths each year. For example, according to the findings of the Institute of Medicine in 1999, around 100000 Americans die each year because of human error. This makes human error in health care the eighth leading cause of deaths in the US. Moreover, the total annual national cost of the medical errors is estimated at between $17 billion and $37.6 billion.There are very few books on this subject, and none of them covers it at a significant depth. The need for a book presenting the basics of human reliability, human factors and comprehensive information on error in medical systems is essential. This book meets that need.

Handbook of Reliability, Availability, Maintainability and Safety in Engineering Design

Fiber Optics Engineering

Reliability-based Structural Design

Applications in Multistage Interconnection Networks

Applied Reliability, Usability, and Quality for Engineers

Six Sigma Fundamentals

The engineer's ready reference for mechanical power and heat Mechanical Engineer's Handbook provides the most comprehensive coverage of the entire discipline, with a focus on explanation and analysis. Packaged as a modular approach, these books are designed to be used either individually or as a set, providing engineers with a thorough, detailed, ready reference on topics that may fall outside their scope of expertise. Each book provides discussion and examples as opposed to straight data and calculations, giving readers the immediate background they need while pointing them toward more in-depth information as necessary. Volume 4: Energy and Power covers the essentials of fluids, thermodynamics, entropy, and heat, with chapters dedicated to individual applications such as air heating, cryogenic engineering, indoor environmental control, and more. Readers will find detailed guidance toward fuel sources and their technologies, as well as a general overview of the mechanics of combustion. No single engineer can be a specialist in all areas that they are called on to work in the diverse industries and job functions they occupy. This book gives them a resource for finding the information they need, with a focus on topics related to the productions, transmission, and use of mechanical power and heat. Understand the nature of energy and its proper measurement and analysis Learn how the mechanics of energy apply to furnaces, refrigeration, thermal systems, and more Examine the and pros and cons of petroleum, coal, biofuel, solar, wind, and geothermal power Review the mechanical parts that generate, transmit, and store different types of power, and the applicable guidelines Engineers must frequently refer to data tables, standards, and other list-type references, but this book is different; instead of just providing the answer, it explains why the answer is what it is. Engineers will appreciate this approach, and come to find Volume 4: Energy and Power an invaluable reference.

Engineering systems are an important element of world economy. Each year billions of dollars are spent to develop, manufacture, operate, and maintain various types of engineering systems about the globe. The reliability and usability of these systems have become important because of their increasing complexity, sophistication, and non-specialist users. Global competition and other factors are forcing manufacturers to produce highly reliable and usable engineering systems. Along with examples and solutions, this book integrates engineering systems reliability and usability into a single volume for those individuals that directly or indirectly are concerned with these areas.

This handbook studies the combination of various methods of designing for reliability, availability, maintainability and safety, as well as the latest techniques in probability and possibility modeling, mathematical algorithmic modeling, evolutionary algorithmic modeling, symbolic logic modeling, artificial intelligence modeling and object-oriented computer modeling.

The demands of the global economy require manufacturers to produce highly reliable and easily maintainable engineering products. Recent studies indicate that for many large and sophisticated products or systems, maintenance, and support account for as much as 60 to 75 percent of their life cycle costs. Therefore, the role of maintainability, mainte

Systems Reliability and Usability for Engineers

Design Reliability

Transportation Systems Reliability and Safety

A Complete Introduction to the System, Methods, and Tools

Applied Reliability for Engineers

Mechanical Engineers' Handbook, Design, Instrumentation, and Controls

This book presents fundamentals of reliability engineering withits applications in evaluating reliability of multistageinterconnection networks. In the first part of the book, itintroduces the concept of reliability engineering, elements ofprobability theory, probability distributions, availability anddata analysis. The second part of the book provides anoverview of parallel/distributed computing, network designconsiderations, and more. The book covers a comprehensivereliability engineering methods and its practical aspects in theinterconnection network systems. Students, engineers, researchers,managers will find this book as a valuable reference source.

