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Science and technology

2010

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Recent publications

An introduction to Chemical Thermodynamics
G.J.M. Koper
2nd edition / 2008 / xii+200 pp. /
ISBN 978-90-6562-187-0 / € 16,50
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Analysis and Modelling of Physical Transport Phenomena
K. Hanjalic, S. Kenjeres, M.J. Tummers and H.J.J. Jonker
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ISBN 978-90-6562-165-8 7 / € 25.00
http://www.vssd.nl/hlf/c001.htm

Bamboo, a Sustainable Solution for Western Europe
Design Cases, LCAs and Land-use
Pablo van der Lugt, Joost Vogtländer, Han Brezet
2009, x + 135 pp. / paperback /
ISBN 978-90-6562-196-2 / € 16.00

Breakwaters and Closure Dams
H.J. Verhagen, K. d'Angremond, F.C. van Roode
2009 / /2nd ed. / xii + 392 pp. / hardback /
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Creative Facilitation
Marc Tasoul
2009 / 3rd edition / xii + 204 pp. / paperback /
ISBN 978-90-6562-200-6 / € 24.00
http://www.vssd.nl/hlf/b005.htm

Design Interventions for Stimulating Bamboo Commercialization
Dutch Design meets Bamboo as a Replicable Model
Pablo van der Lugt
2008 / xxii + 398 pp. / thesis / paperback /
ISBN 978-90-5155-047-4 / € 39,50
http://www.vssd.nl/hlf/m015.htm

Elements of airplane performance
G.J.J. Ruijgrok
2009 / x+368 pp. / 2nd ed. /
ISBN 978-90-6562-203-7 / hardback / € 29,50
http://www.vssd.nl/hlf/ae02.htm

Elements of aviation acoustics
G.J.J. Ruijgrok
2008 / x+352 pp. / paperback /
ISBN 978-90-6562-155-9 / € 22,50
http://www.vssd.nl/hlf/ae03.htm

From Plant to Products
Van Iterson Jr and useful plants in the Botanical Garden of Delft University of Technology
Pieter van Mourik and Gerard van der Veen
2008 / 1st edition / 152 pp. / including DVD Growing Solutions / ISBN 978-90-6562-177-1 /
paperback / full colour / € 19.50
http://www.vssd.nl/hlf/d009.htm

LCA-based assesment of sustainability: the ecocosts/value ratio EVR
Joost G. Vogtländer a.o.
2009 / xiv + 219 pp. / paperback /
ISBN 978-90-6562-233-4 / € 21.50
http://www.vssd.nl/hlf/b004.htm

Surrounded by physics
Robert F. Mudde
2008 / x + 189 pp. / paperback /
ISBN 978-90-6562-169-6 / € 21,50
http://www.vssd.nl/hlf/c003.htm

Towards a Sustainable Technological World
H.H. Kleizen
2007 / viii + 156 pp. / paperback /
ISBN 978-90-71301-93-3 / € 22,50
http://www.vssd.nl/hlf/b011.htm

Turning The Tide
Essays on Dutch ways with water
Henk L.F. Saeijs
2008 / x + 142 pp. / paperback / full colour /
ISBN 978-90-6562-168-9 / € 14.50
http://www.vssd.nl/hlf/f037.htm

Welding Technology
Gert den Ouden, Marcel Hermans
2009 / xii + 184 pp. / ISBN 978-90-6562-205-1 /
paperback / € 22,50
http://www.vssd.nl/hlf/m012.htm

Aerospace enigineering

Elements of aircraft pollution

G.J.J. Ruijgrok and D.M. van Paassen

2007 / x+407 pp. / ISBN 978-90-71301-71-1 / paperback / € 27,50

This book is an attempt to place the subject aircraft pollution in the context of aerospace engineering by bringing together the most relevant sciences and technologies, which cover the problem.

Although the total emissions from aircraft are very small compared to other manmade emissions from burning of fossil fuels, the impact on the environment may be important.

Water vapor and carbon dioxide are pertinent fractions of the amount of fuel burned, whereas other combustion products, such as carbon monoxide, unburned hydrocarbons, nitrogen oxides, and smoke or soot, depend upon the operating conditions of the aircraft.

The major concern seems the emission of nitrogen oxides at cruise altitudes, which substance may promote the enhanced greenhouse effect, photochemical smog formation, and also the depletion of the stratospheric ozone layer.

Doubtless, future reductions in environmental impact will require considerations on the effects of improved aerodynamics, propulsion efficiencies, flight techniques, aviation fuels, and combustion processes. At the same time, it is essential that we obtain accurate scientific evidence as a basis for international control of aircraft pollution and its effects.

The purpose of the book is to provide insight into the numerous topics involved in the problem of aircraft pollution. Therefore, when necessary and possible derivations and formulae are presented, but for an important part the book is highly descriptive.

The text originates from a MSc Aerospace Engineering course on airplane propulsion, noise, and pollutant emissions, given by the author at the Faculty of Aerospace Engineering of Delft University of Technology.

Contents: Preface • 1 introduction • 2 nature of the atmosphere • 3 standard atmospheres • 4 moist air • 5 solar energy • 6 environmental major concerns • 7 fundamentals of jet propulsion • 8 performance of turbofan and turbojet engines • 9 propeller propulsion • 10 pollutant emissions of aero-engines • 11 flight performance • 12 operation and design for low emissions • References • Index

http://www.vssd.nl/hlf/ae01.htm

Elements of airplane performance

G.J.J. Ruijgrok

2009 / x+368 pp. / 2nd ed. /
ISBN 978-90-6562-203-7 / hardback / € 29,50

This book contains sixteen chapters and four appendices which form a comprehensive teaching text on the subject of airplane performance. The first seven chapters are designed to provide necessary background material in mechanics, aerodynamics, atmospheric science, air data instruments, and propulsion. In addition, the appendices furnish basic data and information on the theory pertinent to a clear understanding of the different problems. Chapters 8-13, in particular, treat the point performance of the airplane, i.e., the performance that pertain to given point on the flight path. Finally, chapters 14-16 deal with what is known as the integral performance, indicating the performance items which are related to the course of the flight. The text is extensively illustrated and includes numerous worked examples. The book is primarily intended to serve as a textbook in undergraduate engineering courses and as an instrument for selfstudy.

Contents: Preface • 1. Basic concepts • 2. The atmosphere • 3. Equations of motion • 4. Aerodynamic basis • 5. Air data instruments • 6. Propulsion • 7. Propeller performance • 8. The airplane in symmetric flight • 9. Performance in steady symmetric flight • 10. Effect of altitude • 11. Flight and airplane condition effects • 12. Turning performance • 13. Gliding flight • 14. Symmetric climb and descent • 15. Cruise performance • 16. Airfield performance • References • Appendix A. Newtonian mechanics • Appendix B. Conversion factors • Appendix C. International standard atmosphere • Appendix D. One-dimensional steady flow equations • Index

http://www.vssd.nl/hlf/ae02.htm

Elements of aviation acoustics

G.J.J. Ruijgrok

2008 / x+352 pp. / ISBN 978-90-6562-155-9 / paperback / € 22,50

Quieting cabin and flight deck noise, and reducing the impact of noise on commununities near airports are matters of great importance to air-manufacturers and airline operators for already more than four decades.

Undoubtedly, knowledge of both aeronautics and acoustics is essential for a clear understanding of any aviation noise problem. Such understandmg is a necessary prerequisite to the control of interior and exterior noise.

In view of the importance of education in dealing with noise control, this book is devoted to the branch of aerospace engineering known as aviation acoustics. The book contains twelve chapters and three appendixes which originate from an annual course on airplane noise given by the author to aerospace engineering students at Delft University of Technology. The book is intended to be useful to undergraduate students of aerospace engineering, and also to researchers and practicing engineers who wish to revive their understanding of the topic.

The text assumes litde or no previous knowledge of acoustics.

Contents: Preface • 1. Basic facts • 2. Dynamics of sound waves • 3. Elementary sources • 4. Propagation of sound in the atmosphere • 5. Sound in enclosures • 6. Attenuation of sound in

ducts • 7. Frequency spectra • 8. Ground reflection • 9. Noise measures • 10. Noise certification • 11. Effects of forward motion • 12. Airplane noise sources • References • Appendix A. Noy values • Appendix B. Si-units • Appendix C. Noise zoning in the netherlands • Appendix D. Lateral noise attenuation • Appendix E. Noise abatement procedures • Appendix F. Glossary • Index
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Architecture, town planning

Building in the stubborn city

Paul Meurs

2008 / 91 pp. / paperback / full colour, bilingual
ISBN 978-90-6562-182-5 / € 13.50

The shift from construction projects at the edge of cities to projects inside cities, surrounded by existing buildings, forces designers not only to study the past, but also to decide on their position towards it. In recent years, cultural history has become a broad concept. Potentially, the care of monuments relates to almost anything which has ever been built. Consequently, there are virtually no architectonic projects in the Netherlands which do not include a cultural history component.

Avoiding radical urban renewal and instead opting for transformation results in attractive historical layers. In each assignment, a designer has to strike a new balance between the existing and new qualities. The creative challenge of incorporating cultural history in the development of integrated plans is key to 'building in the stubborn city'. How cultural history can provide clear frameworks for transformation processes is discussed in a second essay on intervention and restoration: 'restoration without dogma'.

