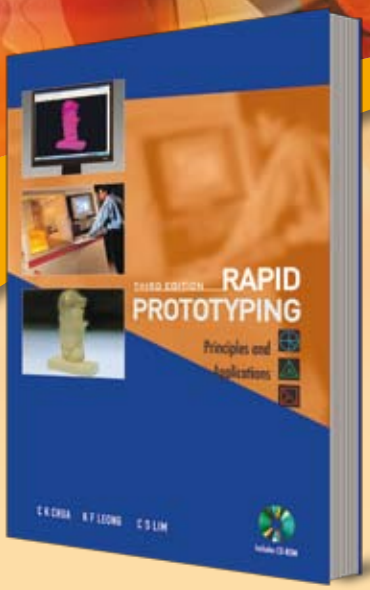
Connecting Great Minds

Mechanical Engineering and Engineering Mechanics Textbooks 2010



RAPID PROTOTYPING: Principles and Applications

(3rd Ed, with Companion CD-ROM)

by **C K Chua**, **K F Leong** & **C S Lim** *(Nanyang Technological University, Singapore)*

"To date, this is the only published text on RP that can be recommended to undergraduate students. Whenever I start my students off on a project that involves RP, and they say 'what is RP?', this is the book I give them to read. This book is an excellent introduction to RP." **Dr Ian Gibson, Co-Editor of Rapid Prototyping Journal, MCB Press, UK**

Now in its third edition, this textbook is still the definitive text on RP. It covers the key RP processes, the available models and specifications, and their principles, materials, advantages and disadvantages. Examples of application areas in design, planning, manufacturing, biomedical engineering, art and architecture are also given. New to this edition, the included CD-ROM presents animated illustrations of the working principles of today's key RP processes.

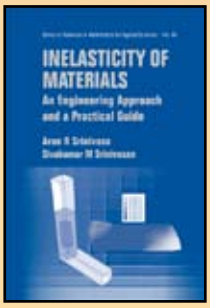
Readership: Diploma and advanced diploma students, undergraduates, postgraduates, consultants, academics and professionals in mechanical and industrial engineering.

550pp (approx.)	**Jan 2010**	
978-981-277-897-0	**US$96**	**£49**
978-981-277-898-7(pbk)	**US$69**	**£36**

Series on Advances in Mathematics for Applied Sciences – Vol. 80

INELASTICITY OF MATERIALS:

An Engineering Approach and a Practical Guide



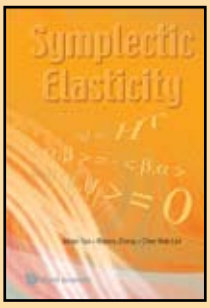
by **Arun R Srinivasa** *(Texas A&M University, USA)* & **Sivakumar M Srinivasan** *(Indian Institute of Technology, Madras, India)*

The book is written in three parts. Part 1 is primarily focused on lumped parameter models and simple structural elements such as trusses and beams. This is suitable for an advanced undergraduate class with just a strength of materials background. Part II is focused on small deformation multi-dimensional inelasticity and is suitable for a beginning graduate class. Sufficient material is included on how to numerically implement an inelastic model and solve either using a simple stress function type of approach or using commercial software. Case studies are included as examples. There is also an extensive discussion of thermodynamics in the context of small deformations. Part III focuses on more advanced situations such as finite deformation inelasticity, thermodynamical ideas and crystal plasticity. More advanced case studies are included in this part.

Readership: Mechanical, aeronautical, civil and metallurgical engineers; material scientists; biomechanists and engineers interested in inelastic/nonlinear systems.

572pp	**Jul 2009**	
978-981-283-749-3	**US$85**	**£64**

SYMPLECTIC ELASTICITY



by **Weian Yao**, **Wanxie Zhong** *(Dalian University of Technology, P R China)* & **Chee Wah Lim** *(City University of Hong Kong, Hong Kong, SAR)*

This book explains the new solution methodology by discussing plane isotropic elasticity, multiple layered plate, anisotropic elasticity, sectorial plate and thin plate bending problems in detail. A number of existing problems without analytical solutions within the framework of classical approaches are solved analytically using this symplectic approach. Symplectic methodologies can be applied not only to problems in elasticity, but also to other solid mechanics problems. In addition, it can also be extended to various engineering mechanics and mathematical physics fields, such as vibration, wave propagation, control theory, electromagnetism and quantum mechanics.

Readership: Undergraduate and postgraduate students majoring in engineering mechanics or having it as an elective; researchers in solid mechanics.

