The design, construction, operation, and retrofit of buildings is evolving in response to ever-increasing knowledge about the impact of indoor environments on people and the impact of buildings on the environment. Research has shown that the quality of indoor environments can affect the health, safety, and productivity of the people who occupy them. Buildings are also resource intensive, accounting for 40 percent of primary energy use in the United States, 12 percent of water consumption, and 60 percent of all non-industrial waste. The processes for producing electricity at power plants and delivering it for use in buildings account for 40 percent of U.S. greenhouse gas emissions. The U.S. federal government manages approximately 429,000 buildings of many types with a total square footage of 3.34 billion worldwide, of which about 80 percent is owned space. More than 30 individual departments and agencies are responsible for managing these buildings. The characteristics of each agency’s portfolio of facilities are determined by its mission and its programs. In 2010, GSA's Office of Federal High-Performance Green Buildings asked the National Academies to appoint an ad hoc committee of experts to conduct a public workshop and prepare a report that identified strategies and approaches for achieving a range of objectives associated with high-performance green federal buildings. Achieving High-Performance Federal Facilities identifies examples of important initiatives taking place and available resources. The report explores how these examples could be used to help make sustainability the preferred choice at all levels of decision making. Achieving High-Performance Federal Facilities can serve as a valuable guide federal agencies with differing missions, types of facilities, and operating procedures.

How can smart technology open up new design opportunities – for the design, the execution, and the operation of buildings and for the digitalization of construction? A hitherto unusual conception of the building as a cybernetic architectural system forms the basis of this integrated design approach. The authors – architects and engineers with extensive design experience – contribute an overview of current technical components of automation and communication systems, as well as a summary of relevant laws, standards, and guidelines. Six example projects demonstrate completed applications at different scales, from a single-family residence to office buildings, and through to the Elbphilharmonie concert hall – amply illustrated in text, drawings, and photos.

This book will present the theory involved in wastewater treatment processes, define the important design parameters involved, and provide typical values of these parameters for ready reference; and also provide numerical applications and step-by-step calculation procedures in solved examples. These examples and solutions will help enhance the readers’ comprehension and deeper understanding of the basic concepts, and can be applied by plant designers to design various components of the treatment facilities. It will also examine the actual calculation steps in numerical examples, focusing on practical application of theory and principles into process and water treatment facility design.

This book presents selected papers from the 1999 CIRP International Design Seminar. Design is a fundamental creative human activity. This certainly applies to the design of artifacts, the realisation of which has to meet ever-increasing demands. All ideas for new and better artifacts have been elaborated by designers, who have turned them into feasible concepts and finally transformed them into realisable product models. Design knowledge is difficult to capture. Design, as a process, is difficult to organise. The analysis and structuring of design (process) knowledge is necessary in order to build design support systems. Furthermore, substantial research effort is still needed to develop design as a `science of synthesis'. The principles of synthesis need to be better understood before design methods and computer support tools can
be developed, which are fit for integration in the industrial manufacturing process. This volume includes an introduction to design theories and methods, design and engineering processes, the role of computer support tools, and artificial intelligence in design support. The other contributions can be divided roughly into two categories. The first category deals with design support tools in relation to such topics as conceptual design, collaborative design, modelling, design optimization and evaluation. The second category treats the control of design and engineering processes in relation to subjects such as product and process knowledge, process representation, synthesis of thought and methods, integration, and concurrency.

Design and Operation of Solid Oxide Fuel Cells: The Systems Engineering Vision for Industrial Application presents a comprehensive, critical and accessible review of the latest research in the field of solid oxide fuel cells (SOFCs). As well as discussing the theoretical aspects of the field, the book explores a diverse range of power applications, such as hybrid power plants, polygeneration, distributed electricity generation, energy storage and waste management—all with a focus on modeling and computational skills. Dr. Sharifzadeh presents the associated risks and limitations throughout the discussion, providing a very complete and thorough analysis of SOFCs and their control and operation in power plants. The first of its kind, this book will be of particular interest to energy engineers, industry experts and academic researchers in the energy, power and transportation industries, as well as those working and researching in the chemical, environmental and material sectors. Closes the gap between various power engineering disciplines by considering a diverse variety of applications and sectors. Presents and reviews a variety of modeling techniques and considers regulations throughout. Includes CFD modeling examples and process simulation and optimization programming guidance.