Contents:
Building in the stubborn city
07 Introduction
11 Cultural history
13 Does nothing change?
16 Everything different
33 Modern with tradition
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Restoration without dogma
53 Guidelines - from general to specific
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88 From generic to specific principles
91 Notes
http://www.vssd.nl/hlf/f038.htm

Controlling Cost and Quality *in the Early Phases of the Accommodation Process*

C. Gerritse

2008 / viii + 120 pp. / paperback, full color /
ISBN 978-90-6562-159-7 / € 17.50

In recent years, the Faculty of Architecture at TU Delft has been conducting research aimed at improving its knowledge of the cost-quality relationship. Such knowledge could be harnessed in the process of creating and using buildings. The focus is on the early stages of the process in which schedules of requirements and budgets are fixed, mass studies carried out and the first design sketches prepared. The PARAP working group has taken the knowledge and insights obtained, and rendered them operational in the development of cost-quality modelling, which enables budgets to be fixed on the basis of the performance demanded. It also enables processes to be directed on the basis of cost and quality.

The author, who is a member of the PARAP working group, has carried out cost-quality studies. The present book shows how the results of these studies are interrelated. This provides a solid understanding of the way in which the cost-quality relationship is modelled and directed during the preliminary - strongly determinative - phases of the accomodation process.

The findings are presented in a visual and accessible way. The result is a book that is both practical and easily readable. It is suitable for the students of Architecture programmes, policy makers, construction cost experts, and managers in everyday practice.

Contents: Preface • 1 Introduction • 2 Costs and quality • 3 The accomodation cycle • 4 Cost and quality control • 5 Required space • 6 Stacking • 7 Grain size • 8 Internal space • 9 Cost/quality modelling • 10 Epilogue • 11 Literature and other sources
http://www.vssd.nl/hlf/b013.htm

The art of blending

Jo Coenen

2007 / 80 pp. / ISBN-13 978-90-71301-79-7 / full color, bilingual / € 13.50

Jo Coenen concludes that during the past few decades we have been subjected to an unprecedented dynamic process of social and cultural change due to such factors as digitalisation, globalisation, commercialisation, individualisation, and the like. This is associated with an enormous need for novelty and at the same time with a strong need for security and the growth of organisations dedicated to the preservation of our heritage. These two trends of dynamic change and conservation collide violently with one another, while if they worked together they could produce magnificent results. It is important to think in terms of both transformation and continuity; to think about the existing and of ways to graft strains successfully on to it.

The ®MIT research programme, with Jo Coenen as scientific director, stands at the epicenter of the current debate in architecture and construction. The transformation of existing buildings now accounts for around two thirds of architectural activities, from the renovation of private dwellings up to complex assignments with regard to

integral city renewal. The fundamental change of the set of assignments of the architect and the growing complexity of the professional practice require a new form of engineer's art: the art of blending.

Contents

http://www.vssd.nl/hlf/f020.htm

Discovering the assignment
Redevelopment in practice

Job Roos

2007 / 203 pp. / ISBN 978-90-6562-158-0 / full color, bilingual / € 29.50

In Discovering the Assignment an inspiring elucidation of architectonic redevelopment is combined with a profound analysis of practical examples, a description of the most important parties that play a role in the design process and recommendations for both practice and education.

Emphasis is placed on the need to devote attention not only to the economic and ecological reasons for redevelopment, but also to the intangible values of the built heritage. Great effort must be invested in sensitivity and in the poetic aspects of this field of study. Inspiration and argumentation are indispensable when designing for the existing. The way that inspiration can serve as a guide for the design is, in addition to the practical examples, envisaged and described in a model of thought, 'the Spiral'.

Contents

http://www.vssd.nl/hlf/f034.htm

Beyond restoration

Rob van Hees

2007 / 35 pp. / full color, bilingual /
ISBN 978-90-6562-161-0 / € 6.50 / o.o.s.

This publication is based on the lecture given by Rob van Hees when he accepted the chair in building conservation at the Faculty of Architecture of Delft University of Technology. He addresses the objectives associated with the chair in building conservation: promoting the development of expertise by research on diagnostic and conservation methods, and transferring that expertise to professional practice. The overall objective is to improve the quality and durability of restorations and preserve our architectural heritage.

The chair in building conservation approaches restoration on the basis of the properties of the historic materials. This is because restoration is developing from a process governed by art history and architecture to one supported by science. The emphasis on lasting restoration is growing, and an interesting tension is developing where engineering and ethics meet.

Van Hees concludes that avoidable mistakes are made throughout the restoration process, from the architect through to the contractor. These mistakes then require further restoration and unnecessarily early replacement of materials. The restoration and conservation of historic buildings and research into this field are specialist areas and demand more careful and detailed investigation than in other areas of the construction industry. All those involved in restoration tend not to learn enough from past interventions. The issue is not only 'conserving to learn about the past, and learning about the past, to conserve', but also 'learning from our interventions, to learn how to intervene': we have to look beyond restoration.

http://www.vssd.nl/hlf/f035.htm

Biomechanical engineering

Upper Extremity Prosthetics
Current status & evaluation

Dick H. Plettenburg

2006 / viii + 133 pp. / ISBN 978-90-71301-75-9 / paperback / € 21.50

A wide variety of prostheses and prosthetic components is available for someone with an arm defect. This book presents the current state of the art: the different types of prostheses contemporarily available, their means of control and their sources of power. The actual use of prostheses is investigated. In general the use of prostheses is cumbersome. The reasons for this are explored. Also some basic requirements needed to achieve better prostheses are presented.

This book provides an overview of the current state of the art in upper extremity prosthetics for anyone interested in this field: i.e. students and professionals in areas like biomedical engineering, physical medicine, rehabilitation medicine, physical therapy, occupational therapy, and rehabilitation technique.

Contents: Preface • 1 prostheses in historical perspective • 2 current status in upper extremity prosthetics • 3 evaluation • 4 discussion, conclusions, and recommendations • References • Sources of illustrations • Index

http://www.vssd.nl/hlf/m011.htm

Business engineering, economics and innovation

Creative Facilitation

Marc Tassoul

2009 / 3rd edition / xii+204 pp. / paperback /
ISBN 978-90-6562-200-6 / € 24,00

A question which regularly appears at dinner conversations is: 'Can one learn to be creative?' In the author's view, the question is similar to questions such as 'Can one learn to eat?' and 'Can one learn to breathe?' We all do it, but one can specialise oneself, one can learn to make delicious Japanese sushi's, or some heavenly Genovese pesto, or you practice yoga or scuba-diving and learn to breathe more efficiently. The same can be said about creativity: everyone is creative, but it can be practiced, enhanced and sharpened to lead to much more richness and quality.

Learning to become creative really happens through experience, by looking at other people practicing creative tasks, by trying recipes oneself, by finding out what works and what doesn't, and last but not least, by discovering oneself in the context of creative tasks. So the answer is 'yes, one can learn to be creative', but, like eating and breathing, we all do it already.

Contents

http://www.vssd.nl/hlf/b005.htm

Fundamentals of Business Engineering and Management

A systems approach to people and organisations

W. Ten Haaf, H. Bikker, D.J. Adriaanse
with contributions from J. in 't Veld and P.Ch-A. Malotaux

2002 / xvi + 728 pp. / ISBN 978-90-407-2210-3 /
hardback / € 50.50

The approach to management problems introduced in this book is known as the "Delft School of Business Engineering and Management" approach. It is a school of thought that is well known in the Netherlands and which has proved to be successful. Outside the Netherlands interest in this approach is also increasing.

This Delft method has been developed at the renowned University of Technology in Delft. When summarised the method may be characterised in the following main ways:

Business means: service provided for people, by people

With the analysis and therapy attached to organisation problems it is best for one to look at processes and to describe those processes according to the systems and model approach

An interdisciplinary approach is what best suits modern, complex problems of leadership and organisation

This book has in the first place been written to help up and coming managers, students still in training or managers with a technological background to orient themselves to the way in which companies and institutions operate. The book is also of interest to colleagues with different backgrounds who are interested in adopting a systematic approach to management problems.

Contents Preliminaries

http://www.vssd.nl/hlf/b001.htm

LCA-based assesment of sustainability: the ecocosts/value ratio EVR

Joost G. Vogtländer a.o.

2009 / xiv + 219 pp. / paperback /
ISBN 978-90-6562-233-4 / € 21.50

From: 'our common future', G.H. Brundtland: 'The downward spiral of poverty and environmental degradation is a waste of opportunities and of resources. In particular it is a waste of human resources. These links between poverty, inequality, and environmental degradation formed a major theme in our analysis and recommendations. What is needed now is a new era of economic growth - growth that is forceful and at the same time socially and environmentally sustainable.'

The key to such a better economy is the development of products and services which create more value and have a better eco-efficiency as well.

The model of the Eco-costs/Value Ratio is an indispensable decision support tool for architects, designers, engineers and business managers. The model is LCA based, and enables cradle to cradle design. The model features an innovative approach to the issue of a single indicator in LCA, being the so called eco-costs. The

calculation is transparent and relative simple and requires no weighting steps. Since the eco-costs system is a monetary system, comparisons and analyses are possible in combination of the market value (the fair price).
This book is a compilation of the original publications on the subject. For the convenience of the reader, all tables and other data have been updated with the new eco-costs 2007 dataset.
Contents: 1. Introduction • 2. The virtual pollution prevention costs • 3. The eco-costs and the EVR • 4. Recycling and Cradle to Cradle • 5. Eco-efficient value creation • 6. Land-use 7. Communication • 8. Road transport of consumer goods 9. Recycling of building materials • 10 Appendices • References • Summary • List of figures and tables • Index
http://www.vssd.nl/hlf/b004.htm

