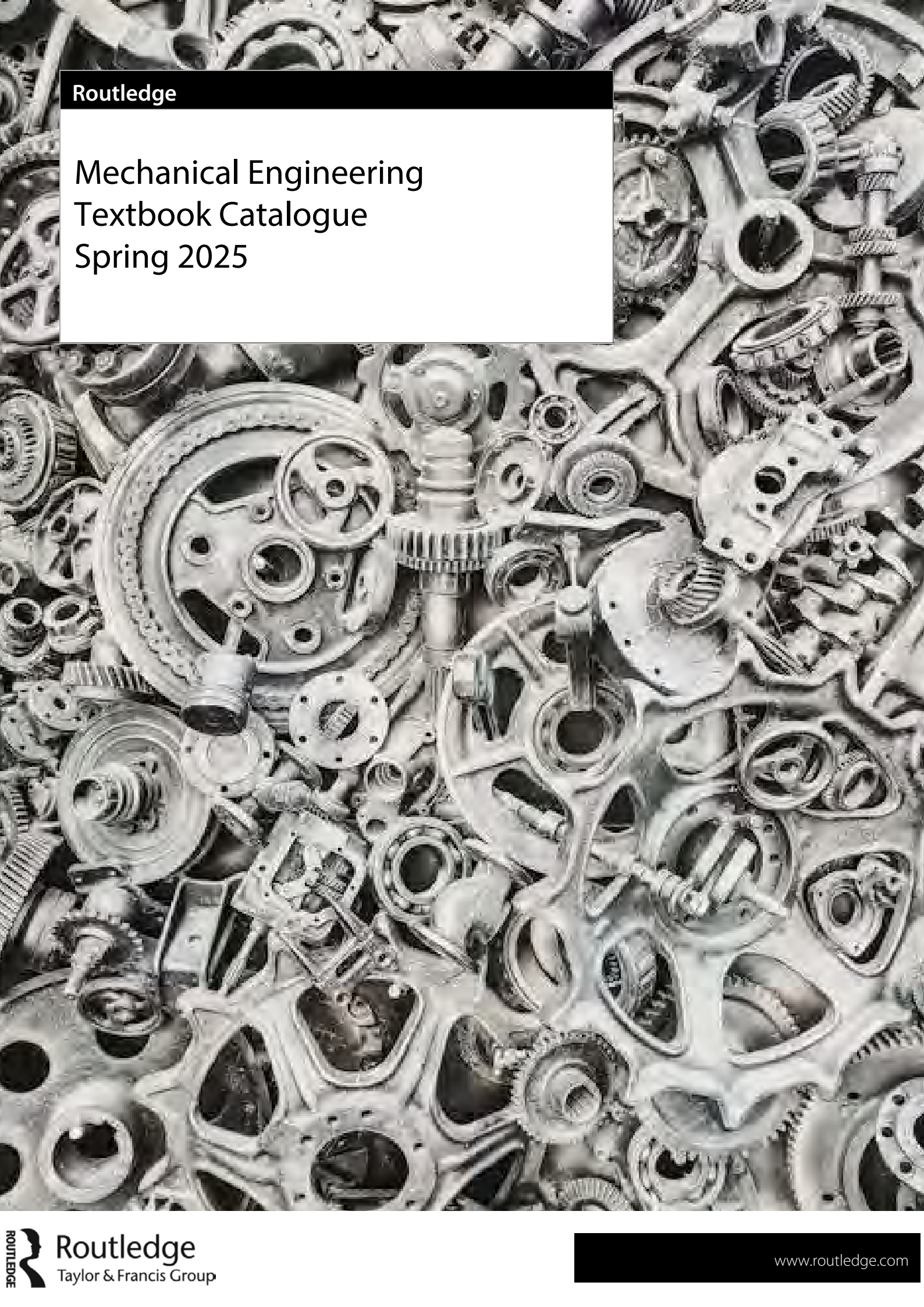




Routledge

Mechanical Engineering
Textbook Catalogue
Spring 2025



Welcome

Welcome to the Taylor and Francis Mechanical Engineering Textbook Catalogue.

eBooks

We have over 50,000 eBooks available across the Humanities, Social Sciences, Behavioural Sciences, Built Environment, STM and Law, from leading Imprints, including Routledge, Focal Press and Psychology Press. These eBooks are available for both individual and institutional purchase.

INDIVIDUALS

Our eBooks are available from Amazon, Apple iBookstore, Google eBooks, Ebooks.com, Kobo, Barnes & Noble, Waterstones, Mobipocket, VitalSource, and CourseSmart.

LIBRARIES AND INSTITUTIONS

Subscribe to or purchase a wide range of eBook packages or pick and mix your own from our complete collection (a minimum number of titles applies). FREE TRIALS are available. For more information, please visit www.tandfebooks.com or contact your local sales team.

eUpdates

Register your email at www.tandf.co.uk/eupdates to receive information on books, journals and other news within your area of interest.

an **informa** business

Prices, publication dates and content are correct at time of going to press, but may be subject to change without notice.

Partnership Opportunities at Routledge

At Routledge we always look for innovative ways to support and collaborate with our readers and the organizations they represent.

If you or your organization would like to discuss partnership opportunities, from reciprocal marketing activities to commercial enterprises, please do get in touch on partnerships@routledge.com.

Considering Books for Course Use?



This symbol shows books that are available as complimentary exam copies for lecturers or faculty considering them for course adoption. To obtain your copy visit the URL listed beneath the title in the catalog and select your choice of print or electronic copy.

Visit www.routledge.com or in the US you can call 1-800-634-7064.



This symbol shows books that are available as electronic inspection copies only.

For a complete list, visit: www.routledge.com/representatives.

Trade Customers' Representatives, Agents and Distribution

For a complete list, visit:
www.routledge.com/representatives.

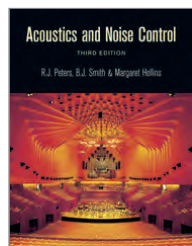


Contents

Acoustics & Noise Control	2	Fracture Mechanics	44
Advanced Fluid Dynamics	3	Fracture Mechanics - Advanced	45
Advanced Heat Transfer	4	Heat Exchangers	46
Advanced Mechanics of Solids	5	Heating, Cooling & Air Conditioning	47
Advanced Thermodynamics	6	Intermediate/Advanced Dynamics	48
Automotive Engineering - Accident Reconstruction	7	Introduction to Engineering Computation	49
Automotive Engineering - Electric Vehicles	8	Introduction to Engineering Heat Transfer	50
Automotive Engineering - Vehicle Dynamics	9	Introduction to Materials Science	51
Automotive Engineering (Introduction)	10	Introduction to Mechanical Engineering (UK/ROW)	52
Biomass Energy	11	Introduction to Thermodynamics	53
Combustion Engineering	12	Introduction to Tribology	54
Computational Fluid Dynamics (brief)	13	Kinematics & Dynamics of Machinery	55
Computational Fluid Dynamics (comprehensive)	14	Machine/Machine Components Design	56
Conductive Heat Transfer	15	Machinery	57
Continuum Mechanics	16	Manufacturing Processes/Introduction to Manufacturing	58
Control Systems/Linear Control	17	Measurement and Data Analysis for Engineers	59
Convective Heat Transfer	18	Mechanical Behaviour of Materials	60
Design of Thermal Systems	19	Mechanical Vibration	61
Design of Thermal-Fluid Systems	20	Mechanics of Composite Materials	62
Dynamic Systems	21	Mechanics of Materials	63
Elasticity and Plasticity	22	Mechanism Design	64
Energy & Society	23	Mechatronics	65
Energy Storage	24	Multibody Dynamics	66
Engineering Design/Product Design	25	Multiphase Fluid Flow	67
Engineering Dynamics	27	Numerical Methods for Engineers	68
Engineering Education	28	Plates and Shells	69
Engineering Failure Analysis	29	Precision Engineering	70
Engineering Management	30	Process Design and Intensification	71
Engineering Mathematics	31	Radiation Heat Transfer	72
Engineering Mathematics - Advanced	33	Renewable Energy (brief)	73
Engineering Reliability	34	Renewable Energy (comprehensive)	74
Engineering Statics	35	Sensors & Actuators	75
Engineering Thermodynamics	36	Solar Energy	76
Experimental Methods	37	Structural Dynamics	77
Finite Element Analysis	38	System of Systems	78
Finite Element Analysis - Advanced	39	Turbomachinery	79
Finite Elements for Thermal-Fluid Engineering	40	Wind Energy	80
Fluid Mechanics	41	Index	81
Fluid Mechanics (Advanced)	42		
Fluid Power/Hydraulic Systems	43		