Computer systems have become an important element of the world economy, with billions of dollars spent each year on development, manufacture, operation, and maintenance. Combining coverage of computer system reliability, safety, usability, and other related topics into a single volume, Computer System Reliability: Safety and Usability eliminates the need to consult many different and diverse sources in the hunt for the information required to design better computer systems. After presenting introductory aspects of computer system reliability such as safety, usability-related facts and figures, terms and definitions, and sources for obtaining useful information on computer system reliability, safety, and usability, the book: Reviews mathematical concepts considered useful to understanding subsequent chapters Presents various introductory aspects of reliability, safety, and usability and computer system reliability basics Covers software reliability assessment and improvement methods Discusses important aspects of software quality and human error and software bugs in computer systems Highlights software safety and Internet reliability Details important aspects of software usability including the need for considering usability during the software development phase, software usability engineering process, software usability inspection methods, software usability test methods, and guidelines for conducting software usability testing Elucidates web usability facts and figures, common design errors, web page design, tools for evaluating web usability, and questions to evaluate website message communication effectiveness Examines important aspects of computer system life cycle costing Written by systems reliability expert B.S. Dhillon, the book is accessible to all levels of readership, making it useful to beginners and seasoned professionals alike. Reflecting practical trends in computer engineering especially in the area of software, Dhillon emphasizes the importance of usability in software systems and expands reliability to web usability and management. It provides methods for designing systems with increased reliability, safety, and usability.

Cradle-to-grave analyses are becoming the norm, as an increasing amount of corporations and government agencies are basing their procurement decisions not only on initial costs but also on life cycle costs. And while life cycle costing has been covered in journals and conference proceedings, few, if any, books have gathered this information into an

Today, engineering systems are an important element of the world economy and each year billions of dollars are spent to develop, manufacture, operate, and maintain various types of engineering systems around the globe. Many of these systems are highly sophisticated and contain millions of parts. For example, a Boeing jumbo 747 is made up of approximately 4.5 million parts including fasteners. Needless to say, reliability, safety, and maintenance of systems such as this have become more important than ever before. Global competition and other factors are forcing manufacturers to produce highly reliable, safe, and maintainable engineering products. Therefore, there is a definite need for the reliability, safety, and maintenance professionals to work closely during design and other phases. Engineering Systems Reliability, Safety, and Maintenance: An Integrated Approach eliminates the need to consult many different and diverse sources in the hunt for the information required to design better engineering systems.

A Modern Approach

Engineering Systems Reliability, Safety, and Maintenance

Sensors Nanoscience Biomedical Engineering

Methodologies and Circuit Architectures

Computer Safety, Reliability, and Security

A Practical Approach

Within the past few decades, information technologies have been evolving at a tremendous rate, causing profound changes to our world and our ways of life. In particular, fiber optics has been playing an increasingly crucial role within the telecommunication revolution. Not only most long-distance links are fiber based, but optical fibers are increasingly approaching the individual end users, providing wide bandwidth links to support all kinds of data-intensive applications such as video, voice, and data services. As an engineering discipline, fiber optics is both fascinating and challenging. Fiber optics is an area that incorporates elements from a wide range of techno- gies including optics, microelectronics, quantum electronics, semiconductors, and networking. As a result of rapid changes in almost all of these areas, fiber optics is a fast evolving field. Therefore, the need for up-to-date texts that address this growing field from an interdisciplinary perspective persists. This book presents an overview of fiber optics from a practical, engineering perspective. Therefore, in addition to topics such as lasers, detectors, and optical fibers, several topics related to electronic circuits that generate, detect, and process the optical signals are covered. In other words, this book attempts to present fiber optics not so much in terms of a field of "optics" but more from the perspective of an engineering field within "optoelectronics.

Due to global competition, safety regulations, and other factors, manufacturers are increasingly pressed to create products that are safe, highly reliable, and of high quality. Engineers and quality assurance professionals need a cross-disciplinary understanding of these topics in order to ensure high standards in the design and manufacturing proce

Each year billions of dollars are being spent in the area of nuclear power generation to design, construct, manufacture, operate, and maintain various types of systems around the globe. Many times these systems fail due to safety, reliability, human factors, and human error related problems. The main objective of this book is to combine nuclear power plant safety, reliability, human factors, and human error into a single volume for those individuals that work closely during the nuclear power plant design phase, as well as other phases, thus eliminating the need to consult many different and diverse sources in obtaining the desired information.