Macroeconomics

James K. Galbraith and William Darity, Jr.
2005 / xxii+505 p. / ISBN 978-90-71301-57-5 / € 26.50
In the late 1990s, the United States achieved an economist's dream. Unemployment was below four percent of the labor force for three years in a row. Jobs were plentiful, and job markets were tight. Growth was strong, the stock market was extremely high. And yet there was no increase in the rate of inflation. Moreover the federal budget went into surplus, with tax revenues exceeding public expenditure for the first time in thirty years. Since that happy moment, dark times have come again, with a recession in 2001, accompanied by lost jobs and rising unemployment and punctuated - though not caused - by terrorist attacks on New York and Washington on September 11, 2001. There followed two years of near-stagnation, with recovery resuming only in mid-2003. But now, as we write in the fall of 2005, the U.S. economy is again growing, and the unemployment rate is stable near five percent. Still the economy has problems that worry many. Budget deficits have returned. Trade deficits are exceptionally high. Interest rates are rising. The dollar has been sliding against the new mega-currency across the Atlantic, the euro.
Meanwhile in Europe, a debate rages over the future of the great project of European Union. Europe is racked by high rates of joblessness, especially among the young. Many European leaders - fortified by the advice of many economists - are determined to make their labor markets more "flexible," to better follow what they believe to be the "American model." In most cases, this means adjusting wages so that workers with low skills receive less pay and enjoy fewer social protections.
In this way, Europe's leaders claim to hope to make such workers more attractive to hire, and so reduce unemployment. But European electorates are unhappy and distrustful. The French and the Dutch have even voted to reject the European Constitution, largely from fear that the new Europe would weaken the role of national governments in the social sphere. Globalization, privatization, deregulation and competition are turbulent and troublesome forces, and it is perhaps not surprising that many would prefer to keep them at bay. But beyond this, it appears that many ordinary Europeans simply do not believe that the solution to unemployment lies in cutting wages. None of this is new. Ever since the 1930s, the question of whether and how the government should take an active role to fight unemployment, to promote economic expansion, and to protect the living standards of working people has been hotly debated. The lines of argument are broadly the same now, though with variations and innovations, as they were then. The divisions and disagreements are broadly the same. It is mainly the circumstances, the facts, and the personalities that have changed.
Employment, growth, inflation, interest rates, deficits, exchange rates and globalization are the substance of modern macroeconomics. You have no doubt encountered all of these words before. But what do they mean? How do they interact? What are the chains of cause and effect between policy instruments, like the interest rate, and policy outcomes, such as unemployment? If you are new to this subject, very likely you have no clear idea. That is about to change when you study this book.
Contents
Part 1 The Macroeconomic Revolution • 1 Revolution And Counterrevolution • 2 Employment And Unemployment • 3 Interest, Money And Uncertainty
Part 2 The Keynesian Theory • 4 Classical And Keynesian Macroeconomic Models • 5 The Is-Lm Model And The Phillips Curve
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Towards a Sustainable Technological World

H.H. Kleizen
2007 / viii + 156 pp. / paperback /
ISBN 978-90-71301-93-3 / € 22,50
This book is about global limitations and local solutions found by local societies. A Sustainable Technological World is defined in balance with the other great mass and energy streams in the geosphere and biosphere and in balance within the position of mankind in the biosphere.
The local societies are characterized in terms of population size and cultural dimensions and these interlinked properties give rise to socio-diversity. Sociodiversity and in its wake different appreciation of artifacts are a prerequisite for finding the pathway to sustainable development on a global scale.

This book is written top-down and in line with this kind of thinking
Contents: Preface • 1 Introduction • 2 Back Casting World Spheres • 3 A Sustainable Technological World • 4 Artifacts Design • 5 Life Cycles Artifacts • 6 Learning Societies • 7 Towards • Appendix. Society Data • Index
http://www.vssd.nl/hlf/b011.htm

Civil engineering, coastal engineering

Breakwaters and closure dams
K. d'Angremond en F.C. van Roode
2009 / 2nd edition / xii+392 pp. / hardback /
ISBN 978-90-6562-173-3 / € 39.50
[paperback ISBN 978-90-6562-197-9]
Breakwaters and closure dams belong to the most spectacular hydraulic structures. They are exposed to the most severe loading by waves and currents, either during their construction, or during their life cycle.
Design and construction of these structures are that much inter-related that a proper understanding is not possible without a thorough knowledge of theory and a proper understanding of practical matters.
This book attempts to offer this combination to the graduate student. It starts with a description of the functional requirements, it discusses the relevant theory and shows the application of experience and theoretical knowledge to the design.
Contents: Introduction • Positioning the subject • The design process • Considerations at system level • Use of theory • Data collection • Stability of random placed rock mounds • Dynamic stability • Stability of monolithic breakwaters • Wave-structure interaction • Design practice of breakwater cross-sections • Design practice for closure dams • Construction methods for granular material • Construction methods for monolithic structures • Failure modes and optimization • Flow development in closure gaps • Review • Appendices.
http://www.vssd.nl/hlf/f011.htm

Ebb and Flood Channel Systems in the Netherlands Tidal Waters
ENGLISH TRANSLATION OF THE ORIGINAL DUTCH TEXT WITH ANNOTATIONS
Johan van Veen
Introduced, annotated and translated by Hans Bonekamp, Edwin Elias, Anneke Hibma, Co van de Kreeke, Mattijs van Ledden, Dano Roelvink, Henk Schuttelaars, Huib de Vriend, Zheng-Bin Wang, Ad van der Spek, Marcel Stive and Tjerk Zitman.
2002 / 32 p. / ISBN 978-90-407-2338-4 / € 6.50
http://www.vssd.nl/hlf/f015.htm

Introduction to Bed, Bank and Shore Protection
Engineering the interface of soil and water
Gerrit J. Schiereck
2004 / xii+ 400 pp. / ISBN 978-90-407-1683-6 / hardback / € 42.50
The interface of land and water has always played an important role in human activities. Settlements are often located at coasts, river-banks or deltas. Harbours, waterways, dikes, dunes and beaches, structures for water-control and water-resources management etc. are examples of hydraulic engineering on a macro-scale. In this book, the interface is studied on a micro-scale. The occurring phenomena are important in all branches of hydraulic engineering.
In a natural situation, the interface moves freely with the forces of erosion and sedimentation. Actually, nothing is wrong with erosion, until some interest is threatened. Erosion is somewhat like weed: as long as it is in nobodies way, no action is needed or even wanted. There should always be a balance between the efforts of protection against erosion and the damage that would occur otherwise.
Moreover, it should be realised that once a location is protected along a coast or riverbank that is eroded on a large scale, the protected part can induce extra erosion and in the end the whole coast or bank has to be protected. So, look before you leap, should be the motto.
In many cases however, a protection is necessary: bottom protection behind outlet structures or around objects, revetments in rivers and canals, dike protection, coastal defence works etc.
Contents: Introduction • Flow - Loads • Flow-Stability Flow - Erosion • Porous Flow - General • Porous Flow - Filters • Waves - Loads • Waves - Erosion and stability • Ships • Proteetions • Construction and maintenance • Design • Appendix A: Materials • Appendix B: Environmental aspects • Appendix C: Cases.
http://www.vssd.nl/hlf/f007.htm

Principles of River Engineering
The non-tidal alluvial river
P.Ph. Jansen (ed.)
1994 / XVI+509 pp. / A4 /
ISBN 978-90-407-1280-7 / € 37.50
This book is intended both for the practising river engineer who, with its help, will be able to tackle problems giving all aspects the correct weights - without overlooking any of these aspects - and for the post-graduate student.
The book is divided in five parts. The first part presents a general introduction to river engineering. The next three parts deal with the basic subjects of river hydraulics, river surveys and river models. The final part deals with their applications. It should be stressed that most benefit will be obtained by studying the book as a whole, not just turning a particular section.
Extensive use has been made of research work

published by experts in many countries.
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Soil Mechanics

A. Verruijt, revised by S. van Baars
2007 / xii+346 p. / ISBN 978-90-6562-058-3 / paperback / € 27.50
This book - a translation and update of the Durch version - is part of the introductory course of Soil Mechanics in the Department of Civil Engineering of the Delft University of Technology. It contains an introduction into the major principles and methods of soil mechanics, such as the analysis of stresses, deformations, and stability. The most important methods of determining soil parameters, in the laboratory and in situ, are also described. Some basic principles of applied mechanics that are frequently used are presented in Appendices. The subdivision into chapters is such that one chapter can be treated in a single lecture of 45 minutes, approximately.
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The Vertical Motion of Foundations and Pontoons

Godfried Kruijtzer
2002 / 49 pp. / ISBN 978-90-71301-66-3 / € 6.50
This text collects the papers 'Vertical Vibration of Rigid Bodies on Deep Elastic Strata' and 'A Stoneley-Gibson-Varga Elastic Stratum' that have been published in the journal Heron (Volume 46, no. 1 (2001)).
The first chapter offers a survey of the vertical motion of rigid bodies resting on deep elastic strata. Four strata are distinguished:

- deep water,
- the homogeneous isotropic elastic half-space,
- the water saturated homogeneous isotropic porous elastic half-space and
- the Gibson half-space.