3RD EDITION

Acoustics and Noise Control

**R J Peters**

Acoustics and Noise Control provides a detailed and comprehensive introduction to the principles and practice of acoustics and noise control. Since the last edition was published in 1996 there have been many changes and additions to standards, laws and regulations, codes of practice relating to noise, and in noise measurement techniques and noise control technology so this new edition has been fully revised and updated throughout. The book assumes no previous knowledge of the subject and requires only a basic knowledge of mathematics and physics. There are worked examples in the text to aid understanding and a range of experiments help students use complicated apparatus. Thoroughly revised to cover the latest changes in standards, codes of practice and legislation, this new edition covers much of the Institute of Acoustics Diploma syllabus and has an increased emphasis on the legal issues relating to noise control.

Routledge

June 2011 : 400pp

Pb: 978-0-273-72468-1 : **£76.99**Hb: 978-1-138-12912-2 : **£130**

eBook: 978-1-315-84714-6

* For full contents and more information, visit: www.routledge.com/9780273724681

6TH EDITION

Engineering Noise Control



David A. Bies University of Adelaide, Australia, **Colin H. Hansen** University of Adelaide, Australia, **Carl Q. Howard** The University of Adelaide, Australia, **Kristy L. Hansen** Flinders University, Australia

This textbook sets out the foundations of noise control technology in detail, and can be used to solve the real world problems encountered by consultants and engineers. It covers the fundamentals of acoustics, theoretical concepts, and practical application of current noise control technology. This new edition particularly develops material on sound propagation, especially outdoor noise; subjective response to noise; resonator mufflers; and porous absorbers. Detail is added on microphones and sensors; free-field simulation; and wind turbine sound. It is well illustrated with practical examples, with further problems on www.causalsystems.com

CRC Press

August 2023 : 922pp

Pb: 978-0-367-41478-8 : **£59.99**Hb: 978-0-367-41479-5 : **£160**

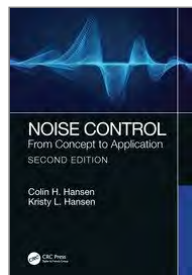
eBook: 978-0-367-81490-8

* For full contents and more information, visit: www.routledge.com/9780367414788

2ND EDITION

Noise Control

From Concept to Application



Colin Hansen University of Adelaide, Australia, **Kristy L. Hansen** Flinders University, Australia

The second edition of Noise Control: From Concept to Application, newly expanded and thoroughly updated, now includes 180 graded problems with solutions, plus 100 end-of-chapter problems with solutions available for instructors on the authors' website. Working from basic scientific principles, the authors show how an understanding of sound can be applied to real-world settings, working through numerous examples in detail and covering good practice in noise control for both new and existing facilities.

CRC Press

August 2021 : 482pp

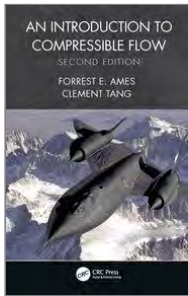
Pb: 978-1-138-36902-3 : **£61.99**Hb: 978-1-138-36901-6 : **£155**

eBook: 978-0-429-42887-6

* For full contents and more information, visit: www.routledge.com/9781138369023

2ND EDITION

An Introduction to Compressible Flow



Forrest E. Ames University of North Dakota, USA,
Clement C. Tang University of North Dakota, USA

An Introduction to Compressible Flow, Second Edition covers the material typical of a single-semester course in compressible flow. The book begins with a brief review of thermodynamics and control volume fluid dynamics, then proceeds to cover isentropic flow, normal shock waves, shock tubes, oblique shock waves, Prandtl-Meyer expansion fans, Fanno-line flow, Rayleigh-line flow, and conical shock waves. The book is intended for senior undergraduate engineering students studying thermal-fluids and practicing engineers in the areas of aerospace or energy conversion. It also provides supplemental coverage of compressible flow material in gas turbine and aerodynamics courses.

CRC Press

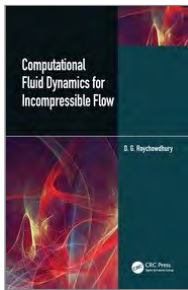
July 2023 : 296pp

Pb: 978-0-367-69779-2 : **£45.99**Hb: 978-0-367-89567-9 : **£120**

eBook: 978-1-003-04294-5

* For full contents and more information, visit: www.routledge.com/9780367697792

Computational Fluid Dynamics for Incompressible Flows



D.G. Roychowdhury

Presenting fundamental as well as advanced concepts in the field of computational fluid dynamics in an easy to understand manner, this textbook will be useful for senior undergraduate and graduate students in the field of mechanical and aerospace engineering. It discusses various finite difference methods and finite volume methods including Von Neumann's method, Lax equivalence theorem, time, dependent method, one-step method, Dufort-Frankel method, and MacCormack method.

CRC Press

February 2022 : 416pp

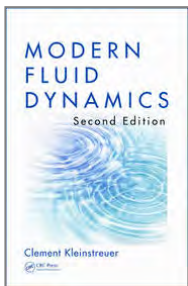
Pb: 978-0-367-52432-6 : **£47.99**Hb: 978-0-367-40806-0 : **£135**

eBook: 978-0-367-80917-1

* For full contents and more information, visit: www.routledge.com/9780367524326

2ND EDITION

Modern Fluid Dynamics



Clement Kleinstreuer

Modern Fluid Dynamics, Second Edition provides up-to-date coverage of intermediate and advanced fluids topics. The text emphasizes fundamentals and applications, supported by worked examples and case studies. Scale analysis, non-Newtonian fluid flow, surface coating, convection heat transfer, lubrication, fluid-particle dynamics, microfluidics, entropy generation, and fluid-structure interactions are among the topics covered. Part A presents fluids principles, and prepares readers for the applications of fluid dynamics covered in Part B, which includes computer simulations and project writing. A review of the engineering math needed for fluid dynamics is included in an appendix.