This book focuses on the basics of the six sigma methodology. It targets on both manufacturing as well as non-manufacturing organizations and demystifies the Six Sigma methodology. The book addresses the concepts of the Six Sigma philosophy and explains the methodologies involved in it.

Sensors, Nanoscience, Biomedical Engineering, and Instruments

Reliability Technology, Human Error, and Quality in Health Care

Safety, Reliability, Human Factors, and Human Error in Nuclear Power Plants

Life Cycle Costing for Engineers

Designing Data-Intensive Applications

Applied Reliability and Quality

To meet the needs of today, engineered products and systems are an important element of the world economy, and each year billions of dollars are spent to develop, manufacture, operate, and maintain various types of products and systems around the globe. This book integrates and combines three of those topics to meet today's needs for the engineers working in these fields. This book provides a single volume that considers reliability, maintainability, and safety when designing new products and systems. Examples along with their solutions are placed at the end of each chapter to test readers' comprehension. The book is written in a manner that readers do not need any previous knowledge of the subject, and many references are provided. This book is also useful to many people, including design engineers, system engineers, reliability specialists, safety professionals, maintainability engineers, engineering administrators, graduate and senior undergraduate students, researchers, and instructors.

Design ReliabilityFundamentals and ApplicationsCRC Press

As engineering systems become more and more complex, industry has recognized the importance of system and product reliability and places ever increasing emphasis on it during the design phase. Despite its efforts, however, industry continues to lose billions of dollars each year because of unexpected system failures. Therefore, it becomes increasingly important for designers and engineers to have a solid grounding in reliability engineering and keep abreast of new developments and research results.

Global competition is forcing reliability and other professionals to work closely during the product design and manufacturing phase. Because of this collaboration, reliability, usability, and quality principles are being applied across many diverse sectors of the economy. This book offers the principles, methods, and procedures for these areas in one resource. This book brings together the areas of reliability, usability, and quality for those working in diverse areas to allow them to be exposed to activities that can help them perform their tasks more effectively. This is the only book that covers these areas together in this manner and written in such a way that no previous knowledge is required to understand it. The sources of the material presented are included in the reference section at the end of each chapter along with examples and solutions to test reader comprehension. Applied Reliability, Usability, and Quality for Engineers is useful to design, manufacturing, and systems engineers, as well as manufacturing managers, reliability, usability and, quality specialists. It can also be helpful to graduate, senior undergraduate students, and instructors.

Fundamentals of Reliability Engineering

Safety and Usability

26th International Conference, SAFECOMP 2007, Nurmberg, Germany, September 18-21, 2007, Proceedings

Safety and Reliability in the Oil and Gas Industry

Robot System Reliability and Safety

Time-To-Failure Modeling

Today's marketplace demands product reliability. At the same time, it places ever-increasing demands on products that push the limits of their performance and their functional life, and it does so with the expectation of lower per-unit product costs. To meet these demands, product design now requires a focused, streamlined, concurrent engineering process that will produce a product at the lowest possible cost in the least amount of time. Design for Reliability provides a systematic approach to the design process that is sharply focused on reliability and firmly based on the physics of failure. It imparts an understanding of how, why, and when to use the wide variety of reliability engineering tools available and offers fundamental insight into the total design cycle. Applicable from the idea phase of the product development cycle through product obsolescence, Design for Reliability (DfR) concepts integrated with reliability verification and analytical physics form a coherent stage gate/phase design process that helps ensure that a product will meet customers' reliability objectives. Whether you are a high-volume manufacturer of consumer items or a low volume producer of military commodities, your goal is the same: to bring a product to market using a process focused on designing out or mitigating potential failure modes prior to production release. Readers of Design for Reliability will learn to meet that goal and move beyond solidifying a basic offering to the marketplace to creating a true competitive advantage.