Four types of footings are considered: the strip, the circular disk and the embedded semi-cylinder and hemi-sphere.
In particular attention has been given to the distinction between compressible and incompressible strata, and to the distinction between low and high frequency factors of the oscillatory motion.
The second chapter provides a geometrically non-linear generalization of the Gibson soil. Some remarkable solutions concerning excavations and indented rigid punches are presented.The results provide a first approximation of the behaviour of foundations on real soils in the case of small soil strains.
http://www.vssd.nl/hlf/f016.htm

Turning The Tide

Essays on Dutch ways with water
Henk L.F. Saeijs
2008 / x + 142 pp. / paperback / full colour / ISBN 978-90-6562-168-9 / € 14.50
Dr Henk Saeijs is the spiritual father and driving force behind the modernization and "ecologization" of watermanagement in the Netherlands that took place in the last decades of the 20th century until now. In these essays he presents his experiences and views. Many themes are being dealt with in a challenging way. Myths and beliefs that politicians and the general public have on for example salt water as undesirable, reclaiming land, safety and sea defenses, fresh water and others, are thoroughly being debunked. In stead of technology-driven solutions Saeijs advocates the power and flexibility of Mother Nature, because after all "she

has over 3 billion years of experience". All too often the
downside of technical solutions are neglected or underestimated; only much later the (unpaid) bill comes along for untold quantities of polluted mud, the diminished biological production of estuaries and so on. Fortunately, there are positive trends emerging, especially where scientists and engineers try to use and respect the resilience of ecosystems.
Turning the Tide is a stimulating collection of essays for anyone who is interested in water and water management, certainly not only in The Netherlands with its interesting coastal structure and its polders op to 7 meters below sea level, but even more so in a global context.
Contents Preface • 1 Water, blessed and cursed • 2 From "ego-pragmatism" to "ecopragmatism" • 3 The Rijn: there's more to it than meets the boats • 4 Polders, keep them or kill them? • 5 Problems with a rain river • 6 Is the sea worth its salt? • 7 The delta: from excavation to well of knowledge • 8 Being creative in a changing delta • 9 Hidden assets • 10 Back to mother nature • 11 A water crisis casts its shadow • 12 Change of course • 13 Living with dams • 14 Eco-man • 15 Imaginable risks • 16 Innovating safety • 17 Is our delta an alma mater? • Literature • Index
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Chemical and physical engineering

Analysis and Modelling of Physical Transport Phenomena

K. Hanjalić S. Kenjereš, M.J. Tummers and H.J.J. Jonker
2007 / xii + 237 pp. / paperback /
ISBN 978-90-6562-165-8 / € 25.00
These lecture notes contain the material of the course Advanced Physical Transport Phenomena, offered in the Master's programme in Applied Physics at Delft University of Technology. The book aims at providing graduate students with an overview of analytical, numerical and modelling methods for solving problems of heat and fluid flow, following a unified and comparative approach.
The material is divided into four parts. Part I overviews the conservation laws for mass, momentum and energy in differential forms and the relevant constitutive relations. Part II covers analytical methods for solving generic problems of heat, mass and momentum transfer, aimed at providing insight into the physics, as well as to encourage students to master the analytical tools for gaining a physical intuition by solving problems in idealized situations. Part III introduces numerical methods for computer-aided solutions of complex problems that are not tractable by analytical approaches. It is, in fact, an introduction into computational fluid dynamics, heat and mass transfer (CFD, CHMT). Part IV deals with turbulent convection. Basic notions on turbulence relevant to its modelling are presented, followed by similarity and scaling analysis of generic wall-bounded flows, the basics of turbulence modelling and an overview of popular models, their physical rationale, interpretation and limitations.
Contents: Preface | Part I Fundamental Equations | 1 Fundamental Equations of Transport Phenomena - Field description | Part II Analytical Methods | 2 Analytical Methods | 3 Transport in Stagnant Media | 4 Momentum Transport | 5 Transport in Flowing Media | Part III Numerical Methods | 6 Numerical Heat and Fluid Flow | Part IV Turbulence and Transport Phenomena | 7 Turbulence: Some Features and Rationale for Modelling | 8 Description and Prediction of Turbulent Transport Phenomena | 9 Turbulence Models for RANS
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http://www.vssd.nl/hlf/c001.htm

An introduction to Chemical Thermodynamics

G.J.M. Koper
2nd edition / 2008 / xii+200 pp. /
ISBN 978-90-6562-187-0 / € 16,50
This book is aimed at students in the fields of molecular or life science and technology. It introduces thermodynamics as a predictive tool and discusses the spontaneity of chemical reactions and the power that can be obtained from fuel cells.
The emphasis of the first part is on applications of the Second Law of Thermodynamics on (bio)chemical processes and the Gibbs energy is introduced as the predictive quantity. The First Law of Thermodynamics is introduced merely to manage the energy resources. The last chapter of the first part deals with the efficiency of processes where the role of entropy is discovered.
The second part is devoted to chemical and physical equilibria. The various relations that exist for equilibria are exposed as universally related to the Gibbs energy. Ideal mixing relations and ideal solution relations are constantly being used as a simplified approach to the real situation. In the last chapter of this part, the deviations from ideality are assessed and the magnitude of the fugacity and activity coefficients is critically discussed.
The book is also aimed at chemical engineering students. These need to know more about processes and their efficiencies. Therefore the third part of the book is devoted to distributed processes. In the first chapter some important aspects of formal thermodynamics are discussed, in particular the role of entropy to identify equilibrium and stability. The second chapter of this part continues this discussion and introduces the concept of internal entropy production. To discuss these two issues, systems are subdivided into two parts that are not necessarily in equilibrium: the system is inhomogeneous. The last chapter of this part explains how fully inhomogeneous and flowing systems can be dealt with and how entropy production can be managed.

The fourth - and new - part of the book contains applications to macromolecular systems where solution properties, binding phenomena and membranes are discussed. This part has been added to provide material for a more advanced course. The topics dealt with in these chapters are relatively modern and appropriate references to the relevant literature are made. The author has tried to present this material from a few unifying concepts so as to demonstrate the analogy between the various treatments in the current literature. Also, the relation to colloid science - even though dealing more with particles than with macromolecules - is discussed.

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An Introduction to Interfacial Engineering

G.J.M. Koper

2007 / x + 100 pp. / ISBN 978-90-71301-95-7 /
€ 9.00

This book aims to introduce the main concepts of colloid science and to demonstrate its use in technology. The contents of the book can be roughly divided into two parts.

The first part contains the basic knowledge required to deal with colloidal systems. Chapter 1 introduces some key aspects of colloidal systems such as osmotic pressure, Brownian motion and the Tyndall effect and discusses some applications. Chapter 2 presents the Five Laws of Interfacial Engineering that control colloidal behavior under various conditions. The chapter 3 deals with amphiphilic systems and their assemblies such as emulsions and microemulsions. Chapter 4 summarizes the main results of the vast amount of information available on colloidal stability and chapter 5 covers aspects of rheology relevant to colloidal systems. With these chapters, there is a bundle of worked exercises, taken from the author's own experience and from other textbooks, that is available upon request from the author.

The second part, consisting of the chapters 6 - 8, deal with technological applications such as emulsification, film formation and flotation. In these last chapters some new fundamental issues are discussed where necessary but the emphasis is on the application. These topics are selected such as to emphasize the role of colloid science and and sufficiently general to act as a template for other technological applications.

Contents

http://www.vssd.nl/hlf/d007.htm

Mass Transfer in Multicomponent Mixtures

J.A. Wesselingh and R. Krishna

2006 / 329 pp. / ISBN 978-90-71301-58-2 /
€ 32.50 / access to auxiliary files.

This is a book for chemical engineers. It allows the engineer to calculate how rapidly components in a mixture move with respect to each other. This is important in the designing of equipment such as reactors and separation units. The method covers both traditional and modern equipment, including catalytic and membrane processes.

The method is based on a force balance of each species in the mixture. (This in contrast to the Fick equation normally used). It can handle any number of components and considers forces due to gradients of concentration; and of electrical, pressure, centrifugal and other fields. It leads to a unified description of all mass transfer processes: distillation, absorption, electrodialysis, heterogeneous catalysis, chromatography, ultrafiltration and many others. Accompanying files contain about one hundred worked examples, many of them as live computer models.

Contents:

http://www.vssd.nl/hlf/d004.htm

Surrounded by physics

Robert F. Mudde

2008 / x + 189 pp. / paperback /
ISBN 978-90-6562-169-6 / € 21,50

This book is the result of a series of lectures that the author gave during a number of years to fi rst year students in Applied Physics at Delft University of Technology. The idea for such a course started from discussions with our students. They made a plea for an extra physics course in the fi rst year to get a better balance in the math and physics courses. Their wish was granted and the author was asked to prepair a series of lectures with as theme 'Physics of Daily Life'. This idea was of course inspired by the series of books that Prof. Dr. M. Minnaert wrote in the 30s of the 20th century. It should not be a course, that deals with only one of the main theories of physics. On the contrary, the idea was rather to stroll along all kinds of more or less familiar phenomena. By touching on these phenomena, different parts of physics and the accompanying theory would be discussed with the students. Being exposed to phenomena and open questions and being encouraged to think as a physicist was more important than providing the theoretical background along the traditional lines of the sub-disciplines and theories of physics.

Various aspects from daily life were chosen for the examples. For instance: what is the thickness of our atmosphere and can we make an estimate based on common knowledge? Or, what is the temperature of the earth without the greenhouse effect? Many more examples were in subsequent years discussed. They are taken from the visible phenomena in the atmosphere, from sound, from the kitchen or from sports, to name a few. In the book they are grouped in six chapters.

Contents Preface • 1. Elephant ears, dolphins and the balance equation • 2. The sky has a limit • 3. The sound in a cup of coffee • 4. Flowing water and air • 5. Cooking, boiling, heating • 6. Mechanics at work • Bibliography • Index.

http://www.vssd.nl/hlf/c003.htm

Transport Phenomena Data Companion

L.P.B.M. Janssen and
M.M.C.G. Warmoeskerken

2006 / 158 pp. / ISBN 978-90-71301-59-9 /
hardback / € 18.25.50

Many of the data needed for calculations in chemical engineering are dispersed over the literature. Moreover, various systems of units are used, often forcing the user to perform tedious conversions before a 'quick' calculation can be started. In this companion the authors have compiled those data that, according to their experience, are used frequently in transport phenomena and related subjects and, since all data are in S.I. units, rapid access to various calculations is facilitated.

This book is of course no substitute for a complete literature survey and no compendium on all data available in literature. On many occasions a selection had to be made from a multitude of expressions. For instance, for the mass transfer to bubbles, drops and particles, dozens of correlations are available. In those cases the most general correlation or the expression most commonly used has been chosen.

This companion consists of four parts. The first part is general and gives information varying from the Greek alphabet to calibration curves for thermocouples and pH ranges of indicators.