CRC Press

April 2018 : 459pp

Hb: 978-1-138-19810-4 : **£175**

eBook: 978-1-315-22627-9

* For full contents and more information, visit: www.routledge.com/9781138198104

3RD EDITION

Advanced Heat Transfer



Greg F. Naterer

Advanced Heat Transfer provides a single source of technical content for the prediction, solution, and analysis of advanced heat transfer problems, including conduction, convection, radiation and phase change, and chemically reactive modes of heat transfer. The book offers a comprehensive source for single and multiphase systems of heat transfer for graduate students taking courses in Advanced Heat Transfer; Multiphase Heat Transfer; Advanced Thermodynamics. With more than 20 new sections, case studies, examples, and problems, the new edition broadens the scope of thermal engineering applications, including biomedical fields, micro- and nanotechnology, and machine learning.

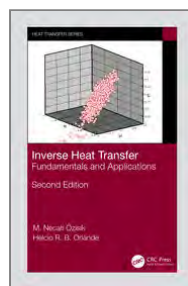
CRC Press
December 2021 : 577pp
Hb: 978-1-032-07247-0 : £120
eBook: 978-1-003-20612-5

* For full contents and more information, visit: www.routledge.com/9781032072470

2ND EDITION

Inverse Heat Transfer

Fundamentals and Applications



M. Necat Ozisik, Helcio R.B. Orlande Coppe - UFRJ, Brazil

Series: Heat Transfer

This book introduces the fundamental concepts of inverse heat transfer solutions and their application for solving problems in convective, conductive, radiative, and multi-physics problems. By modernizing the classic work of the late Dr. Ozisik, and adding new examples and problems, this new edition provides a powerful tool for instructors, researchers, and graduate students studying thermal-fluid systems and heat transfer. The textbook includes based on generalized coordinates for the solution of inverse heat conduction problems in two-dimensional regions, involving the introduction of techniques within the Bayesian framework of statistics for solution of inverse problems.

CRC Press
April 2021 : 297pp
Hb: 978-0-367-82067-1 : £115
eBook: 978-1-003-15515-7

* For full contents and more information, visit: www.routledge.com/9780367820671

2ND EDITION

Analytical Heat Transfer



Je-Chin Han, Lesley Wright

The book explains how to analyze and solve conduction, convection, and radiation heat transfer problems. It fills the gap between basic heat transfer undergraduate courses and advanced heat transfer graduate courses for one semester of intermediate heat transfer; advanced conduction/convection heat transfer; or radiation heat transfer. The text enables students to tackle complex engineering heat transfer problems prevalent in practice. New chapters and content include Duhamel's superposition method, Green's function method for transient heat conduction, finite-difference method for steady state and transient heat conduction in cylindrical coordinates, and laminar mixed convection.

CRC Press
December 2024 : 595pp
Pb: 978-0-367-75900-1 : £45.99
Hb: 978-0-367-75897-4 : £115
eBook: 978-1-003-16448-7

* For full contents and more information, visit: www.routledge.com/9780367759001

Heat Transfer

A Systematic Learning Approach



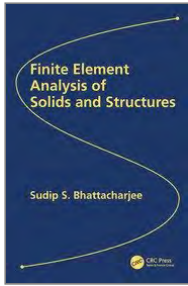
Naseem Uddin Universiti Teknologi Brunei

Heat Transfer: A Systematic Learning Approach presents valuable tools in understanding heat transfer mechanisms and provides a clear understanding of complex turbulent flows. It provides a comprehensive introduction to topics of heat transfer, including conduction, convection, thermal radiation, and nanofluids. The book includes numerous end-of-chapter problems to enhance student understanding and different solving approaches. The book is intended for senior undergraduate mechanical, aerospace, and chemical engineering students taking courses in Heat Transfer.

CRC Press
January 2024 : 534pp
Hb: 978-1-032-54982-8 : £115
eBook: 978-1-032-54993-4 : £105

* For full contents and more information, visit: www.routledge.com/9781032549828

Finite Element Analysis of Solids and Structures



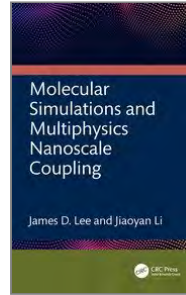
Sudip S. Bhattacharjee

This textbook combines the theory of elasticity (advanced analytical treatment of stress analysis problems) and finite element methods (numerical details of finite element formulations) into one academic course derived from author's teaching, research, and applied work in automotive product development as well as in civil structural analysis. This work contains 12 discrete chapters that can be covered in a single semester university graduate course on linear elastic finite element analysis methods. The book also serves as a reference for practicing engineers working on design assessment and analysis of solids and structures.

CRC Press
October 2024 : 340pp
Pb: 978-1-032-04158-2 : **£45.99**
Hb: 978-0-367-43705-3 : **£110**
eBook: 978-1-003-02784-3

* For full contents and more information, visit: www.routledge.com/9781032041582

Molecular Simulations and Multiphysics Nanoscale Coupling



James D. Lee George Washington University, USA,
Jiaoyan Li University at Buffalo, USA

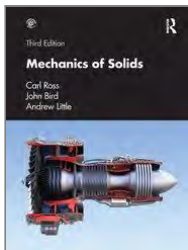
This focuses on the theoretical foundations and numerical methods for the studying the behavior of materials and the coupling of mechanical, thermal, and electromagnetic fields at the nanoscale. It covers the Principle of Objectivity, the coupling of mechanics, thermal science, and electromagnetics, it presents Sequential and Concurrent Multiscale Modeling and CGMD to apply multiscale modeling to the behaviors of materials at nanoscale. It applies analytical and numerical simulation to fracture mechanics at the microscopic level. It suits advanced undergraduate and graduate engineering courses for solid mechanics, fluid mechanics, material science, and chemical engineering.

CRC Press
August 2025 : 200pp
Hb: 978-1-032-55678-9 : **£96.99**

* For full contents and more information, visit: www.routledge.com/9781032556789

3RD EDITION

Mechanics of Solids



Carl Ross Professor of Structural Dynamics, University of Portsmouth, UK, **John Bird**, **Andrew Little**

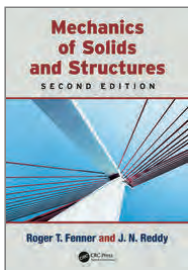
This introduction to the behaviour of solid materials under loading, focuses on statics and stress analysis. As the primary recommended mechanics of solids text of the Council of Engineering Institutions for undergraduates, it covers practical stress and strain scenarios including simple stress and strain, torsion, bending, elastic failure and buckling, with examples such as thin-walled structures, beams, struts and composite structures. New chapters cover matrix algebra, fracture mechanics, and additional material considerations including creep and fatigue. The companion website offers solutions, and multiple-choice tests; and resources for adopting course instructors.

Routledge
November 2021 : 518pp
Pb: 978-0-367-65140-4 : **£58.99**
Hb: 978-0-367-65141-1 : **£150**
eBook: 978-1-003-12802-1

* For full contents and more information, visit: www.routledge.com/9780367651404

2ND EDITION

Mechanics of Solids and Structures



Roger T. Fenner Imperial College London, UK, **J.N. Reddy** Texas A&M University, College Station, USA

Series: Applied and Computational Mechanics

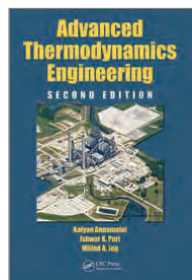
A revision of a popular textbook, this volume emphasizes the development of analysis techniques from basic principles for a broad range of practical problems, including simple structures, pressure vessels, beams, and shafts. The book integrates numerical and computer techniques with programs for carrying out analyses, facilitating design, and solving the problems found at the end of each chapter. It also presents the underlying theory and traditional manual solution methods along with these techniques. This new second edition covers relationships between stress and strain, torsion, statically determinate systems, instability of struts and columns, and compatibility equations.