316pp	**Feb 2009**	
978-981-277-870-3	**US$76**	**£39**

HIGHLIGHTS

Engineering Materials for Technological Needs – Vol. 2

FUNCTIONAL MATERIALS: Electrical, Dielectric, Electromagnetic, Optical and Magnetic Applications (With Companion Solution Manual)

by **Deborah D L Chung** *(State University of New York, USA)*

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Series on Hydraulic Machinery – Vol. 3

VIBRATION AND OSCILLATION OF HYDRAULIC MACHINERY (2nd Ed)

by **Yulin Wu** *(Tsinghua University, China)*

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INTRODUCTION TO MICROMECHANICS AND NANOMECHANICS

by **Shaofan Li** *(University of California at Berkeley, USA)* & **Gang Wang** *(Hong Kong University of Science and Technology, China)*

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FUNCTIONAL MATERIALS:Electrical, Dielectric, Electromagnetic, Optical and Magnetic Applications (With Companion Solution Manual)

by **Deborah D L Chung** *(State University of New York, USA)*

Functional Materials assumes that the readers have had a one-semester introductory undergraduate course on materials science. The coverage on functional materials is much broader and deeper than that of an introductory materials science course.The book features hundreds of illustrations to help explain concepts and provide quantitative information. The style is general towards tutorial. Most chapters include sections on example problems, review questions and supplementary reading.

Readership: Undergraduate students, graduate students and professionals in most branches of engineering, specifically materials, electrical, mechanical, aerospace, chemical and civil engineering. Relevant professionals include engineers, scientists, researchers, technicians and technology managers.

360pp (approx.)	Scheduled Spring 2010	
978-981-4287-15-9	US$85	£64
978-981-4287-16-6(pbk)	US$45	£34

Series on Hydraulic Machinery – Vol. 3

VIBRATION AND OSCILLATION OF HYDRAULIC MACHINERY (2nd Ed)

by **Yulin Wu** *(Tsinghua University, China)*

Vibration and Oscillation of Hydraulic Machinery covers the fundamentals of mechanical vibration and rotordynamics as well as their main numerical models and analysis methods. The mechanical and hydraulic excitations to the vibration will be analyzed, and the pressure fluctuations induced by the unsteady turbulent flow will be predicted in order to get and obtain the unsteady loads. Upon obtaining the information of loads, constraint conditions and the elastic and dimpling characters of the mechanical system, the structure dynamic analysis and the rotor dynamic analysis and the system instability of hydraulic machines are reviewed and described, including the illustration of monitoring system for the instability and the vibration in hydraulic units.

Readership: Graduates and undergraduates specializing in the field of hydraulic machinery.

550pp (approx.)	Scheduled Summer 2010	
978-1-84816-443-7	US$108	£81

ENGINEERING THERMODYNAMICS WITH WORKED EXAMPLES

by **Nihal E Wijeysundera** *(National University of Singapore, Singapore)*

The book includes all the subject matter covered in a typical undergraduate course in engineering thermodynamics. It includes 20 to 25 worked examples for each chapter, carefully chosen to expose students to diverse applications of engineering thermodynamics. Each worked example is designed to be representative of a class of physical problems. At the end of each chapter, there are an additional 10 to 15 problems for which numerical answers are provided.

Readership: Undergraduate and graduate students in mechanical engineering, chemical engineering, civil engineering, electrical & electronic engineering, bioengineering, applied physics and thermodynamics.

450pp (approx.)	Scheduled Summer 2010	
978-981-4293-13-6	US$120	£90
978-981-4293-14-3(pbk)	US$60	£45

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DYNAMICS OF FLOATING OFFSHORE STRUCTURES

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This textbook will provide a complete coverage on the dynamics of floating offshore structures. Topics like random waves, wind and current, etc. will be developed from the fundamental principles and their applications to offshore structures will be discussed. The design aspect of the offshore structure, both for short-term and long-term response and structural fatigue, are important elements of the dynamic response and will be further elaborated upon in the text. The uniqueness of this textbook lies in its treatment of theoretical and practical aspects of offshore structure dynamics and will stand out from the other available publications on this general subject.

Readership: Senior undergraduate, graduates and researchers in offshore and ocean engineering.

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978-981-4280-55-6	US$95	£71
978-981-4280-56-3(pbk)	US$55	£41

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by **Ming Xie** *(Nanyang Technological University, Singapore)*, **Hui Chen** *(Tongji University, China)* & **Zhencheng Hu** *(Kumamoto University, Japan)*

This book provides a broad introduction to the three key modules behind the design and development of intelligent vehicles for the ultimate purpose of actively ensuring driving safety as well as preventing accidents from all possible causes. Self-contained and unified in presentation, the book explains in detail the fundamental solutions of vehicle perception, vehicle decision-making and vehicle action-taking in a pedagogic order. Besides the fundamental knowledge and concepts of intelligent vehicle's perception, decision and action, this book includes a comprehensive set of real-life application scenarios in which intelligent vehicles will play a major role or contribution. These case studies of real-life applications will help motivate students to learn this exciting subject.