Based on the author's over 35 years of experience in all phases of the design of water treatment facilities, it covers research pilot studies, preliminary design studies and the actual design, construction and plant management as well—and is especially geared toward professional engineers and college students who seek emphasis on the practical rather than principle, method rather than methodology. Unlike other books on the subject, this work covers the entire project sequence, describing not only very basic and essential design criteria for each process but also how to design each phase in a way that will maximize overall process efficiency while minimizing operation and maintenance costs. As such, it will serve not only as a useful guide and reference for design of water treatment plants, but also as a tool for project and operations control.

Organizations have to work continuously on the improvement of the quality of their products and services to secure future profit. They have also to develop and deliver timely new innovations and products. But the development of these new innovations and products is always both a challenging and a difficult process. Challenging because it enables us to exploit new ways, challenges and possibilities, and difficult because it requires choices to be made, which exclude other challenges and possibilities. Each choice or possibility in the design process also means financial consequences or a specific cost price and so impacts upon future profitability. Well designed products promise profit, whilst a poor design can even result in losses. So design as a profession is not only a challenging one but also a risky one. But no improvement means no future profits. Value creation will be the red line in this book. How to organize the right design process is the main topic. This will mean an integration of all stakeholders around the design and engineering processes of products and services. This process can deliver the right prospects for client satisfaction and value creation. Organizing the design processes of a design team around all the stakeholders is necessary and the quality of this team will be a main factor for success. Another important factor is to investigate and weight the right client needs, demands and wishes. And finally, the effective utilization of information technology as a knowledge tool around design and engineering processes is also a
key factor. What lessons will you learn after reading and in particular applying this book: What is involved in setting up a design and engineering process that is client oriented and value driven for your organization. How to organize an improvement of existing products and services with all the stakeholders. How to implement the role of information technology over the whole life cycle of a product, including the reuse of proven knowledge. Exciting applications from the fields of designing products, of building services and of asset management.

SMC COLOMBIER FONTAINE is a company in the AFE METAL group, which uses a sand casting process to manufacture steel primary parts. To reduce the "time to market", primary part producers need to reduce the time and cost of the industrialisation process. These factors, in addition to the global goal of improving process performance levels, brought SMC to develop numerical technologies and traceability from quotation to part delivery [1]. Nowadays, these improvements are incorporated into company culture. The next step in reducing the time and cost of the production process is to introduce a complete methodology of use and experience feedback of these new models and methods. To be able to generalise this approach, a CAD methodology is essential and thus becomes a step in the industrialisation process. The amount of improvements engendered by the numerical technologies largely justifies the time investment made to obtain a numerical definition of all the different elements in the sand casting process [2]. The objective of our approach is to optimise the product and its production process by generating a complete numerical reference, through the integration of quotation, CAD, simulation, new manufacturing technologies and effective production processes.

The 33 papers presented in this book were selected from amongst the 97 papers presented during the sixth edition of the International Conference on Integrated Design and Manufacturing in Mechanical Engineering during 28 sessions. This conference represents the state-of-the-art research in the field. Two keynote papers introduce the subject of the Conference and are followed by the different themes highlighted during the conference.

"Provides both the client and the constructor with the necessary information to utilise an IDC approach in the procurement and construction of buildings"--

Written by an architect who is director of sustainability at a global architecture firm, this is a guide for architects and related construction professionals to design and build net zero commercial architecture. It offers practical strategies, step-by-step technical analysis, and valuable examples in addition to developed case studies. With a focus on application in a variety of building types and scales, the book also develops a broad based understanding of all the integrated principles involved in achieving net zero energy. The book is a practical guide for anyone venturing into net zero energy design, construction and operation, and also serves as an excellent resource on a variety of sustainable design topics.