CRC Press
June 2012 : 705pp
Hb: 978-1-439-85814-1 : **£130**
eBook: 978-0-429-09736-2

* For full contents and more information, visit: www.routledge.com/9781439858141

2ND EDITION

Advanced Thermodynamics Engineering



Kalyan Annamalai Texas A&M University, College Station, USA, **Ishwar K. Puri** Virginia Polytechnic Institute and State University, Blacksburg, USA, **Milind A. Jog** University of Cincinnati, Ohio, USA

Series: Applied and Computational Mechanics

Designed for readers who need to understand and apply the engineering physics of thermodynamic concepts, this volume features physical explanations along with mathematical equations so that the principles can be applied to real-world problems. Employing almost 300 illustrations to enhance clarity, the book first presents the phenomenological approach to a problem and then delves into the details. Using a self-teaching format, the authors forego esoteric material in favor of concrete examples and applications. The book includes several tables containing thermodynamic properties and other useful information, and additional material is available for download.

CRC Press

March 2011 : 1144pp

Hb: 978-1-439-80572-5 : £175

eBook: 978-0-429-19157-2

* For full contents and more information, visit: www.routledge.com/9781439805725

2ND EDITION

Automotive Accident Reconstruction

Practices and Principles, Second Edition

**Donald E. Struble , John D. Struble***Series: Ground Vehicle Engineering*

This fully updated edition presents practices and principles applicable for the reconstruction of automobile and commercial truck crashes. Like the First Edition, it starts at the very beginning with fundamental principles, information sources, and data gathering and inspection techniques for accident scenes and vehicles. It goes on to show how to analyze photographs and crash test data. The book presents tire fundamentals and shows how to use them in spreadsheet-based reverse-trajectory analysis.

CRC Press

February 2020 : 421pp

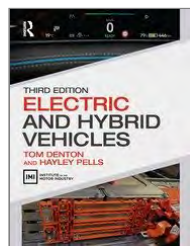
Hb: 978-0-367-41583-9 : **£130**

eBook: 978-1-003-00897-2

* For **full contents** and more information, visit: www.routledge.com/9780367415839

3RD EDITION

Electric and Hybrid Vehicles



Tom Denton Technical Consultant, Institute of the Motor Industry (IMI), UK, **Hayley Pells** Avia Sports Cars Ltd, UK

Endorsed by the Institute of the Motor Industry, this full colour textbook introduces the subject for further education and undergraduate students, technicians, and drivers. This edition is extensively updated, especially regarding batteries, charging and the high voltage pathway, and with new case studies and illustrations. It covers the different types of hybrid and electric vehicle, costs and emissions, and the charging infrastructure, before explaining how the vehicles work, plus the maintenance and repair procedures. It particularly suits students studying for IMI Levels 2, 3 and 4 Awards in Hybrid Electric Vehicles, IMI Accreditation, C&G and all other EV/Hybrid courses.

Routledge

January 2024 : 260pp

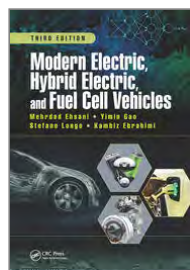
Pb: 978-1-032-55679-6 : **£39.99**Hb: 978-1-032-55680-2 : **£100**

eBook: 978-1-003-43173-2

* For full contents and more information, visit: www.routledge.com/9781032556796

3RD EDITION

Modern Electric, Hybrid Electric, and Fuel Cell Vehicles



Mehrdad Ehsani Texas A&M University, College Station, USA, **Yimin Gao** Advanced Vehicle Research Center, Danville, Virginia, USA, **Stefano Longo** Cranfield University, UK, **Kambiz Ebrahimi** Loughborough University, UK

The book deals with the fundamentals, theoretical bases, and design methodologies of conventional internal combustion engine (ICE) vehicles, electric vehicles (EVs), hybrid electric vehicles (HEVs), and fuel cell vehicles (FCVs). The design methodology is described in mathematical terms, step-by-step, and the topics are approached from the overall drive train system, not just individual components. Furthermore, in explaining the design methodology of each drive train, design examples are presented with simulation results.

CRC Press

February 2018 : 572pp

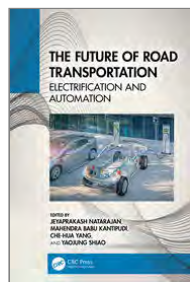
Hb: 978-1-498-76177-2 : **£145**IEPB: 978-1-138-33049-8 : **£55**

eBook: 978-0-429-50488-4

* For full contents and more information, visit: www.routledge.com/9781498761772

The Future of Road Transportation

Electrification and Automation



Edited by **Jeyapraakash Natarajan** China University of Mining and Technology, China, **Mahendra Babu Kantipudi** National Taipei University of Technology, Taiwan, **Che-Hua Yang** National Taipei University of Technology, Taiwan, **Yaojung Shiao** National PingTung University of Science and Technology, Taiwan

The Future of Road Transportation presents rapidly growing research towards electrified and automated vehicles. It explains the workings and drawbacks of a conventional vehicle's powertrain, braking, and steering systems before exploring ADAS equipment and driverless car technologies. The book is intended for automotive and electrical engineers and researchers working on electric vehicle technology, autonomous and automated vehicles, automotive sustainability. It will also be useful for mechanical and electrical engineering students taking courses in Automotive/Vehicle Engineering and Automotive Systems and Design.

CRC Press

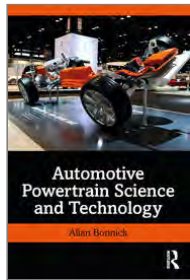
November 2023 : 322pp

Hb: 978-1-032-40833-0 : **£120**

eBook: 978-1-003-35490-1

* For full contents and more information, visit: www.routledge.com/9781032408330

Automotive Powertrain Science and Technology



Allan Bonnick

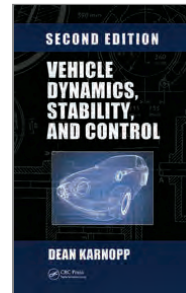
A motor vehicle's powertrain consists of the components which generate power and enable it to move – its engine, exhaust system, transmission, drive shaft, suspension and wheels. Any automotive engineering student going beyond basic mechanics will need a sound knowledge of the mathematics and scientific principles, particularly calculus and algebra, which underpin powertrain technology. This textbook supports a series of courses, for instance BTEC unit 28 "Further Mathematics for Engineering Technicians", and BTEC higher unit 25 "Engine and Vehicle Design and Performance", without giving full coverage of automotive technology.

Routledge
March 2020 : 208pp
Pb: 978-0-367-33113-9 : **£45.99**
Hb: 978-0-367-33111-5 : **£91.99**
eBook: 978-0-429-31802-3

* For full contents and more information, visit: www.routledge.com/9780367331139

2ND EDITION

Vehicle Dynamics, Stability, and Control



Dean Karnopp University of California, Davis, USA

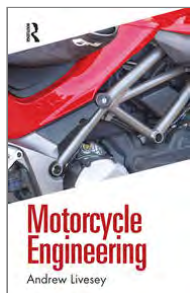
Series: Mechanical Engineering

The second edition of a bestseller, this book applies basic dynamics concepts to vehicle dynamics and stability. It covers a wide range of vehicles - autos and other ground vehicles, railroad locomotives and cars, and aerospace vehicles. The author presents and develops mathematical models with numerous worked examples and careful explanations brought in to explain and demonstrate the equations of motion; and applied engineering situations to show practical applications. It includes chapter problems and a Solutions Manual is available to qualified adopting professors. Bond graph methods are covered in an appendix.