The second part consists of frequently used mathematics. In addition to general mathematical techniques, a selection of vectorial and tensorial calculus relevant to hydrodynamics and elementary rheology has been added.

The third part is a compendium of the transport phenomena. A systematic arrangement facilitates its use. The figures are in such a form that easy reading and accuracy are combined.

In the final part various material properties are given. Special attention has been paid to the most commonly used materials: air and water, but also frequently used materials like for instance hydrocarbons, foods and others are included.

For easy access to the data an extensive index is very important, so, special attention has been given to make the index as complete as possible.

http://www.vssd.nl/hlf/c017.htm

Electronics, physics

Design of High-performance Negative-feedback Amplifiers

E.H. Nordholt

2001 / xvi+234 pp. / ISBN 978-90-407-1247-0 /
€ 21.50

Amplifier design is very often regarded as making a selection from the large arsenal of known amplifier circuits and then adapting it for a specific purpose, possibly with the aid of computer-aided-design programs. Now and then designers are surprised by the introduction of a new amplifier circuit performing better in some respects than the others.

Each aspiring designer has to find his own way in this jungle. He has to choose from a rather chaotic and scattered collection of amplifier circuits rather than apply a systematic and straightforward design sequence that enables him to design his special-purpose amplifier circuit. A great deal of experience is essential.

This work is an attempt to make a useful contribution to the extensive literature on the subject of amplifier design. It can be justified on the grounds that the approach is believed to be unique in a number of respects. Many works that promise to cover the subject are instead concerned with analysis. Moreover, they frequently deal specifically or separately with particular design aspects, characterised by descriptions such as ‘wide-band’, ‘low-noise’, ‘low-distortion’, etc.

A treatment of the various design aspects and

their interconnections, however, is necessary for fruitful amplifier design. At the basis of such a treatment lies the observation — usually easily overlooked — that amplifier design is concerned in the first place with obtaining an adequate quality of information transfer. Amplifiers are more than electronic circuits merely bringing the source power up to a higher level.
Quality requirements are imposed on the signal transfer relative to the type of information and to the manner of perception, registration, or processing. The quality of information transfer is determined by a large number of quality aspects such as linearity, accuracy, efficiency, signal-to-noise ratio, etc. Unfortunately, it cannot be expressed as a quantitative figure of merit.
A systematic, straightforward design approach is presented in this work. Preference was given to a qualitative rather than to a quantitative approach.
Finding the proper configurations for the basic amplifier and of the amplifier stages is considered of primary importance and is emphasised here. This book is therefore largely concerned with the design phase preceding the phase in which existing computer aids can be helpful.
Contents: Basic Amplifier Configurations for Optimum Transfer of Information from Signal Sources to Loads • A Classification and some Properties of Configurations with one Active Device • Design Considerations for Optimum Noise Performance of Negative-Feedback Amplifiers • Design Considerations Regarding Optimum Accuracy and Linearity of Negative Feedback Amplifiers • Design Considerations Regarding Optimum High-Frequency Performance of Negative-Feedback Amplifiers • The Design of Bias Circuitry • Outline of the Design Method • Appendix: Influence of the Induced Gate Noise in Wide-Band Amplifiers.
http://www.vssd.nl/hlf/e022.htm

Electronic Instrumentation

P.P.L. Regtien
2005 / xiv + 397 pp. / ISBN 978-90-71301-43-8 / hardback / € 35.00
Electronic systems have made deep inroads into every aspect of daily life. One need only look around homes, offices and industrial plants to see that they feature almost everywhere. Indeed, it is practically impossible to name any appliances, tools or instruments that do not contain electronic components. In order to compete with rival companies or just remain a step ahead of them, the designers of technical systems and innovative products must be fully aware of both the assets and the limitations of electronic components and systems. Users of electronic systems also need to have a basic knowledge of electronic principles. In order to fully exploit an instrument's potential, to be aware of its limitations, to correctly interpret the measurement results and to be able to arrive at well-balanced decisions relating to the purchasing, repairing, expansion or replacement of electronic equipment, all users of such systems also need to have a basic knowledge of electronic principles.
This book offers such basic knowledge and provides guidance on how to obtain the relevant skills. The kinds of topics dealt with are operating principles, the performance of analog and digital components and circuits, and the precise characteristics of electronic measuring systems. Throughout the book, every endeavor is made to impart a critical attitude to the way in which such instruments should be implemented.
The book is based on various series of courses on electronics and electronic instrumentation that were given by the author during the many years when he lectured at Delft University of Technology in the Netherlands. The courses were designed for students from various departments such as: Mechanical Engineering, Aeronautical Engineering and Mining Engineering. When numbers of non-Dutch-speaking Master of Science students started to rise it became necessary to publish an English version of the book.
The particular way in which the book has been organized makes it suitable for a much wider readership. To meet the demands of divergent groups it has been structured in a modular fashion. Each chapter discusses just one particular topic and is divided into two parts: the first part provides the basic principles while more specific information is given in the second part. Each chapter ends with a summary and several exercises. Answers to all the exercises are given at the back of the book. This approach is conducive to self-study and to the composition of tailor-made course programs.
The required background knowledge is a basic grounding in mathematics and physics equivalent to any first-year academic level. No background knowledge of electronics is needed to understand the contents of the book. For further information on particular subjects the reader is referred to the many course books that exist on the subjects of electronics, measurement techniques and instrumentation.
Contents: 1. Measurement systems • 2. Signals • 3. Networks • 4. Mathematical tools • 5. Models • 6. Frequency diagrams • 7. Passive electronic components • 8. Passive filters • 9. PN diodes • 10. Bipolar transistors • 11. Fieldeffect transistors • 12. Operational amplifiers • 13. Frequency-selective transfer functions with operational amplifiers • 14. Non-linear signal processing with operational amplifiers • 15. Electronic switching circuits • 16. Signal generation • 17. Modulation • 18. Digital-to-analogue and analogue-to-digital conversion • 19. Digital electronics • 20. Measurement instruments • 21. Measurement errors • Appendix • Answers to exercises • Index
http://www.vssd.nl/hlf/e008.htm

Electrical networks

A. Henderson
1990-2007 / 416 pp. / paperback /
ISBN 978-90-6562-148-1 / € 24,50

The book begins with simple basic concepts and the principal circuit theorems, which form a good link to the knowledge of the starting student; initially the mathematics is not difficult either. Very soon the controlled sources (including opamps) are introduced.
Subsequently the whole theory is extended to alternating currents including complex voltages, currents and impedances, while the mathematics becomes increasingly complicated. The subsequent chapters discuss transformers, three-phase systems, Fourier analysis, the complex frequency, poles and zeros, two ports including filters and networks with switches (transient response). Then an extensive chapter on computer aided design follows; it turns out that the problems dealt with before can be solved by computer.
Each chapter finishes with a large number of problems with increasing difficulty. The book concludes with the answers to the problems. The book contains over 900 diagrams, vital for an understanding of electrical networks.
In the field of network theory one cannot avoid using mathematics, but the physical background of mathematical results will be clarified. In order to avoid calculations that are too complex in most cases simple values have been used for the network elements.
Contents Preface • Contents • Symbols • 1 d.c. currents and d.c. voltages • 2 Varying currents and voltages • 3 Some properties of networks • 4 Magnetic coupled inductors, transformers • 5 Three-phase systems • 6 Fourier series • 7 The complex frequency • 8 Two-ports, filters • 9 Networks containing switches • 10 Computer aided analysis • Apendices • Appendix I Linearity and superposition • Appendix II Tellegen's theorem • Appendix III Reciprocity • Appendix IV Thévenin's and Norton's theorems • Appendix V Star-delta transformation • Appendix VI Foster's theorem • Answers to Problems • Index
http://www.vssd.nl/hlf/e001.htm

Electromagnetic Waves — An introductory course

P.M. van den Berg, H. Blok and M.D. Verweij
2001 / X+244 pp. / ISBN 978-90-407-1836-6 /
€ 23,75
Electromagnetic waves appear in many forms and their applications are extremely widespread. Without exaggeration it may be said that our ability to employ and manipulate electromagnetic waves forms one of the reasons that communication plays such an important role in society.
The macroscopic theory of electromagnetic waves has been formulated by Maxwell in 1864. But the mathematical-physical nature of the subject makes it difficult for students to master even today. The continuous stream of new college textbooks shows that many teachers encounter this problem and attempt to resolve it by presenting the theory in some suitable form.
In the Electrical Engineering curriculum of the Delft University of Technology, the teaching of electromagnetic waves has been divided into three stages: 1) a basic course on Electricity and Magnetism, 2) an introductory course on Electromagnetic Waves, and 3) advanced courses on the application and computation of electromagnetic waves. The current book is written to facilitate the introductory course on Electromagnetic Waves. It is assumed that students are already acquainted with the basic phenomena and notions of the electric and the magnetic field, and that they know in which way Maxwell's equations describe the electromagnetic field. Starting from Maxwell's equations, this book deals with the derivation of plane wave propagation, plane wave reflection and transmission, electromagnetic rays, waves in two-wire transmission lines, waves in planar waveguides, and the excitation of electromagnetic waves. As such, the aim of the book is to provide a solid understanding of how the basic ingredients that make up the more sophisticated applications follow from Maxwell's equations.
The aim of the introductory course on Electromagnetic Waves is to teach students to manipulate the fundamental formulas in order to solve a problem at hand. To focus on this skill and to overcome the problem of having to learn many formulas by heart, an outline of this book is presented in the accompanying booklet (available from the website) entitled 'Electromagnetic Waves — A Repetitive Guide'.
Contents: Preface • 1 Introduction • 2 The Electromagnetic Field Equations • 3 One-dimensional Electromagnetic Waves • 4 Two-dimensional Electromagnetic Waves • 5 Electromagnetic Rays in a Two-dimensional Medium • 6 Transmission Lines • 7 Electromagnetic Waveguides • 8 Excitation of Two-dimensional Electromagnetic Waves • Answers to Exercises • Bibliography • Index
http://www.vssd.nl/hlf/e016.htm