From its origins in the malachite mines of ancient Egypt, mining has grown to become a global industry which employs many hundreds of thousands of people. Today, the mining industry makes use of various types of complex and sophisticated equipment, for which reliability, maintainability and safety has become an important issue. Mining Equipment Reliability, Maintainability and Safety is the first book to cover these three topics in a single volume. Mining Equipment Reliability, Maintainability and Safety will be useful to a range of individuals from administrators and engineering professionals working in the mining industry to students, researchers and instructors in mining engineering, as well as design engineers and safety professionals. All topics covered in the book are treated in such a manner that the reader requires no previous knowledge to understand the contents. Examples, solutions and test problems are also included to aid reader comprehension.

This book is intended to give a general overview of reliability, faults, fault models, nanotechnology, nanodevices, fault-tolerant architectures and reliability evaluation techniques. Additionally, the book provides an in depth state-of-the-art research results and methods for fault tolerance as well as the methodology for designing fault-tolerant systems out of highly unreliable components.

This book constitutes the refereed proceedings of the 26th International Conference on Computer Safety, Reliability, and Security, SAFECOMP 2007. The 33 revised full papers and 16 short papers are organized in topical sections on safety cases, impact of security on safety, fault tree analysis, safety analysis, security aspects, verification and validation, platform reliability, reliability evaluation, formal methods, static code analysis, safety-related architectures.

Mining Equipment Reliability, Maintainability, and Safety

Environmentally Conscious Mechanical Design

Fundamentals and Applications

An Integrated Approach

Medical Device Reliability and Associated Areas

An effective reliability programme is an essential component of every product's design, testing and efficient production. From the failure analysis of a microelectronic device to software fault tolerance and from the accelerated life testing of mechanical components to hardware verification, a common underlying philosophy of reliability applies. Defining both fundamental and applied work across the entire systems reliability arena, this state-of-the-art reference presents methodologies for quality, maintainability and dependability. Featuring: Contributions from 60 leading reliability experts in academia and industry giving comprehensive and authoritative coverage. A distinguished international Editorial Board ensuring clarity and precision throughout. Extensive references to the theoretical foundations, recent research and future directions described in each chapter. Comprehensive subject index providing maximum utility to the reader. Applications and examples across all branches of engineering including IT, power, automotive and aerospace sectors. The handbook's cross-disciplinary scope will ensure that it serves as an indispensable tool for researchers in industrial, electrical, electronics, computer, civil, mechanical and systems engineering. It will also aid professional engineers to find creative reliability solutions and management to evaluate systems reliability and to improve processes. For student research projects it will be the ideal starting point whether addressing basic questions in communications and electronics or learning advanced applications in micro-electro-mechanical systems (MEMS), manufacturing and high-assurance engineering systems.

Safety and Reliability - Safe Societies in a Changing World collects the papers presented at the 28th European Safety and Reliability Conference, ESREL 2018 in Trondheim, Norway, June 17-21, 2018. The contributions cover a wide range of methodologies and application areas for safety and reliability that contribute to safe societies in a changing world. These methodologies and applications include: - foundations of risk and reliability assessment and management - mathematical methods in reliability and safety - risk assessment - risk management - system reliability - uncertainty analysis - digitalization and big data - prognostics and system health management - occupational safety - accident and incident modeling - maintenance modeling and applications - simulation for safety and reliability analysis - dynamic risk and barrier management - organizational factors and safety culture - human factors and human reliability - resilience engineering - structural reliability - natural hazards - security - economic analysis in risk management Safety and Reliability - Safe Societies in a Changing World will be invaluable to academics and professionals working in a wide range of industrial and governmental sectors: offshore oil and gas, nuclear engineering, aeronautics and aerospace, marine transport and engineering, railways, road transport, automotive engineering, civil engineering, critical infrastructures, electrical and electronic engineering, energy production and distribution, environmental engineering, information technology and telecommunications, insurance and finance, manufacturing, marine transport, mechanical engineering, security and protection, and policy making.

Engineering systems and products are an important element of the world economy and each year billions of dollars are spent to develop, manufacture, operate, and maintain systems and products around the globe. Because of this, global competition is requiring reliability professionals to work closely with other departments involved in engineering development during the product design and manufacturing phase. Applied Reliability for Engineers is an attempt to meet the need for a single volume that addresses a wide range of applied reliability topics. The material is treated in such a manner that the reader will require no previous knowledge to understand the text. The sources of most of the information presented are given in a reference section at the end of each chapter. At appropriate places, the book contains examples along with their solutions. At the end of each chapter there are numerous problems to test reader comprehension. This volume is thus suitable for use as a textbook as well as for reference. Applied Reliability for Engineers is useful to design professionals, system engineers, reliability specialists, graduate and senior undergraduate students, researchers and instructors of reliability engineering, and engineers-at-large.