CRC Press
January 2013 : 326pp
Hb: 978-1-466-56085-7 : **£175**
eBook: 978-0-429-09682-2

* For full contents and more information, visit: www.routledge.com/9781466560857

Motorcycle Engineering



Andrew Livesey

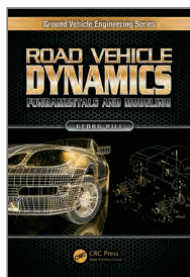
Motorcycle Engineering is written to give the reader a good all-round knowledge of how a motorcycle works. The complex engineering behind the machines is explained in easy-to-understand terms and supported by 350 images. It covers a range of motorcycle types, and will be particularly useful for students on motorcycle and motorsport courses such as those run by the IMI and City & Guilds, as well as BTEC programmes, and will serve as an excellent introductory text for HND and degree students on automotive type programmes.

Routledge
April 2021 : 380pp
Pb: 978-0-367-41919-6 : **£47.99**
Hb: 978-0-367-41920-2 : **£135**
eBook: 978-0-367-81685-8

* For full contents and more information, visit: www.routledge.com/9780367419196

Road Vehicle Dynamics

Fundamentals and Modeling



Georg Rill University of Applied Sciences, Regensburg, Germany

Series: Ground Vehicle Engineering

Presenting the terminology of automotive engineering, this book introduces the basic mechanics and analytical methods used in vehicle dynamics. The text provides insight into tire force and torque generation and surveys the components of drive train and suspension systems. It also covers the fundamentals of vehicle dynamics and includes a tire model, as well as dynamic models of force elements. Using simple vehicle models, the author provides a deeper understanding of the dynamics of road vehicles. Many MATLAB® examples are used to verify theoretical predictions. Electronic lecture notes and a full solutions manual are available with qualifying course adoption.

CRC Press
September 2011 : 362pp
Hb: 978-1-439-83898-3 : **£130**
eBook: 978-0-429-18452-9

* For full contents and more information, visit: www.routledge.com/9781439838983

3RD EDITION

Automobile Mechanical and Electrical Systems



Tom Denton Technical Consultant, Institute of the Motor Industry (IMI), UK, **Hayley Pells** Avia Sports Cars Ltd, UK

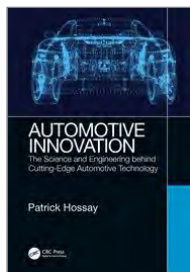
This concentrates on core technologies of how new vehicle systems work, from the engine through to the chassis and electronics. Now with fresh coverage of HVAC (heating, ventilation and air conditioning), water pumps, thermal management, EV/HV awareness, safety management and hygiene, occupant restraints, and lighting systems. It outlines the necessary tools and equipment for effective car maintenance and repair in full colour with copious photographs, diagrams, flow charts and quick reference tables with definitions, key facts and 'safety first' considerations and is supported by the author's website www.automotive-technology.org

Routledge
November 2022 : 420pp
Pb: 978-1-032-28908-3 : **£33.99**
Hb: 978-1-032-28909-0 : **£96.99**
eBook: 978-1-003-29906-6

* For full contents and more information, visit: www.routledge.com/9781032289083

Automotive Innovation

The Science and Engineering behind Cutting-Edge Automotive Technology



Patrick Hossay Stockton University, NJ, USA

Series: Ground Vehicle Engineering

Automotive Innovation: The Science and Engineering behind Cutting-Edge Automotive Technology provides a survey of innovative automotive technologies in the industry. Automobiles are rapidly changing, and this text explores these trends. IC engines, transmissions, and chassis are being improved, and there are breakthroughs in digital control, manufacturing, and materials. New vehicles demonstrate improved performance, safety and efficiency factors; and electric vehicles represent a new alternative; sensing technologies and computer processors redefine the nature of driving. The text explores these changes, the engineering and science behind them, and directions for the future.

CRC Press
July 2019 : 323pp
Hb: 978-1-138-61176-4 : **£96.99**
eBook: 978-0-429-46499-7

* For full contents and more information, visit: www.routledge.com/9781138611764

2ND EDITION

Automotive Technician Training: Theory



Tom Denton Technical Consultant, Institute of the Motor Industry (IMI), UK, **Hayley Pells** Avia Sports Cars Ltd, UK

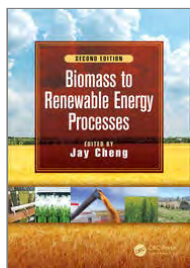
Automotive Technician Training is the definitive textbook for automotive engineering. Produced alongside the ATT online learning resources, this textbook covers all the theory and technology sections that students need to learn in order to pass levels 1, 2 and 3 automotive courses. It is recommended by the Institute of the Motor Industry and is ideal for exams run by other awarding bodies. The revised edition overhauls the coverage of workshop skills and advanced diagnostic techniques. It also includes a new chapter about electric and hybrid vehicles and advanced driver-assistance systems, along with new online learning activities.

Routledge
September 2021 : 578pp
Pb: 978-1-032-00220-0 : **£39.99**
Hb: 978-1-032-00233-0 : **£110**
eBook: 978-1-003-17323-6

* For full contents and more information, visit: www.routledge.com/9781032002200

2ND EDITION

Biomass to Renewable Energy Processes



Edited by **Jay Cheng** North Carolina State University, Raleigh, USA

Biomass to Renewable Energy Processes, Second Edition, explains the theories of biological processes, biomass materials and logistics, and conversion technologies for bioenergy products such as biogas, ethanol, butanol, biodiesel, and synthetic gases. The book discusses anaerobic digestion of waste materials for biogas and hydrogen production, bioethanol and biobutanol production from starch and cellulose, and biodiesel production from plant oils. It addresses thermal processes, including gasification and pyrolysis of agricultural residues and woody biomass. The text also covers pretreatment technologies, enzymatic reactions, fermentation, and microbiological metabolisms and pathways.

CRC Press

October 2017 : 450pp

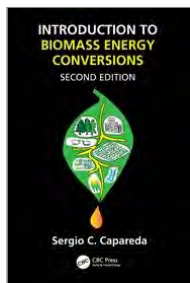
Hb: 978-1-498-77879-4 : £130

eBook: 978-1-315-15286-8

* For full contents and more information, visit: www.routledge.com/9781498778794

2ND EDITION

Introduction to Biomass Energy Conversions



Sergio Capareda Texas A&M University, College Station, USA

Introduction to Biomass Energy Conversions explores biomass energy conversions and characterization using practical examples and real-world scenarios. It begins with biomass resource estimation and extends to commercialization pathways for economical biomass conversion into high value materials, chemicals, and fuels. The book is intended for senior undergraduate students taking Renewable Energy Conversions, Bio Energy, Biomass Energy, Introduction to Biofuels, and Sustainability Engineering courses. The book features end-of-chapter problems, exercises, and case studies with a Solutions Manual available for instructors.