This comprehensive work shows how to design and develop innovative, optimal and sustainable chemical processes by applying the principles of process systems engineering, leading to integrated sustainable processes with 'green' attributes. Generic systematic methods are employed, supported by intensive use of computer simulation as a powerful tool for mastering the complexity of physical models. New to the second edition are chapters on product design and batch processes with applications in specialty chemicals, process intensification methods for designing compact equipment with high energetic efficiency, plantwide control for managing the key factors affecting
the plant dynamics and operation, health, safety and environment issues, as well as sustainability analysis for achieving high environmental performance. All chapters are completely rewritten or have been revised. This new edition is suitable as teaching material for Chemical Process and Product Design courses for graduate MSc students, being compatible with academic requirements world-wide. The inclusion of the newest design methods will be of great value to professional chemical engineers. Systematic approach to developing innovative and sustainable chemical processes Presents generic principles of process simulation for analysis, creation and assessment Emphasis on sustainable development for the future of process industries Integrated Design and Operation of Water Treatment Facilities John Wiley & Sons This volume contains the selected papers of the first I.D.M.M.E. conference on 'Integrated Design and Manufacturing in Mechanical Engineering', held in Nantes from 15-17 April 1996. Its objective was to discuss the questions related to the definition of the optimal design and manufacturing processes and to their integration through coherent methodologies in adapted environments. The initiative of the Conference and the organization thereof, is mainly due to the efforts of the french PRIMECA group (Pool of Computer Resources for Mechanics) started eight years ago. We were able to attract the internationru community with the support of the International Institution for Production Engineering Research (C.I.R.P.). The conference brought together two hundred and fifty specialists from around the world. About ninety papers and twenty posters were presented covering three main topics: optimization and evaluation of the product design process, optimization and evaluation of the manufacturing systems and methodological aspects. Integrated Design and Delivery Solutions (IDDS) represent a significant new research trajectory in the integration of architecture and construction through the rapid adoption of new processes. This book examines the ways in which collaboration and new methods of contracting and procurement enhance skills and improve processes in terms of lean and sustainable construction. Based on high quality research and practice-based examples that provide key insights into IDDS and its future potential, this book surveys the technologies that are being employed to create more sustainable buildings with added value for clients, stakeholders and society as whole. The U.S. Army is pilot testing chemical hydrolysis as a method for destroying the chemical agents stockpiled at Aberdeen, Maryland (HD mustard agent), and Newport, Indiana (VX nerve agent). The chemical agents at both locations, which are stored only in bulk ton containers, will be hydrolyzed (using aqueous sodium hydroxide for VX and water for HD) at slightly below the boiling temperature of the solution. The resulting hydrolysate at Aberdeen, which will contain thiodiglycol as the primary reaction product, will be treated by activated sludge biodegradation in sequencing batch reactors to oxidize organic constituents prior to discharge to an on-site federally owned wastewater treatment facility. The hydrolysate at Newport, which will contain a thiol amine and methyl phosphonic acid as the major reaction products, is not readily amenable to treatment by biodegradation. Therefore, organic constituents will be treated using supercritical water oxidation (SCWO). Integrated Design of Alternative Technologies for Bulk-Only Chemical Agent Disposal Facilities focuses on the overarching issues in the process designs integrating individual processing steps, including potential alternative configurations and process safety and reliability. This report reviews the acquisition design packages (ADPs) for the ABCDF and NECDF prepared by Stone and Webster Engineering Company for the U.S. Army. Optimal Operation of Integrated Multi-Energy Systems Under Uncertainty discusses core
concepts, advanced modeling and key operation strategies for integrated multi-energy systems geared for use in optimal operation. The book particularly focuses on reviewing novel operating strategies supported by relevant code in MATLAB and GAMS. It covers foundational concepts, key challenges and opportunities in operational implementation, followed by discussions of conventional approaches to modeling electricity, heat and gas networks. This modeling is the base for more detailed operation strategies for optimal operation of integrated multi-energy systems under uncertainty covered in the latter part of the work. Reviews advanced modeling approaches relevant to the integration of electricity, heat and gas systems in operation studies. Covers stochastic and robust optimal operation of integrated multi-energy systems. Evaluates MPC based, real-time dispatch of integrated multi-energy systems. Considers uncertainty modeling for stochastic and robust optimization. Assesses optimal operation and real-time dispatch for multi-energy building complexes.