System Reliability
Concepts and Applications

Klaas B. Klaassen and Jack C.L. van Peppen
2006 / 259 pp. / ISBN 978-90-71301-68-1 /
€ 20,50
The mind-boggling rate of industrial expansion of recent decades has produced innumerable technical devices and systems on which we rely in our daily life for modern convenience, safety, and sometimes even preservation of human lives. These modern artifacts cover a broad spectrum ranging from a relatively simple electronic watch to very complex transportation systems such as airplanes or spacecraft. Often, one is not even aware of the use of particular systems (part of our electrical energy is generated by nuclear reactors) until one is most unpleasantly reminded (Chernobyl disaster).
It is a proven fact that all these technical systems are producible, in other words: one can at least make them work at the time of first use. A higher order requirement, however, is that they remain serviceable throughout their expected useful life; i.e. that they are reliable. The consequences of an unreliable functioning of these systems may

vary from inconvenience, extra costs, environmental damage, to even death. Such inability to perform reliably may not only arise from the product itself (usually manifested in hardware or software failures), but also from human errors. Take for instance the (pilot) error where an aircraft is put down on the runway extremely hard. As the cover picture shows, this can result in a cracked fusilage and the dragging of the entire tail section over the runway until the aircraft comes to a complete stop.
The aim of this textbook is to familiarise the reader with the principles and terminology of reliability rngineering:

- Methods for improving reliability are discussed in detail;
- The approaches of deterministic and statistical reliability engineering are explained in such a way that the practical implications of the equations are clear;
- The book discusses methods of handling the reliability of large and complex systems;
- A chapter is devoted to the important topic of software reliability;
- The book contains a wonderful set of exercises and solutions manual.

Contents Preface • 1 Introduction • 2 Deterministic reliability • 3 Statistical reliability • 4 Statistical failure of components • 5 Reliability models • 6 Non-maintained systems • 7 Maintained systems • 8 Evaluation methods • 9 Reliability of computer software • Solutions to problems • Appendix • Literature • Index
http://www.vssd.nl/hlf/e003.htm

Materials science

Bamboo, a Sustainable Solution for Western Europe

Design Cases, LCAs and Land-use

Pablo van der Lugt, Joost Vogtländer, Han Brezet

2009 / viii + 135 pp.. / paperback /
ISBN 978-90-6562-196-2 / € 16.00

Materials have a considerable impact on the environmental sustainability of the products in which they are used. Due to the increasing population and consumption worldwide, more raw materials are consumed than can be produced globally, making especially resource depletion of both abiotic and biotic resources an urgent problem. Due to its good properties and high biomass production, bamboo could have the potential to help meet the increasing demand for raw materials, especially as a substitute for scarce and slow growing hardwood.
In this the environmental sustainability of various bamboo materials - based on consumption in Western Europe - are assessed based on LCA-methodology (Eco-costs) and annual yield predictions revealing if bamboo is actually a more environmentally sustainable choice than timber.
Contents: Foreword • 1 Introduction • 2 Environmental Impact in Eco-costs • 4 Conclusions • 5 Discussion & Recommendations • References • Appendix A: Environmental Assessment of Bamboo Materials • Appendix B: Carbon Sequestration by Bamboo • Abstract • Index
http://www.vssd.nl/hlf/m016.htm

Design Interventions for Stimulating Bamboo Commercialization

Dutch Design meets Bamboo as a Replicable Model

Pablo van der Lugt

2008 / xxii + 398 pp. / thesis / paperback /
ISBN 978-90-5155-047-4 / € 39,50

Materials have a considerable impact on the environmental sustainability of the products in which they are used. Due to the increasing population and consumption worldwide, more raw materials are consumed than can be produced globally, making especially resource depletion of both abiotic and biotic resources an urgent problem.
Due to its good properties and high biomass production, bamboo - a giant grass - could have the potential to help meet the increasing demand for raw materials, especially as a substitute for scarce and slow growing tropical hardwood. Nevertheless, in Western Europe, bamboo, especially in industrial form, is still a largely unknown material with a small market share. In this action research it is investigated how the commercialization of bamboo may be stimulated in consumer durable markets through the active integration of designers as potential material champions by means of design workshops. Besides providing insight into the effectiveness of this method and the potential replicability to deploy similar design interventions to stimulate the commercialization rate for other new or lesser known materials as well, this PhD thesis also presents the prototypes developed during the project "Dutch Design meets Bamboo" as well as the findings of the 21 participating Dutch designers about the potential of bamboo as a Western designer's material. Finally, the environmental sustainability of the various bamboo materials deployed during the design intervention are assessed based on LCA-methodology and annual yield predictions revealing if bamboo is actually a more environmentally sustainable choice than timber.
Contents
PART I: INTRODUCTION
1 Introduction • 2 Intervention Development • 3 Research Design
PART II: RESULTS
4 Product Evaluation; Market Potential and Innovative Character • 5 Product Evaluation; Environmental Sustainability • 6 Material Evaluation • 7 Impact Evaluation • 8 Process Evaluation & Advice for Improvement
PART III: CONCLUSIONS
9 Conclusions & Recommendations
References Samenvatting • Appendices • Epilogue • Publications • Colophon • Curriculum Vitae
http://www.vssd.nl/hlf/m015.htm

Fracture Mechanics

M. Janssen, J. Zuidema, R.J.H. Wanhill

2002 / xii + 365 pp. / ISBN 978-90-407-2221-9 / hardback / € 41.50

The authors of this textbook attempt to cover the basic concepts of fracture mechanics for both the linear elastic and elastic-plastic regimes. Three chapters are devoted to the fracture mechanics characterisation of crack growth (fatigue crack growth, sustained load fracture and dynamic crack growth). There are also two chapters dealing with mechanisms of fracture and the ways in which actual material behaviour influences the fracture mechanics characterisation of crack growth. The reader will find that this last topic is treated to some way beyond that of a basic course.

This second edition is the result of numerous revisions, updates and additions. These were driven by the ongoing development of fracture mechanics, but also by teaching the fracture mechanics course at Delft University of Technology. The fracture mechanics parameters K, G and J are now treated in a more basic manner. Test methods for JIc and for crack arrest toughness are updated. The development of failure assessment based on elastic-plastic fracture mechanics is reflected in a comprehensive treatment. On the subject of subcritical crack growth more attention has been paid to the important topic of the initiation and growth of short fatigue cracks.

This textbook is intended primarily for engineering students. We hope it will be useful to practising engineers as well, since it provides the background to several new design methods, criteria for material selection and guidelines for acceptance of weld defects.

Contents *Part I* Introduction • 1. An Overview

Part II Linear Elastic Fracture Mechanics • 2. An Elastic Stress Field Approach 3. Crack Tip Plasticity 4. The Energy Balance Approach 5. LEFM Testing

Part III Elastic-Plastic Fracture Mechanics • 6. Basic Aspects of Elastic-Plastic Fracture Mechanics 7. EPFM Testing 8. Failure Assessment Using EPFM

Part IV Fracture Mechanics Concepts for Crack Growth • 9. Fatigue Crack Growth 10. Sustained Load Fracture 11. Dynamic Crack Growth and Arrest

Part V Mechanisms of Fracture in Actual Materials • 12. Mechanisms of Fracture in Metallic Materials 13. The Influence of Material Behaviour in Fracture Mechanics Properties

http://www.vssd.nl/hlf/m004.htm

From Plant to Products

Van Iterson Jr and useful plants in the Botanical Garden of Delft University of Technology

Pieter van Mourik and Gerard van der Veen

2008 / 1st edition / 152 pp. / including DVD Growing Solutions / ISBN 978-90-6562-177-1 / paperback / full colour / € 19.50

Plants in botanical gardens refl ect the vastness and diversity of the plant kingdom. The Botanical Garden of Delft University of Technology explores the plant kingdom in order to contribute to a sustainable use of vegetable materials and products. The basis for this mission was laid by the founder of TU Delft Botanical Garden who, in 1907 in Delft, was awarded his doctorate with distinction and was appointed to a chair at the age of 29: Dr G. van Iterson Jr. During his long professorship (1907 – 1948) he examined the relationships between plants and their uses in numerous ways. Now at the beginning of the 21st century his approach is proving to be just as relevant, as is shown by the DVD fi lm 'Growing solutions' recently produced by TU Delft Botanical Garden. To mark the anniversary of Van Iterson Jr's appointment to his chair in 1907, it was decided in 2007 to publish a book on plants and their uses.

'From Plants to Products' is an illustrated guide to dozens of plants in the Botanical Garden that are not only beautiful to look at but are equally important because of their applications. Subsequent chapters provide information on the historical background, on the relationship between plants and technology, give striking examples of useful plants and examine some of the particular topics researched by Van Iterson Jr. Since current research projects in the TU Delft Botanical Garden are conducted on the basis of his principles, no distinction between the 'old' examples and the 'topical' cases has been made. Thus, history becomes part of the future. References and indexes help readers to fi nd their way in the guide. We hope the book will inspire people to return again and again to the garden. For the truth is, a plant only really comes to life in the fl esh, so to speak. The Society of Friends of the TU Delft Botanical Garden, which generously sponsored the guide, supports the garden in many different ways. In turn the Society itself looks for support. Join the Friends when you visit the TU Delft Botanical garden!