CRC Press

November 2023 : 572pp

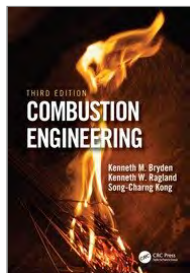
Hb: 978-1-032-27833-9 : £125

eBook: 978-1-032-27855-1 : £115

* For full contents and more information, visit: www.routledge.com/9781032278339

3RD EDITION

Combustion Engineering



Kenneth Bryden , Kenneth W. Ragland University of Wisconsin, Madison, USA, **Song-Chang Kong**

Combustion Engineering, Third Edition introduces the analysis, design, and building of combustion energy systems. It discusses current global energy, climate, and air pollution challenges and considers the increasing importance of renewable energy sources, such as biomass fuels. This text is intended for undergraduate and first-year graduate mechanical engineering students taking introductory courses in combustion. Practicing heating engineers, utility engineers, and engineers consulting in energy and environmental areas will find this book a useful reference. Instructors will be able to utilize an updated Solutions Manual and figure slides for their course.

CRC Press

May 2022 : 492pp

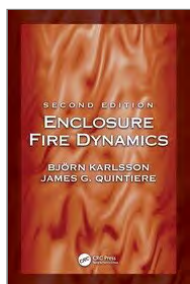
Hb: 978-1-138-06538-3 : £135

eBook: 978-1-315-15972-0

* For full contents and more information, visit: www.routledge.com/9781138065383

2ND EDITION

Enclosure Fire Dynamics, Second Edition



Björn Karlsson , James G. Quintiere University of Maryland, College Park, USA

Enclosure Fire Dynamics, Second Edition explores the science of enclosure fires, and how they cause changes in the environment. The authors discuss mechanisms for controlling enclosure fires, and how to develop analytical relationships useful in designing buildings for fire safety. Derivation of equations from first principles is shown, stating assumptions and showing comparisons to experimental data. The text provides readers with the skills needed to solve a range of engineering equations and models. Enclosure Fire Dynamics, Second Edition will enhance the knowledge of fire protection engineers, researchers, and investigators, and help build a strong foundation for engineering students.

CRC Press

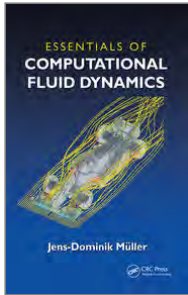
June 2022 : 384pp

Hb: 978-1-138-05866-8 : £120

eBook: 978-1-315-16381-9

* For full contents and more information, visit: www.routledge.com/9781138058668

Essentials of Computational Fluid Dynamics



Jens-Dominik Müller Queen Mary University of London, England, UK

Approaching the material from the viewpoint of a user of a commercial flow package, this book initially limits the description of the mathematics to the level that is strictly needed to make the correct choices when setting up a case in a commercial flow solver. It discusses the sources of errors in FD solutions using simple examples with finite differences, and they are demonstrated with mesh convergence studies. It focuses on the understanding of how the flow physics interact with a typical finite-volume discretization.

CRC Press

November 2015 : 238pp

Pb: 978-1-482-22730-7 : **£96.99**

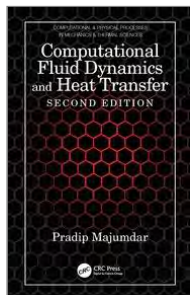
Hb: 978-1-138-40130-3 : **£175**

eBook: 978-0-429-18868-8

* For full contents and more information, visit: www.routledge.com/9781482227307

2ND EDITION

Computational Fluid Dynamics and Heat Transfer



Pradip Majumdar Northern Illinois University, DeKalb, USA

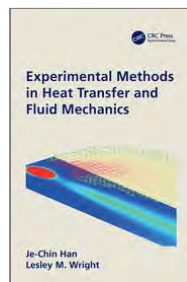
Series: Computational & Physical Processes in Mechanics & Thermal Scienc

This book provides a thorough understanding of fluid dynamics and heat and mass transfer. It contains new chapters on mesh generation and computational modeling of turbulent flow. Combining theory and practice in classic problems and computer code, the text includes examples in ANSYS, STAR CCM+, and COMSOL. The text will be valuable to Engineering instructors and students taking courses in computational heat transfer and computational fluid dynamics. With detailed explanations on how to implement computational methodology into a computer code, students will be able to solve complex problems on their own, including problems in heat transfer, mass transfer, and fluid flows.

CRC Press
December 2021 : 696pp
Hb: 978-1-498-70374-1 : £150
eBook: 978-0-429-18300-3

* For full contents and more information, visit: www.routledge.com/9781498703741

Experimental Methods in Heat Transfer and Fluid Mechanics



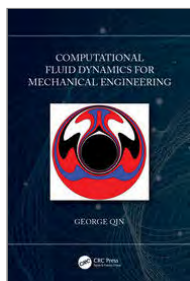
Je-Chin Han , Lesley Wright

Experimental Methods in Heat Transfer and Fluid Mechanics focuses on how to analyze and solve the classic heat transfer and fluid mechanics measurement problems in one volume. This work serves the need of graduate students and researchers looking for advanced measurement techniques for thermal, flow, and heat transfer engineering applications. The text focuses on analyzing and solving classic heat transfer and fluid mechanics measurement problems, emphasizing fundamental principles, measurement techniques, data presentation and uncertainty analysis. Overall, the text builds a strong and practical background for solving complex engineering heat transfer and fluid flow problems.

CRC Press
February 2022 : 382pp
Pb: 978-0-367-49780-4 : £39.99
Hb: 978-0-367-89792-5 : £105
eBook: 978-1-003-02117-9

* For full contents and more information, visit: www.routledge.com/9780367497804

Computational Fluid Dynamics for Mechanical Engineering



George Qin Cedarville University, USA

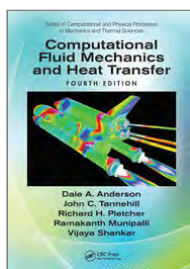
This textbook presents the basic methods, numerical schemes, and algorithms of computational fluid dynamics (CFD). Readers will learn to compose MATLAB® programs to solve realistic fluid flow problems. The textbook was written for a first course in computational fluid dynamics (CFD) taken by undergraduate students in a Mechanical Engineering major. Newer research results on stability and boundedness of various numerical schemes are incorporated. The book emphasizes large eddy simulation (LES) in the chapter on turbulent flow simulation besides the two-equation models. Volume of fraction (VOF) and related methods will be the focus of the chapter on two-phase flows.

CRC Press
October 2024 : 384pp
Pb: 978-0-367-68730-4 : £45.99
Hb: 978-0-367-68729-8 : £86.99
eBook: 978-1-003-13882-2

* For full contents and more information, visit: www.routledge.com/9780367687304

4TH EDITION

Computational Fluid Mechanics and Heat Transfer



Dale Anderson University of Texas at Arlington, USA,
John C. Tannehill Iowa State University, Ames, USA,
Richard H. Pletcher Iowa State University, USA,
Ramakanth Munipalli U.S. Air Force Research Laboratory (Edwards AFB), USA, **Vijaya Shankar** HyPerComp, Inc., USA

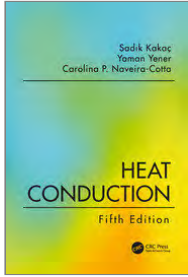
Series: Computational and Physical Processes in Mechanics and Thermal Sciences

This book is a fully updated version of the classic text on finite-difference and finite-volume computational methods. As an introductory text for advanced undergraduates and first-year graduate students, the new edition provides the background necessary for solving complex problems in fluid mechanics and heat transfer. Divided into two parts, the text covers essential concepts in the first part, and then moves on to fluids equations in the second. Designed as a valuable resource for practitioners and students, new examples and homework problems have been added to further enhance the student's understanding of the fundamentals and applications.