Hailed on its initial publication as a real-world, practical handbook, the second edition of Handbook of Water and Wastewater Treatment Plant Operations continues to make the same basic point: water and wastewater operators must have a basic skill set that is both wide and deep. They must be generalists, well-rounded in the sciences, cyber operations, math operations, mechanics, technical concepts, and common sense. With coverage that spans the breadth and depth of the field, the handbook explores the latest principles and technologies and provides information necessary to prepare for licensure exams. Expanded from beginning to end, this second edition provides a no-holds-barred look at current management issues and includes the latest security information for protecting public assets. It presents in-depth coverage of management aspects and security needs and a new chapter covering the basics of blueprint reading. The chapter on water and wastewater mathematics has tripled in size and now contains an additional 200 problems and 350 math system operational problems with solutions. The manual examines numerous real-world operating scenarios, such as the intake of raw sewage and the treatment of water via residual management, and each scenario includes a comprehensive problem-solving practice set. The text follows a non-traditional paradigm based on real-world experience and proven parameters. Clearly written and user friendly, this revision of a bestseller builds on the remarkable success of the first edition. This book is a thorough compilation of water science, treatment information, process control procedures, problem-solving techniques, safety and health information, and administrative and technological trends.

A considerable amount of scientific evidence has been collected leading to the conclusion that urban wastewater components should be designed as one integrated system, in order to protect the receiving waters cost-effectively. Moreover, there is a need to optimize the design and operation of the sewerage network and wastewater treatment plant (WwTP) considering the dynamic interactions between them and the receiving waters. This book introduces a method called Model Based Design and Control (MoDeCo) for the optimum design and control of urban wastewater components. The book presents a detailed description of the integration of modelling tools for the sewer, the wastewater treatment plants and the rivers. The complex modelling structure used for the integrated model challenge previous applications of integrated modelling approaches presented in scientific literature. The combination of modelling tools and multi-objective evolutionary algorithms demonstrated in this book represent an excellent tool for designers and managers of urban wastewater infrastructure. This book also presents two alternatives to solve the computing demand of the optimization of integrated systems in practical applications: the use of surrogate modelling tools and the use of cloud computer infrastructure for parallel computing. The book gives a systematic and detailed description of a new integrated product and process development approach for sheet metal manufacturing. Special attention is given to manufacturing that unites multidisciplinary competences of product design, material science,
and production engineering, as well as mathematical optimization and computer based
information technology. The case study of integral sheet metal structures is used by the
authors to introduce the results related to the recent manufacturing technologies of linear flow
splitting, bend splitting, and corresponding integrated process chains for sheet metal
structures.

The 18th European Symposium on Computer Aided Process Engineering contains papers
presented at the 18th European Symposium of Computer Aided Process Engineering
(ESCAPE 18) held in Lyon, France, from 1-4 June 2008. The ESCAPE series brings the latest
innovations and achievements by leading professionals from the industrial and academic
communities. The series serves as a forum for engineers, scientists, researchers, managers
and students from academia and industry to: - present new computer aided methods,
algorithms, techniques related to process and product engineering, - discuss innovative
concepts, new challenges, needs and trends in the area of CAPE. This research area bridges
fundamental sciences (physics, chemistry, thermodynamics, applied mathematics and
computer sciences) with the various aspects of process and product engineering. The special
theme for ESCAPE-18 is CAPE for the Users! CAPE systems are to be put in the hands of end
users who need functionality and assistance beyond the scientific and technological capacities
which are at the core of the systems. The four main topics are: - off-line systems for synthesis
and design, - on-line systems for control and operation, - computational and numerical
solutions strategies, - integrated and multi-scale modelling and simulation. Two general topics
address the impact of CAPE tools and methods on Society and Education. * CD-ROM that
accompanies the book contains all research papers and contributions * International in scope
with guest speeches and keynote talks from leaders in science and industry * Presents papers
covering the latest research, key top areas and developments in Computer Aided Process
Engineering