Contents:

http://www.vssd.nl/hlf/d009.htm

From Polymers to Plastics

A.K. van der Vegt

2006 / 268 pp. / paperback / ISBN 978-90-71301-62-9 / € 21.50

The two words in the title of this book, "polymers" and "plastics", could be considered as referring

to two different worlds. In the world of polymers, the properties of chain molecules are in the focus of attention, and are subject of thorough theoretical studies. In the world of plastics, the end-use performance of the technically used materials counts, as well as their behaviour in the various processing operations in which they are transformed into finished articles. Nevertheless, these two worlds are closely related. The typical behaviour of plastics materials, strongly deviating from other materials, can only be understood on the basis of the chain properties. In this book an attempt has been made to give a survey of polymer properties, and of the way these are, on the one hand, governed by their molecular structure, and are, on the other hand, responsible for the technological behaviour of plastics materials. As a result of this intention, cross-references are given throughout the whole book: every aspect of polymer science and of plastics technology is closely related to practically every other aspect!

This book originates from several series of lectures at the Delft University of Technology, recently integrated into a number of postgraduate and other courses. Since only a first introduction is given, more detailed treatment and more scientific depth have been sacrificed to the striving for survey and integration.

Contents Preface • 1. Introduction • 2. Molecular composition • 2. Glassy state and glass-rubber transition • 4. Crystalline polymers • 5. Rubbery and liquid phases • 6. Visco-elasticity • 7. Mechanical properties • 8. Further properties • 9. Polymeric compounds and composites • 10. Data on materials • 11. Processing techniques • Literature • Index

http://www.vssd.nl/hlf/m028.htm

Welding Technology

Gert den Ouden, Marcel Hermans

2009 / xii + 184 pp. / ISBN 978-90-6562-205-1 / paperback / € 22,50

Over the years a large number of techniques has been developed to join materials. Well known joining techniques are soldering, brazing, adhesive joining and welding, each playing an important role in the present manufacturing industry. In particular welding is applied on a wide scale, ranging from small products to large industrial constructions.

In welding the parts to be joined are heated, sometimes in combination with the application of pressure. The necessary heat can be provided by various sources. Use can be made, for instance, of heat produced by electric current passage, by chemical reactions, by radiation and by friction. Usually, a distinction is made between fusion welding and solid state welding.

The essential feature of fusion welding is that local melting of the material(s) takes place during the welding process followed by solidifi cation, whereas in the case of solid state welding no melting takes place and the weld is formed by plastic deformation and solid state reactions.

During welding the material to be welded is subjected to a thermal cycle, consisting of rapid heating, followed by relatively slow cooling. As a result of this thermal cycle different physical and chemical reactions take place in the liquid and solid phase, which are decisive for the properties of the welded joint.

This textbook deals with the different aspects of welding and is based on courses given at Delft University of Technology in the period 1980 - 2008. It is intended primarily for undergraduate and graduate students in materials science and mechanical engineering, but may also provide useful background information to engineers and researchers, who are professionally involved in welding.

The book is divided into three parts.

In Part I (Processes) the most important welding processes applied in industry are addressed. Specifi c attention is given to arc welding (Chapter 1), whereas a number of other processes are reviewed in Chapter 2.

Part II (Metallurgical aspects) deals with the effect of the thermal cycle due to welding on the structure and properties of the welded joint, including the development of residual stresses.

In Part III (Applications) the possibilities and limitations of welding carbon and lowalloy steel (Chapter 4), stainless steel (Chapter 5) and aluminium (Chapter 6) are discussed. Chapter 7 deals with non-destructive testing of welded joints.

http://www.vssd.nl/hlf/m012.htm

Mathematical geodesy

Series on Mathematical Geodesy and Positioning

http://www.vssd.nl/hlf/a030.htm

Adjustment Theory

P.J.G. Teunissen

2003 / 201 pp. / ISBN 978-90-407-1974-8 / € 18.00

Adjustment theory can be regarded as the part of the mathematical geodesy that deals with the optimal combination of redundant measurements together with the estimation of unknown parameters. It is essential for a geodesist, its meaning comparable to what mechanics means to a civil-engineer or mechanical engineer. Historically, the first methods of combining redundant measurements originate from the study of three problems in geodesy and astronomy, namely to determine the size and shape of the Earth, to explain the long-term inequality in the motions of Jupiter and Saturn, and to find a mathematical representation of the motions of the Moon. Nowadays, the methods of adjustment are used for a much greater variety of geodetic applications, ranging from, for instance, surveying and navigation to remote sensing and global positioning.

The two main reasons for performing redundant measurements are the wish to increase the accuracy of the results computed and the requirement to be able to check for errors. Due to

the intrinsic uncertainty in measurements, measurements redundancy generally leads to an inconsistent system of equations. Without additional criteria, such a system of equations is not uniquely solvable. In this introductory course on adjustment theory, methods are developed and presented for solving inconsistent systems of equations. The leading principle is that of least-squares adjustment together with its statistical properties.
The inconsistent systems of equations can come in many different guises. They could be given in parametric form, in implicit form, or as a combination of these two forms. In each case the same principle of least- squares applies. The algorithmic realizations of the solution will differ however. Depending on the application at hand, one could also wish to choose between obtaining the solution in one single step or in a step-by-step manner. This leads to the need of formulating the system of equations in partitioned form. Different partitions exist, measurement partitioning, parameter partitioning, or a partitioning of both measurements and parameters. The choice of partitioning also affects the algorithmic realization of the solution.
In this introductory text the methodology of adjustment is emphasized, although various samples are given to illustrate the theory. The methods discussed form the basis for solving different adjustment problems in geodesy.
Contents Introduction / Linear estimation theory: an introduction / The model with observation equations / The model with condition equations / v^R-Variates / Mixed model representations / Partitioned model representations / Nonlinear models, linearization, iteration / Appendices / Literature / Index

Series on Mathematical Geodesy and Positioning

Dynamic Data Processing

P.J.G. Teunissen
2001 / x + 241 pp. / ISBN 978-90-407-1976-4 / € 22.50
This book is a follow-up on Adjustment theory. It extends the theory to the case of time-varying parameters with an emphasis on their recursive determination. Least-squares estimation will be the leading principle used. A least-squares solution is said to be recursive when the method of computation enables sequential, rather than batch, processing of the measurement data. The recursive equations enable the updating of parameter estimates for new observations without the need to store all past observations. Methods of recursive least-squares estimation are therefore particularly useful for applications in which the time-varying parameters need to be instantly determined. Important examples of such applications can be found in the fields of real-time kinematic positioning, navigation and guidance, or multivariate time series analysis. The goal of this book is therefore to convey the necessary knowledge to be able to process sequentially collected measurements for the purpose of estimating time-varying parameters.
When determining time-varying parameters from sequentially collected measurement data, one can discriminate between three types of estimation problems: filtering, prediction and smoothing. Filtering aims at the determination of current parameter values, while smoothing and prediction aim at the determination of respectively past and future parameter values. The emphasis in this book will be on recursive least-squares filtering. The theory is worked out for the important case of linear(ized) models. The measurement-update and time-update equations of recursive least-squares are discussed in detail. Models with sequentially collected data, but time-invariant parameters are treated first.
In this case only the measurement-update equations apply. State-space models for dynamic systems are discussed so as to include time-varying parameters. This includes their linearization and the construction of the state transition matrix. Elements from the theory of random functions are used to describe the propagation laws for linear dynamic systems. The theory is illustrated by means of many worked out examples. They are drawn from applications such as kinematic positioning, satellite orbit determination and inertial navigation.
Contents Introduction / 1. Least-squares: a review / 2. Recursive least-squares: the static case / 3. Recursive least-squares: the static case / 4. State-space models for dynamic systems / 5. Random functions / 6. Recursive least squares: the dynamic case / Literature / Index

Series on Mathematical Geodesy and Positioning

Hydrography

C.D. de Jong, G. Lachapelle, S. Skone, I.A. Elema,
2003 / x+351 pp. / ISBN 978-90-407-2359-1 / hardback / € 30.35
This book is based on the lecture notes for the graduate and undergraduate courses in hydrography as offered at the Department of Geomatics Engineering of the Universitiy of Calgary and the Department of Mathematical Geodesy and Positioning of Delft University of Technology. The purpose of the book is to present an introduction to and an overview of the broad field of hydrography.
Since there is only a weak interdependence between the eleven chapters, each of them can be studied separately. When used for a course, it is therefore also possible to consider only a selected number of chapters.
Contents

1. Properties of water, waves, ocean currents and general circulation.
2. Tide-generating forces, tidal analysis and prediction.
3. Batch and recursive least squares estimation and quality control.
4. Coordinate systems, horizontal and vertical

datums, ellipsoidal computations.
5. Radio frequency definitions, propagation of electromagnetic waves, time keeping systems.
6. Underwater acoustics, propagation of underwater sound, sonar parameters and sonar equations.
7. Law of the Sea, baselines, maritime zones and boundaries, third party settlement.
8. Geometry of positioning, concepts, classification and requirements of positioning systems, standards for hydrographic surveys.
9. Terrestrial and satellite positioning systems, speed determination.
10. Underwater acoustic positioning systems, calibration of systems.
11. Acoustic (single- and multibeam) and airborne sounding methods, sidescan and oblique sonars.

Series on Mathematical Geodesy and Positioning

Network Quality Control

P.J.G. Teunissen

2006 / viii + 128 pp. / ISBN 978-90-71301-98-8 / € 16,00

The aim of computing a geodetic network is to determine the geometry of the configuration of a set of points from spatial observations (e.g. GPS baselines and/or terrestrial measurements). The configuration of points usually consists of newly established points, of which the coordinates still need to be determined, and already existing points, the so-called control points, of which the coordinates are known. Network quality control deals with the qualitative aspects of network design, network adjustment, network validation and network connection.

By means of a network adjustment the relative geometry of the new points is determined and integrated into the geometry of the existing control points. Prior to the network adjustment, the geometry of the network is designed on the basis of precision and reliability criteria.