CRC Press
December 2020 : 974pp
Hb: 978-0-815-35712-4 : £135
eBook: 978-1-351-12402-7

* For full contents and more information, visit: www.routledge.com/9780815357124

5TH EDITION

Heat Conduction, Fifth Edition

Sadık Kakac , Yaman Yener , Carolina P. Naveira-Cotta Universidade Federal do Rio de Janeiro, Brazil

Heat Conduction, Fifth Edition, upholds its reputation as the leading text in the field for graduate students, and as a resource for practicing engineers. The text begins with fundamental concepts, introducing the governing equation of heat conduction, and progresses through solutions for one-dimensional conduction, orthogonal functions, Fourier series and transforms, and multidimensional problems. Integral equations, Laplace transforms, finite difference numerical methods, and variational formulations are then covered. Nanoscale conductive heat transfer coverage has been added in this new edition, along with new and revised problems, and complete problem solutions for instructors.

CRC Press

July 2018 : 542pp

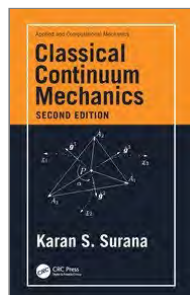
Hb: 978-1-138-94384-1 : £165

eBook: 978-1-315-17871-4

* For full contents and more information, visit: www.routledge.com/9781138943841

2ND EDITION

Classical Continuum Mechanics



Karan S. Surana University of Kansas, USA

Series: Applied and Computational Mechanics

Updated throughout for the second edition, the book adds new material aimed at defining classical continuum mechanics, discussing its limitations, and illustrating key concepts. New to the second edition is a chapter on advanced topics in classical continuum mechanics, defining and illustrating the type of physics that can be considered under calculus of variations and energy methods. Placing special emphasis on both matrix and vector notations, it presents material using these notations whenever possible.

CRC Press

December 2024 : 532pp

Pb: 978-0-367-61521-5 : **£45.99**

Hb: 978-0-367-61296-2 : **£120**

eBook: 978-1-003-10533-6

* For full contents and more information, visit: www.routledge.com/9780367615215

4TH EDITION

Continuum Mechanics for Engineers



G. Thomas Mase California Polytechnic State University, San Luis Obispo, USA, **Ronald E. Smelser** University of North Carolina, Charlotte, USA, **Jenn Stroud Rossmann** Lafayette College, Easton, Pennsylvania, USA

Series: Applied and Computational Mechanics

A bestselling textbook in its first three editions, Continuum Mechanics for Engineers, Fourth Edition provides engineering students with a complete, concise, and accessible introduction to advanced engineering mechanics. It provides information that is useful in emerging engineering areas, such as micro-mechanics and biomechanics. Through a mastery of this volume's contents and additional rigorous finite element training, readers will develop the mechanics foundation necessary to skilfully use modern, advanced design tools.

CRC Press

May 2020 : 450pp

Hb: 978-1-482-23868-6 : **£120**

eBook: 978-0-429-17439-1

* For full contents and more information, visit: www.routledge.com/9781482238686

Control Systems

Classical, Modern, and AI-Based Approaches



Jitendra R. Raol Ramaiah Institute of Technology, India,
Ramakalyan Ayyagari National Institute of Technology
(NIT), India

This book provides a broad and comprehensive study of the principles, mathematics, and applications for studying basic control in Mechanical, Electrical, Aerospace, and other engineering disciplines. The text builds a strong mathematical foundation of control theory, introducing linear, non-linear, digital, optimal, and robust control systems, and builds upon that foundation to address applications in emerging areas such as unmanned aircraft systems, robotic systems, and spacecraft. Numerical coverage with MATLAB® is integrated, and numerous examples and exercises are included in each chapter; and MATLAB® code will be available.

CRC Press

July 2019 : 668pp

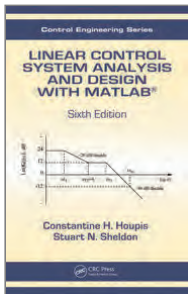
Hb: 978-0-815-34630-2 : £140

eBook: 978-1-351-17080-2

* For full contents and more information, visit: www.routledge.com/9780815346302

6TH EDITION

Linear Control System Analysis and Design with MATLAB®



Constantine H. Houppis Air Force Institute of
Technology, Wright-Patterson AFB, Ohio, USA, **Stuart N.
Sheldon** US Nuclear Regulatory Commission, Lisle,
Illinois, USA

Series: Automation and Control Engineering

This book uses numerous in-depth explanations, diagrams, calculations, and tables to provide an intensive overview of modern control theory and control system design. Mathematics is kept to a minimum, and engineering applications are stressed throughout. Completely updated and packed with student-friendly features, the sixth edition presents a range of updated examples using MATLAB®, as well as an appendix listing MATLAB functions for optimizing control system analysis and design. Over 75 percent of the problems presented in the previous edition have been revised or replaced.

CRC Press

October 2013 : 729pp

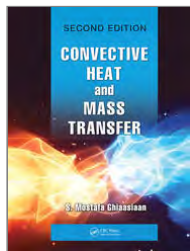
Hb: 978-1-466-50426-4 : £155

eBook: 978-0-429-09619-8

* For full contents and more information, visit: www.routledge.com/9781466504264

2ND EDITION

Convective Heat and Mass Transfer



S. Mostafa Ghiaasiaan Georgia Tech University, Atlanta, USA

Series: Heat Transfer

Convective Heat and Mass Transfer, Second Edition, is ideal for the graduate level study of convection heat and mass transfer, with coverage of well-established theory and practice as well as trending topics such as transpiration cooling, flow in micro-channels, CFD, and diffusion and convection transport of particles. Its broad scope makes the text ideal for both Mechanical and Chemical Engineering, with mass transfer content presented so that it can be easily skipped. Numerous examples and end-of-chapter exercises are included, along with 18 appendices that cover essential property and mathematical information. Solutions and PowerPoint slides are available to qualified instructors.

CRC Press

June 2018 : 652pp

Hb: 978-0-815-36141-1 : £185

eBook: 978-1-351-11275-8

* For full contents and more information, visit: www.routledge.com/9780815361411

3RD EDITION

Convective Heat Transfer



Sadik Kakac TOBB University of Economics and Technology, Ankara, Turkey, **Yaman Yener** Northeastern University, Boston, Massachusetts, USA, **Anchasa Pramuanjaroenkij** Kasetsart University, Sakon Nakhon, Thailand

With clear, concise coverage of the basics of convection, this textbook is written for senior/graduate students, from mechanical and other engineering majors, who have taken a basic heat transfer course. Balancing basic concepts with engineering applications, the new edition is ideal for those wanting to learn more heat transfer for research work and advanced coursework. Convective heat transfer is important for many areas, including biomedical applications and energy technologies. This third edition features a complete new chapter on microscale and nanoscale convective heat transfer, and more coverage of numerical/computer methods.