Integrated Design of a Product Family and Its Assembly System presents an
integrated approach for the design of a product family and its assembly system,
whose main principles consider the product family as a fictitious unique product
for which the assembly system is to be devised. It imposes assembly and
operation constraints as late as possible in the design process to get liberties in
the system design, and adapts the product family at each design stage to
integrate the new constraints related to the successive design choices. Integrated
Design of a Product Family and Its Assembly System is an important, must-have
book for researchers and Ph.D. students in Computer-Integrated Manufacturing,
Mechanical Engineering, and Manufacturing, as well as practitioners in the
Design, Planning and Production departments in the manufacturing industry.

Integrated Design of a Product Family and Its Assembly System is also suitable
for use as a textbook in courses such as Computer-Aided Design, Concurrent
Engineering, Design for Assembly, Process Planning, and Integrated Design.
The book addresses the overall integrated design aspects of a space
transportation system involving several disciplines like propulsion, vehicle
structures, aerodynamics, flight mechanics, navigation, guidance and control
systems, stage auxiliary systems, thermal systems etc. and discusses the system
approach for design, trade off analysis, system life cycle considerations,
important aspects in mission management, the risk assessment, etc. There are
several books authored to describe the design aspects of various areas, viz.,
propulsion, aerodynamics, structures, control, etc., but there is no book which presents space transportation system (STS) design in an integrated manner. This book attempts to fill this gap by addressing systems approach for STS design, highlighting the integrated design aspects, interactions between various subsystems and interdependencies. The main focus is towards the complex integrated design to arrive at an optimum, robust and cost effective space transportation system. The orbital mechanics of satellites including different coordinate frames, orbital perturbations and orbital transfers are explained. For launching the satellites to meet specific mission requirements, viz., payload/orbit, design considerations, giving step by step procedure are briefed. The selection methodology for launch vehicle configuration, its optimum staging and the factors which influence the vehicle performance are summarized. The influence of external, internal and dynamic operating environments experienced by the vehicle subsystems and the remedial measures needed are highlighted. The mission design strategies and their influence on the vehicle design process are elaborated. The various critical aspects of STS subsystems like flight mechanics, propulsion, structures and materials, thermal systems, stage auxiliary systems, navigation, guidance and control and the interdependencies and interactions between them are covered. The design guidelines, complexity of the flight environment and the reentry dynamics for the reentry missions are included. The book is not targeted as a design tool for any particular discipline or subsystem. Some of the design related equations or expressions are not attempted to derive from the first principle as this is beyond the scope of this book. However, the important analytical expressions, graphs and sketches which are essential to provide in-depth understanding for the design process as well as to understand the interactions between different subsystems are appropriately included.

The Fully Updated, Indispensable Study of Sustainable Design Principles Fundamentals of Integrated Design for Sustainable Building is the first textbook to merge principles, theory, and practice into an integrated workflow. This book introduces the technologies and processes of sustainable design and shows how to incorporate sustainable concepts at every design stage. This comprehensive primer takes an active learning approach that keeps students engaged. This book dispenses essential information from practicing industry specialists to provide a comprehensive introduction to the future of design. This new second edition includes: Expansive knowledge—from history and philosophy to technology and practice Fully updated international codes, like the CAL code, and current legislations Thorough coverage of critical issues such as climate change, resiliency, health, and net zero energy building Extensive design problems, research exercise, study questions, team projects, and discussion questions that get students truly involved with the material Sustainable design is a responsible, forward-thinking method for building the best structure possible in the most efficient way. Conventional resources are depleting and building
professionals are thinking farther ahead. This means that sustainable design will eventually be the new standard and everyone in the field must be familiar with the concepts to stay relevant. Fundamentals of Integrated Design for Sustainable Building is the ideal primer, with complete coverage of the most up to date information.