"Reliability Physics and Engineering" provides critically important information for designing and building reliable cost-effective products. The textbook contains numerous example problems with solutions. Included at the end of each chapter are exercise problems and answers. "Reliability Physics and Engineering" is a useful resource for students, engineers, and materials scientists.

Engineering Design Reliability Handbook

Reliability of Nanoscale Circuits and Systems

Diesel Engine System Design

Reliability, Maintainability, and Safety for Engineers

Handbook of Reliability Engineering

Optimal Reliability Design

Diesel Engine System Design links everything diesel engineers need to know about engine performance and system design in order for them to master all the essential topics quickly and to solve practical design problems. Based on the author's unique experience in the field, it enables engineers to come up with an appropriate specification at an early stage in the product development cycle. Links everything diesel engineers need to know a engine performance and system design featuring essential topics and techniques to solve practical design problems Focuses on engine performance and system integration including important approaches for modelling and analysis Explores fundamental concepts and generic techniques in diesel engine system design incorporating durability, reliability and optimization theories

Although Reliability Engineering can trace its roots back to World War II, its application to medical devices is relatively recent, and its treatment in the published literature has been quite limited. With the medical device industry among the fastest growing segments of the US economy, it is vital that the engineering, biomedical, manufacturing, and design communities have up-to-date information on current developments, tools, and technique Medical Device Reliability and Associated Areas fills this need with broad yet detailed coverage of the field. It addresses a variety of topics related - directly and indirectly - to reliability, including human error in health care systems and software quality assurance. With emphasis on concepts rather than mathematical rigor, a multitude of examples, exercises, tables, and references, this is one resource that everyone connected to the medical industry must have.

This volume focuses on environmental design - understanding it and implementing it. Coverage includes the important technical and analytical techniques and best practices of designing industrial, business, and consumer products that are environmentally friendly and meet environmental regulations.

During day-to-day use, thousands of lives are lost each year due to accidents, directly or indirectly, resulting from poor transportation system reliability and safety. In the United States, automobile accidents alone result in around 42,000 deaths per year, costing billions of dollars to the economy each year. A common subject in journal articles

Safety and Reliability. Theory and Applications

Computer System Reliability

Reliability Physics and Engineering

The Big Ideas Behind Reliable, Scalable, and Maintainable Systems

Reliability, Quality, and Safety for Engineers

Proceedings of ESREL 2018, June 17-21, 2018, Trondheim, Norway

Each industry, from robotics to health care, power generation to software, has its own tailored reliability and quality principles, methods, and procedures. This book brings these together so that reliability and quality professionals can more easily learn about each other's work, which may help them, directly or indirectly, to perform their tasks more effectively.

As robots are used more and more to perform a variety of tasks in a range of fields, it is imperative to make the robots as reliable and safe as possible. Yet no book currently covers robot reliability and safety within one framework. Robot System Reliability and Safety: A Modern Approach presents up-to-date information on robot reliability, safety, and related areas in a single volume, eliminating the need to consult diverse sources. After introducing historical, mathematical, and introductory aspects, the book presents methods for analyzing robot system reliability and safety. It next focuses on topics related to robot reliability, including classifications of robot failures and their causes and hydraulic and electric robots' reliability analysis. The book then explains the analysis of robot-related safety and accidents, covers key elements of robot maintenance and robotics applications in maintenance and repair, and addresses human factors and safety considerations in robotics workplaces. The book concludes with chapters on robot testing, costing, and failure data as well as six mathematical models for reliability and safety analysis. Written by a well-known expert in reliability engineering, this book will be useful to system, design, reliability, and safety engineers along with other engineering professionals working in the area of robotics. It can also be used in courses on system engineering, reliability engineering, and safety engineering.