Readership: Advanced undergraduate and graduate students in automotive engineering, mechanical engineering and computer science; researchers and practitioners in automotive industries.

300pp (approx.)	Scheduled Fall 2010	
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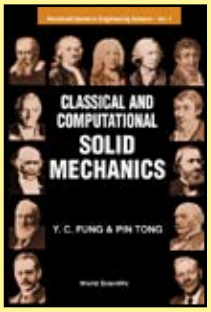


"... this is a good, comprehensive, unified presentation of much of the field of solid mechanics, written by two well-regarded researchers in that field." **Applied Mechanics Reviews**

This invaluable book gives first priority to the formulation of problems, presenting the classical results as the gold standard, and the numerical approach as a tool for obtaining solutions. The classical part includes a much-expanded discussion on the theories of plasticity and large elastic deformation with finite strains. The computational part is all new and is aimed at solving many major linear and nonlinear boundary-value problems.

Readership: Graduate and senior undergraduate students as well as researchers in computational mechanics, civil engineering, mechanical engineering, bioengineering, aeronautics, astronautics and materials science.

952pp	Jul 2001	
978-981-02-3912-1	US$98	£65
978-981-02-4124-7(pbk)	US$49	£33

FINITE ELEMENT MODELING OF MULTISCALE TRANSPORT PHENOMENA

by **Vahid Nassehi** *(Loughborough University, UK)* & **Mahmoud Parvazinia** *(Iran Polymer and Petrochemical Institute, Iran)*

Due to the importance of the described multiscale processes in applications such as separation processes, reaction engineering and environmental systems analysis, a sound knowledge of such methods is essential for many researchers and design engineers who wish to develop reliable solutions for industrially relevant problems. The main scope of this book is to provide an authoritative description of recent developments in the field of finite element analysis, with a particular emphasis on the multiscale finite element modeling of transport phenomena and flow problem.

Readership: Graduate students, researchers and engineers in the field of mechanical engineering, chemical engineering, material engineering, civil engineering, applied mathematics and physics.

280pp (approx.)	**Scheduled Fall 2010**	
978-1-84816-429-1	**US$65**	**£49**

NONLOCAL CONTINUUM DAMAGE AND PLASTICITY:Theory and Computations

by **George Z Voyiadjis** *(Louisiana State University, USA)* & **Rashid K Abu Al-Rub** *(Texas A&M University, USA)*

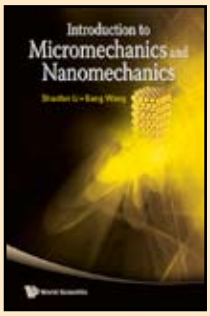
Modeling of the evolution of distributed damage and plasticity such as micro-cracking, void formation, dislocation densities, and shear bands necessitates strain-softening constitutive models. The nonlocal continuum concept has emerged as an effective means for regularizing the (initial) boundary value problems with strain softening, capturing the size effects observed in experiments, capturing small-scale deviations from local continuum models caused by material heterogeneity, and avoiding spurious localization that gives rise to pathological mesh sensitivity in numerical computations. This book discusses the integral and gradient formulations of nonlocality, computational aspects, and comparison of approaches and emphasizes recent developments in the bridging of material length scales.

Readership: Researchers in the academic community, national laboratories in materials and solid mechanics, companies in engineering mechanics and materials, and graduate students.

600pp (approx.)	**Scheduled Winter 2010**	
978-981-281-397-8	**US$128**	**£69**

Top Adopted Textbooks

INTRODUCTION TO MICROMECHANICS AND NANOMECHANICS



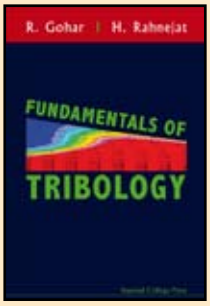
by **Shaofan Li** *(University of California at Berkeley, USA)* & **Gang Wang** *(Hong Kong University of Science and Technology, China)*

"This new book furnishes a most comprehensive and self-contained introduction to the state-of-the-art knowledge of micromechanics and nanomechanics. In addition, the way that the book is organized is very logical, and the presentation is quite clear, and the examples and excises included are excellent. These make the book very suitable and competitive as an excellent textbook and an indispensable reference for professors, graduate students and researchers who desire to learn and to contribute to the subject."
Xin-Lin Gao, Associate Professor, Texas A&M University

Readership: Researchers and educators in academics, first year graduate students in engineering mechanics, materials science, nanotechnology, mechanical engineering, civil engineering, and applied mechanics.