Smart Evaluation and Integrated Design in Regional Development puts forward an alternative approach to evaluation in spatial planning - one that focuses on 'territory' and 'landscape'. The book introduces an innovative evaluation approach, namely Territorial Integrated Evaluation (TIE), a meta-evaluation methodology for designing regional development scenarios. A research team from the Politecnico di Torino applied this methodology experimentally to the practices of spatial planning in Trentino in order to aid the Province in a process of institutional innovation that is still going on today. TIE defines territorial scenarios serving the need for regional economic development as well as the conservation of nature and landscape. A cross-border region, Trentino has a special need to harmonize economic development with the exceptional and internationally renowned value of its landscape which includes the Dolomites, a UNESCO World Heritage Site. Therefore TIE set out to design regional development scenarios that integrated various topics - retail, tourism, infrastructures, nature and landscape. By testing out TIE in practice in this extraordinarily dynamic institutional context, the book makes a significant contribution to the discussion about newly emerging approaches to spatial planning that involve multidisciplinary vision, new paradigms in regional development, and institutional learning and capability in decision-making.

This book presents a selection of papers related to the fifth edition of book further to the International Conference on Integrated Design and Manufacturing in Mechanical Engineering. This Conference has been organized within the framework of the activities of the AIP-PRIMECA network whose main scientific field is Integrated Design applied to both Mechanical Engineering and Productics. This network is organized along the lines of a joint project: the evolution, in the field of training of Integrated Design in Mechanics and Productics, in quite close connection with the ever changing industrial needs over the past 20 years. It is in charge of promoting both exchanges of experience and know-how capitalisation. It has a paramount mission to fulfil, be it in the field of initial and continuous education, technological transfer and knowledge dissemination through strong links with research labs. For the second time, in fact, the IDMME Conference has been held abroad and, after Canada in 2000, the United Kingdom, more particularly Bath University, has been retained under the responsibility of Professor Alan Bramley, the Chairman of the Scientific Committee of the conference. The Scientific Committee members have selected all the lectures from complete papers, which is the guarantee for the Conference of quite an outstanding scientific level. After that, a new selection has been carried out to retain the best publications, which establish in a book, a state-of-the-art analysis.
as regards Integrated Design and Manufacturing in the discipline of Mechanical Engineering.

This book presents recent advances in the integration and the optimization of product design and manufacturing systems. The book is divided into three chapters corresponding to the following three main topics: - optimization of product design process (mechanical design process, mass customization, modeling the product representation, computer support for engineering design, support systems for tolerancing, simulation and optimization tools for structures and for mechanisms and robots), - optimization of manufacturing systems (multi-criteria optimization and fuzzy volumes, tooth path generation, machine-tools behavior, surface integrity and precision, process simulation), - methodological aspects of integrated design and manufacturing (solid modeling, collaborative tools and knowledge formalization, integrating product and process design and innovation, robust and reliable design, multi-agent approach in VR environment). The present book is of interest to engineers, researchers, academic staff, and postgraduate students interested in integrated design and manufacturing in mechanical engineering.

"The World's Greenest Buildings provides the first way to compare building performance, using cost and energy use data that has been verified by independent third parties and to understand how building performance can be upgraded. The book provides: an overview of the rating systems and shows "best in class" building performance in North America, Europe, the Middle East, India, China, Australia and the Asia-Pacific region practical examples of best practices for greening both new and existing buildings, useful for architects and engineers, contractors, building owners and managers, facility professionals, developers, lenders and investors, brokers and appraisers, and everyone charged with managing commercial and institutional buildings a response to the intense need for a practical reference for design professionals, building owners, developers and facility managers on how green buildings actually perform at the highest level, one that takes them step-by-step through many different design solutions. interviews with architects, engineers, building owners and developers and industry experts, to provide added insight into the greening process a complete guide to world-class green building performance primarily for new buildings, including corporate, commercial, educational, governmental and other large building types a welath of exemplary case studies of successful green building projects using actual performance data from which to learn a "recipe," based on others’ experiences, for delivering successful green building projects in the various countries profiled"--