The adjustment and validation of the overall geometry can be divided in two phases, the free network phase and the connected network phase. In the free network phase, the known coordinates of the control points do not take part in the adjustment and validation. The possible use of a free network phase is based on the idea that a good geodetic network should be sufficiently precise and reliable in itself, without the need of external control. Moreover, it allows one to validate the quality of the external control.

In the connected network phase, the geometry of the free network is integrated into the geometry of the control points. Adjustment and validation in this second phase differs from the free network phase. The adjustment in the second phase is a constrained connection adjustment, since it is often not practical to see the coordinates of the control points change everytime a free network is connected to them. For the validation of the connected network however, the unconstrained connected adjustment is used as input. This allows one to take the intrinsic uncertainty of the coordinates of the control points in the connection phase into account.

The goal of this introductory text on network quality control is to convey the necessary knowledge for designing, adjusting and testing geodetic networks. For the purpose of network design, the precision and reliability theory is worked out in detail. This includes the minimal detectable biases and the bias-to-noise ratios. For the purpose of the network adjustment, the principles of unconstrained-, constrained-, and minimally constrained least-squares estimation, are treated. For the network testing, the principles of hypothesis testing are presented and worked out for the different network cases. For the free network phase this includes the overall model test, the w-test, and the data snooping procedure. For the connected network phase, it includes the T-test, with an emphasis on the detection and identification of errors in the control points.

http://www.vssd.nl/hlf/a034.htm

Series on Mathematical Geodesy and Positioning

Testing Theory

P.J.G. Teunissen

2000 / viii+147 pp. / ISBN 978-90-407-1975-6 / € 18.00

The present lecture notes are a follow up on Adjustment theory. Adjustment theory deals with the optimal combination of redundant measurements together with the estimation of unknown parameters. There are two main reasons for performing redundant measurements. First, the wish to increase the accuracy of the results computed. Second, the requirement to be able to check for mistakes or errors. The present book addresses this second topic.

Although one always will try one's best to avoid making mistakes, they can and will occasionally happen. It is therefore of importance to have ways of detecting and identifying such mistakes. Mistakes or errors can come in many different guises. They could be caused by mistakes made by the observer, or by the fact that defective instruments are used, or by wrong assumptions about the functional relations between the observables. When passed unnoticed, these errors will deteriorate the final results. The goal of this introductory course on testing theory is therefore to convey the necessary knowledge for testing the validity of both the measurements and the mathematical model. Typical questions that will be addressed are: 'How to check the validity of the mathematical model? How to search for certain mistakes or errors? How well can errors be traced? And how do undetected errors affect

the final results?'
The theory is worked out in detail for the important case of linear(ized) models. Both the parametric form (observation equations) and the implicit form (condition equations) of linear models are treated. As an additional aid in understanding the basic principles involved, a geometric interpretation is given throughout. Attention is also paid to the performance of the testing procedures. The closely related concept of reliability is introduced and diagnostic measures are given to determine the size of the minimal detectable biases.
In this introductory text the methodology of testing is emphasized, although various examples are given to illustrate the theory. The methods discussed form the basis for geodetic quality control and they provide the ingredients for the formulation of guidelines for the reliable design of measurement set-ups.
Contents Introduction / Basic concepts of hypothesis testing / Testing of simple hyptheses / Testing of composite hypotheses / Hypothesis testing in linear models / Appendices / Literature / Index

Mathematics

Mathematical Systems Theory

G.J. Olsder and J.W. van der Woude
2005 / x+207 pp. / ISBN 978-90-71301-40-7 / hardback / € 25.00
A system is part of reality which we think to be a separated unit within this reality. The reality outside the system is called the surroundings. The interaction between system and surroundings is realized via quantities, which are called input and output. Quite often one wants, through a proper choice of the input, the system to behave in a desired way.
Mathematical Systems Theory is concerned with the study and control of input/output phenomena. The emphasis is on the dynamic behaviour of these phenomena, i.e. how do characteristic features change in time and what are the relationships.
These course notes are intended for use at the undergraduate level and form the basis for other courses such as optimal control and filter theory.
Contents: Introduction • Modelling principles • Linear differential systems • System properties • State and output feedback • Input/output representations • Polynomial representations • Linear difference systems • Extensions and some related topics.
http://www.vssd.nl/hlf/a003.htm

Numerical Methods for Ordinary Differential Equations

C. Vuik, P. van Beek, F. Vermolen, J. van Kan
2007 / viii + 121 pp. / ISBN 978-90-6562-156-6 / € 11,00
A big advantage of numerical mathematics is that a numerical solution can be obtained for problems, where an analytical solution does not exist. An additional advantage is, that a numerical method only uses evaluation of standard functions and the operations: addition, subtraction, multiplication and division. Because these are just the operations a computer can perform, numerical mathematics and computers form a perfect combination.
An analytical method gives the solution as a mathematical formula, which is an advantage. From this we can gain insight in the behavior and the properties of the solution, and with a numerical solution (that gives the function as a table) this is not the case. On the other hand some form of visualization may be used to gain insight in the behavior of the solution. To draw a graph of a function with a numerical method is usually a more useful tool than to evaluate the analytical solution at a great number of points.
In this book we discuss several numerical methods for solving ordinary differential equations. We emphasize those aspects that play an important role in practical problems. In this introductory text we confine ourselves to ordinary differential equations with the exception of the last chapter in which we discuss the heat equation, a parabolic partial differential equation. The techniques discussed in
the introductory chapters, for e.g. interpolation, numerical quadrature and the solution of nonlinear equations, may also be used outside the context of differential equations. They have been included to make the book self contained as far as the numerical aspects are concerned.
Contents Preface • 1. Introduction • 2. Interpolation • 3. Numerical differentiation • 4. Nonlinear equations • 5. Numerical quadrature • 6. Numerical time integration of initial value problems • 7. The finite difference method for boundary value problems • 8. The instationary equation • Literature • Index
http://www.vssd.nl/hlf/a026,htm

Numerical Methods in Scientific Computing

J. van Kan, A. Segal and F. Vermolen
2005-2008 / xii+284 pp. /
ISBN 978-90-71301-50-6 / hardback / € 26.00
This is a book about numerically solving partial differential equations occurring in technical and physical contexts and the authors have set themselves a more ambitious target than to just talk about the numerics. The aim is to show the place of numerical solutions in the general modeling process, which must inevitably lead to considerations about modeling itself. Partial differential equations usually are a consequence of applying first principles to a technical or physical problem at hand. That means, that most of the time the physics also have to be taken into account, especially for validation of the numerical solution obtained.
This book in other words is especially aimed at engineers and scientists who have 'real world' problems. It will concern itself less with pesky mathematical detail. For the interested reader though, we have included sections on mathematical theory to provide the necessary

mathematical background.
Contents 1 Modeling • 2 A Crash Course in PDE's • 3 Finite Difference Methods • 4 Finite Volume Methods • 5 Minimization Problems in Physics • 6 The Numerical Solution of Minimization Problems • 7 The Weak Formulation and Galerkin's Method • 8 Extension of the FEM • 9 Solution of large systems of equations • 10 The heat- or diffusion equation • 11 The wave equation • 12 The transport equation • 13 Moving boundary problems • Index
http://www.vssd.nl/hlf/a002.htm

Order in Space

A.K. van der Vegt
2006 / 93 pp. / ISBN 978-90-71301-61-2 / paperback / € 11.50
This book deals with a very old subject. Many centuries ago some people were already fascinated by polyhedra, and they spent much time in investigating regular spatial structures. In the terminology of polyhedra we, therefore, meet the names of Archimedes, Pythagoras, Plato, Kepler etc.
Today, polyhedra play a role in crystallography, art, architecture, and, in particular, in hobbyistic mathematics: many people are still so much delighted by them, that they cannot leave from constructing, analyzing and playing with polyhedra, and, above all, enjoying them.
This book is the result of several decades of these activities, step by step carried out in spare time. It is intended to stimulate fellow-hobbyists to a further interest in this fascinating subject!
Contents 1. Introduction • 2. Complete Regularity (Platonic Solids) • 3. Semiregularity (Archimedean or Uniform Polyhedra) • 4. Semiregularity Inverted (Uniform Polyhedra of the Second Kind) • 5. Regularity with Stars (Poinsot-Solids) • 6. Semi-Regularity with Stars (Higher-Order Archimedean Solids, UH's) • 7. More than Three Dimensions • Literature • Index
http://www.vssd.nl/hlf/a017.htm

Prallel Programming

An Introduction to Parallel Programming

Tobias Wittwer
2006 / viii + 53 pp. / ISBN 978-90-71301-78-0 / free download
Many scientific computations require a considerable amount of computing time. This computing time can be reduced by distributing a problem over several processors. Multiprocessor computers used to be quite expensive, and not everybody had access to them. Since 2005, x86-compatible CPUs designed for desktop computers are available with two "cores", which essentially makes them dualprocessor systems. More cores per CPU are to follow.
This cheap extra computing power has to be used efficiently, which equires parallel programming. Parallel programming methods that work on dual-core PCs also work on larger shared memory systems, and a program designed for a cluster or other type of distributed memory system will also perform well on your dual-core (or multi-core) PC.
The goal of this tutorial is to give an introduction into all aspects of parallel programming that are necessary to write ones own parallel programs. To achieve this, it explains

- the various existing architectures of parallel computers,
- the software needed for parallel programming, and how to install and configure it,
- how to analyse software and find the points where parallelisation might be helpful,
- how to write parallel programs for shared memory computers using OpenMP,
- how to write parallel programs for or distributed memory computers using MPI and ScaLA-PACK.

This tutorial mainly aims at writing parallel programs for solving linear equation systems. Hopefully it is also useful to give some help for parallelising programs for other applications.
Contents 1. Introduction • 2. System Architectures • 3. Software • 4. Performance Analysis • 5. SHALE - a program for spherical harmonic analysis • Bibliography • Index
http://www.vssd.nl/hlf/a019.htm