516pp	**Jul 2008**	
978-981-281-413-5	**US$95**	**£49**
978-981-281-414-2(pbk)	**US$58**	**£29**

FUNDAMENTALS OF TRIBOLOGY



by **R Gohar** *(Imperial College London, UK)* & **H Rahnejat** *(Loughborough University, UK)*

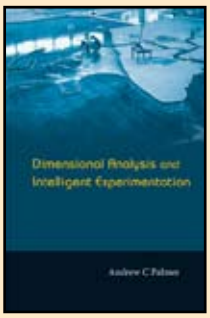
"Questions and answers at the end of the book make it an appropriate text for an undergraduate course in materials science or mechanical engineering … this textbook does provide the reader with a solid background in the theory of tribology."
IEEE Electrical Insulation Magazine

Readership: Advanced undergraduates and PhD students starting their research; practicing engineers and scientists in industry.

420pp	**Jul 2008**	
978-1-84816-184-9	**US$76**	**£39**

DIMENSIONAL ANALYSIS AND INTELLIGENT EXPERIMENTATION

by **Andrew C Palmer** *(National University of Singapore, Singapore)*



This book demonstrates what can be done with dimensional analysis through a series of examples, starting with Pythagoras' theorem and the simple pendulum, and going on to a number of practical examples, many from the author's experience in ocean engineering. In parallel, the book explains the underlying theory, starting with Vaschy's elegant treatment, whilst avoiding unnecessary complexity. It also explores the use and misuse of models, which can be useful but can also be seriously misleading.

Readership: Undergraduate and graduate (MSc) students interested in dimensional analysis.

164pp	**Jun 2008**	
978-981-270-818-2	**US$45**	**£25**
978-981-270-819-9(pbk)	**US$29**	**£17**

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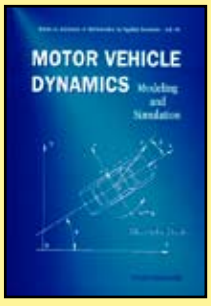


Series on Advances in Mathematics for Applied Sciences – Vol. 43

MOTOR VEHICLE DYNAMICS: MODELING AND SIMULATION

by Giancarlo Genta *(Politecnico di Torino, Italia)*

"… the author provides an interesting and comprehensive treatment of a very complicated subject … it would be a good addition to the bookshelf of any engineer with an interest in vehicle dynamics or general automotive technology."
Applied Mechanics Reviews

Readership: Mechanical engineers.

564pp	**Apr 1997**	
978-981-02-2911-5	**US$98**	**£56**

Series on Industrial and Systems Engineering – Vol. 1

ENGINEERING SAFETY:Fundamentals, Techniques, and Applications

by **B S Dhillon** *(University of Ottawa, Canada)*

Safety has become very important because each year a vast number of people die due to workplace and other accidents. For example, in the United States for the year 1996 as per the National Safety Council, there were 93,400 deaths and 20,700,000 disabling injuries due to workplace accidents, with a total loss of $121 billion. Today there are a large number of books available on safety, but to the best of the author's knowledge none covers both general and systems safety (i.e., at a significant depth) and application or specialized areas such as software safety, robot safety, health care safety, and maintenance safety. This book has been written to satisfy that vital need.

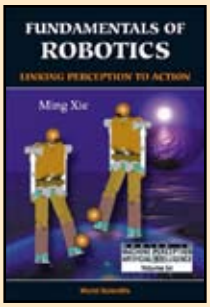
Readership: Senior level undergraduates and graduate students in safety/industrial engineering; safety professionals and researchers; company safety officers; engineering designers.

240pp	**Mar 2003**	
978-981-238-221-4	**US$47**	**£32**
978-981-238-328-0(pbk)	**US$28**	**£19**

Series in Machine Perception and Artificial Intelligence – Vol. 54

FUNDAMENTALS OF ROBOTICS:Linking Perception to Action

by **Ming Xie** *(Singapore–MIT Alliance & Nanyang Technological University, Singapore)*



These days, robotics is offered in almost every university in the world. Most mechanical engineering departments offer a similar course at both the undergraduate and graduate levels. And increasingly, many computer and electrical engineering departments are also offering it. The book will cover practical knowledge in understanding, developing, and using robots as versatile equipment to automate a variety of industrial processes or tasks. But, the book will also discuss the possibilities we can look forward to when we are capable of creating a vision-guided, learning machine.

Readership: Upper-level undergraduates, graduates and researchers in robotics & automated systems, artificial intelligence, machine perception and computer vision.

716pp	**Apr 2003**	
978-981-238-313-6	**US$132**	**£96**
978-981-238-335-8(pbk)	**US$65**	**£47**

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Title	Pub Date	Affiliation	Author	ISBN	US$	£
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