This book addresses Integrated Design Engineering (IDE), which represents a further development of Integrated Product Development (IPD) into an interdisciplinary model for both a human-centred and holistic product development. The book covers the systematic use of integrated, interdisciplinary, holistic and computer-aided strategies, methods and tools for the development of products and services, taking into account the entire product lifecycle. Being applicable to various kinds of products (manufactured, software, services, etc.), it helps
readers to approach product development in a synthesised and integrated way. The book explains the basic principles of IDE and its practical application. IDEs usefulness has been demonstrated in case studies on actual industrial projects carried out by all book authors. A neutral methodology is supplied that allows the reader to choose the appropriate working practices and performance assessment techniques to develop their product quickly and efficiently. Given its manifold topics, the book offers a valuable reference guide for students in engineering, industrial design, economics and computer science, product developers and managers in industry, as well as industrial engineers and technicians.

The availability of cheaper, faster, and more reliable electronic components has stimulated important advances in computing and communication technologies. Theoretical and algorithmic approaches that address key issues in sensor networks, ad hoc wireless networks, and peer-to-peer networks play a central role in the development of emerging network technologies.

Find Practical Solutions to Civil Engineering Design and Cost Management Problems A guide to successfully designing, estimating, and scheduling a civil engineering project, Integrated Design and Cost Management for Civil Engineers shows how practicing professionals can design fit-for-use solutions within established time frames and reliable budgets. This text combines technical compliance with practical solutions in relation to cost planning, estimating, time, and cost control. It focuses on the integration of design and construction based on solid engineering foundations contained within a code of ethics, and navigates engineers through the complete process of project design, pricing, and tendering. Well illustrated The book uses cases studies to illustrate principles and processes. Although they center on Australasia and Southeast Asia, the principles are internationally relevant. The material details procedures that emphasize the correct quantification and planning of works, resulting in reliable cost and time predictions. It also works toward minimizing the risk of losing business through cost blowouts or losing profits through underestimation. This Text Details the Quest for Practical Solutions That: Are cost effective Can be completed within a reasonable timeline Conform to relevant quality controls Are framed within appropriate contract documents Satisfy ethical professional procedures, and Address the client’s brief through a structured approach to integrated design and cost management Designed to help civil engineers develop and apply a multitude of skill bases, Integrated Design and Cost Management for Civil Engineers can aid them in maintaining relevancy in appropriate design justifications, guide work tasks, control costs, and structure project timelines. The book is an ideal link between a civil engineering course and practice.

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

Completely up-to-date coverage of water treatment facility design and operation This Second Edition of Susumu Kawamura's landmark volume offers comprehensive coverage of water...
treatment facility design, from the basic principles to the latest innovations. It covers a broad spectrum of water treatment process designs in detail and offers clear guidelines on how to choose the unit, process, and equipment that will maximize overall efficiency and minimize maintenance costs. This book also explores many important operational issues that affect today's plant operators and facility designers. This new edition introduces several new subjects, including value engineering, watershed management, dissolved air flotation process, filtered reservoir (clearwell) design, and electrical system design. It provides expanded and updated coverage of objectives for finished water quality, instrumentation and control, disinfection process, ozonation, disinfection by-product control, the GAC process, and the membrane filtration process. Other important features of this Second Edition include: * Practical guidance on the design of every water treatment plant component * New information on plant layout, cost estimation, sedimentation issues, and more * English and SI units throughout * Help in designing for compliance with water treatment-related government regulations.

Supplemented with hundreds of illustrations, charts, and tables, Integrated Design and Operation of Water Treatment Facilities, Second Edition is an indispensable, hands-on resource for civil engineers and managers, whether working on new facilities or redesigning and rebuilding existing facilities.

"Fundamentals of Integrated Design for Sustainable Building offers an introduction to green building concepts as well as design approaches that reduce and can eventually eliminate the need for fossil fuel use in buildings while also conserving materials, maximizing their efficiency, protecting the indoor air from chemical intrusion, and reducing the introduction of toxic materials into the environment. It represents a necessary road map to the future designers, builders, and planners of a post-carbon world" --

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