Safety and Reliability – Theory and Applications contains the contributions presented at the 27th European Safety and Reliability Conference (ESREL 2017, Portorož, Slovenia, June 18-22, 2017). The book covers a wide range of topics, including: • Accident and Incident modelling • Economic Analysis in Risk Management • Foundational Issues in Risk Assessment and Management • Human Factors and Human Reliability • Maintenance Modeling and Applications • Mathematical Methods in Reliability and Safety • Prognostics and System Health Management • Resilience Engineering • Risk Assessment • Risk Management • Simulation for Safety and Reliability Analysis • Structural Reliability • System Reliability, and • Uncertainty Analysis. Selected special sessions include contributions on: the Marie Skłodowska-Curie innovative training network in structural safety; risk approaches in insurance and fi nance sectors; dynamic reliability and probabilistic safety assessment; Bayesian and statistical methods, reliability data and testing; oganizational factors and safety culture; software reliability and safety; probabilistic methods applied to power systems; socio-technical-economic systems; advanced safety assessment methodologies: extended Probabilistic Safety Assessment; reliability; availability; maintainability and safety in railways: theory & practice; big data risk analysis and management, and model-based reliability and safety engineering. Safety and Reliability – Theory and Applications will be of interest to professionals and academics working in a wide range of industrial and governmental sectors including: Aeronautics and Aerospace, Automotive Engineering, Civil Engineering, Electrical and Electronic Engineering, Energy Production and Distribution, Environmental Engineering, Information Technology and Telecommunications, Critical Infrastructures, Insurance and Finance, Manufacturing, Marine Industry, Mechanical Engineering, Natural Hazards, Nuclear Engineering, Offshore Oil and Gas, Security and Protection, Transportation, and Policy Making.

This book provides readers with an understanding of the fundamentals and applications of structural reliability, stochastic finite element method, reliability analysis via stochastic expansion, and optimization under uncertainty. It examines the use of stochastic expansions, including polynomial chaos expansion and Karhunen-Loeve expansion for the reliability analysis of practical engineering problems.

Fundamentals, Methods and Procedures

Safety and Reliability – Safe Societies in a Changing World

Design for Reliability

Human Reliability And Error In Medical System

Maintainability, Maintenance, and Reliability for Engineers

Researchers in the engineering industry and academia are making important advances on reliability-based design and modeling of uncertainty when data is limited. Non deterministic approaches have enabled industries to save billions by reducing design and warranty costs and by improving quality. Considering the lack of comprehensive and defini

The effective and interrelated functioning of system reliability technology, human factors, and quality play an important role in the appropriate, efficient, and cost-effective delivery of health care. Simply put, it can save you time, money, and more importantly, lives. Over the years a large number of journal and conference proceedings articles on these topics have been published, but there are only a small number of books written on each individual topic, and virtually none that brings the pieces together into a unified whole.

Optimal Reliability Design provides a detailed introduction to systems reliability and reliability optimization. State-of-the-art techniques for maximizing system reliability are described, focusing on component reliability enhancement and redundancy arrangement. The authors present several case studies and show how optimization techniques are applied in practice. They also pay particular attention to finding methods that give the optimal trade-off between reliability and cost. The book is suitable for use on graduate-level courses in reliability engineering and operations research. It will also be a valuable reference for practising engineers.

Data is at the center of many challenges in system design today. Difficult issues need to be figured out, such as scalability, consistency, reliability, efficiency, and maintainability. In addition, we have an overwhelming variety of tools, including relational databases, NoSQL datastores, stream or batch processors, and message brokers. What are the right choices for your application? How do you make sense of all these buzzwords? In this practical and comprehensive guide, author Martin Kleppmann helps you navigate this diverse landscape by examining the pros and cons of various technologies for processing and storing data. Software keeps changing, but the fundamental principles remain the same. With this book, software engineers and architects will learn how to apply those ideas in practice, and how to make full use of data in modern applications. Peer under the hood of the systems you already use, and learn how to use and operate them more effectively Make informed decisions by identifying the strengths and weaknesses of different tools Navigate the trade-offs around consistency, scalability, fault tolerance, and complexity Understand the distributed systems research upon which modern databases are built Peek behind the scenes of major online services, and learn from their architectures