CRC Press

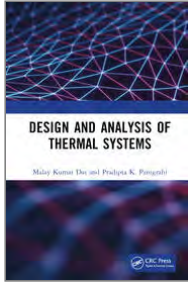
December 2013 : 622pp

Hb: 978-1-466-58344-3 : £175

eBook: 978-0-429-10290-5

* For full contents and more information, visit: www.routledge.com/9781466583443

Design and Analysis of Thermal Systems



Malay Kumar Das IIT Kanpur, India, **Pradipta K. Panigrahi** IIT Kanpur, India

Thermal systems are essential features of all domestic and industrial applications involving heat and fluid flow and focus of the proposed book is on the design of thermal systems. The proposed book bridges the gap between the theories of thermal science and design of practical thermal systems. Further, it discusses thermodynamic design principle, mathematical and CFD tools that will enable students as well as professional engineers to quickly analyse and design practical thermal systems. The major emphasis is on practical problems related to contemporary energy- and environment-related thermal systems including discussion of computational fluid dynamics used in thermal system design.

CRC Press

May 2023 : 424pp

Hb: 978-0-367-50254-6 : £135

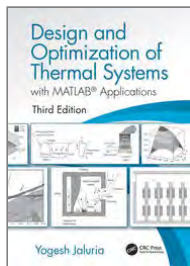
eBook: 978-1-003-04927-2

* For full contents and more information, visit: www.routledge.com/9780367502546

3RD EDITION

Design and Optimization of Thermal Systems, Third Edition

with MATLAB Applications



Yogesh Jaluria Rutgers University, Piscataway, New Jersey, USA.

Series: Mechanical Engineering

Providing systematic approaches to thermal systems design, *Design and Optimization of Thermal Systems, Third Edition*, delivers the guidance needed to solve design problems. It presents concepts and procedures for conceptual design, formulation, modeling, simulation, feasible design, and optimization. Emphasizing modeling and simulation, the Third Edition covers the areas of manufacturability, material selection, and sensitivity, genetic and gradient search methods, and knowledge-based design methodology. This edition also features many new and revised examples and problems, and coverage of computer design analysis with MATLAB.

CRC Press

September 2019 : 614pp

Hb: 978-1-498-77823-7 : £115

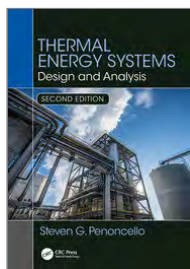
eBook: 978-0-429-08578-9

* For full contents and more information, visit: www.routledge.com/9781498778237

2ND EDITION

Thermal Energy Systems

Design and Analysis, Second Edition



Steven G. Penoncello University of Idaho, Moscow, USA

Thermal Energy Systems: Design and Analysis, Second Edition presents basic concepts for simulation and optimization, and introduces simulation and optimization techniques for system modeling. This text addresses engineering economy, optimization, hydraulic systems, energy systems, and system simulation. Computer modeling is presented, and a companion website provides specific coverage of EES and Excel in thermal-fluid design. Assuming prior coursework in basic thermodynamics and fluid mechanics, this fully updated and improved text will guide students in Mechanical and Chemical Engineering as they apply their knowledge to systems analysis and design, and to capstone design project work.

CRC Press

October 2018 : 623pp

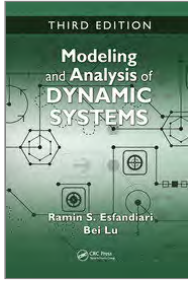
Hb: 978-1-138-73589-7 : £155

eBook: 978-1-315-18626-9

* For full contents and more information, visit: www.routledge.com/9781138735897

3RD EDITION

Modeling and Analysis of Dynamic Systems



Ramin S. Esfandiari California State University, Long Beach, USA, **Bei Lu** California State University, Long Beach, USA, **Bei Lu**

Modeling and Analysis of Dynamic Systems, Third Edition introduces MATLAB®, Simulink®, and Simscape™ and then utilizes them to perform symbolic, graphical, numerical, and simulation tasks. Written for senior level courses/modules, the textbook meticulously covers techniques for modeling a variety of engineering systems, methods of response analysis, and introductions to mechanical vibration, and to basic control systems. These features combine to provide students with a thorough knowledge of the mathematical modeling and analysis of dynamic systems. The Third Edition now includes Case Studies, expanded coverage of system identification, and updates to the computational tools included.

CRC Press

February 2018 : 617pp

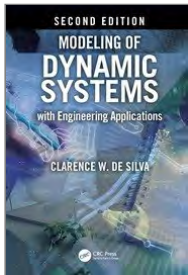
Hb: 978-1-138-72642-0 : £120

eBook: 978-1-315-19129-4

* For full contents and more information, visit: www.routledge.com/9781138726420

2ND EDITION

Modeling of Dynamic Systems with Engineering Applications



Clarence W. de Silva University of British Columbia, Canada

Providing a clear discussion of system dynamics, the book enables students and professionals to both understand and subsequently model mechanical, thermal, fluid, electrical, and multi-domain systems in a systematic, unified and integrated manner. Concepts of through- and across-variables, and flow- and effort-variables are introduced and applied, alongside tools of modeling and model-representation such as linear graphs, bond graphs, and block diagrams. The book uses and illustrates popular software tools such as SIMULINK, throughout, and additionally makes use of innovative worked examples and case studies, alongside problems and exercises based on practical situations.

CRC Press

July 2022 : 420pp

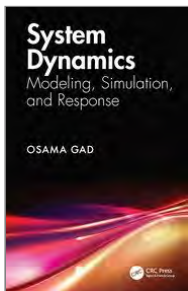
Hb: 978-0-367-64421-5 : £135

eBook: 978-1-003-12447-4

* For full contents and more information, visit: www.routledge.com/9780367644215

System Dynamics

Modeling, Simulation, and Response



Osama Gad

System Dynamics covers linearity-based modeling techniques before delving into nonlinear systems. It compares the Bond Graph technique against traditional techniques (Newton's law, Kirchhoff's law, the law of the conservation of energy, and the heat transfer law). Presenting transient response analyses of first- and second-order systems subjected to various inputs, the book provides a thorough discussion of computational analyses of transient responses using MATLAB®/Simulink and 20-sim software. The book is intended for upper-level undergraduate mechanical and aerospace engineering students taking System Dynamics courses.

CRC Press

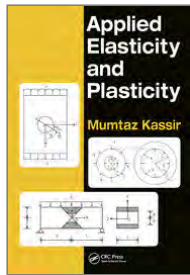
September 2024 : 549pp

Hb: 978-1-032-68563-2 : £110

eBook: 978-1-032-68566-3 : £99.99

* For full contents and more information, visit: www.routledge.com/9781032685632

Applied Elasticity and Plasticity



Mumtaz Kassir

Applied Elasticity and Plasticity is a comprehensive work that introduces graduate students and professionals in civil, mechanical, aeronautical and metallurgical engineering to the basic theories of elasticity, plasticity and their practical applications.

CRC Press

October 2017 : 564pp

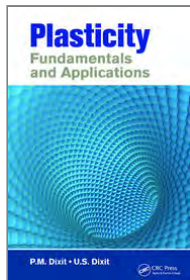
Hb: 978-1-138-06191-0 : £165

eBook: 978-1-315-16199-0

* For full contents and more information, visit: www.routledge.com/9781138061910

Plasticity

Fundamentals and Applications



P.M. Dixit IIT, Kanpur, India, **U.S. Dixit** Indian Institute of Technology, Guwahati, India

All materials undergo some deformation under the application of a load. When the load is removed, a solid material may return to its original state or retain some deformation. Plasticity: Fundamentals and Applications places emphasis on the fundamentals of elastic-plastic deformation. This book includes topics such as stress, strain, constitutive relations, fracture, anisotropy, and contact problems. In addition the text also provides a discussion of updated Lagrangian and Eulerian formulations.

CRC Press

August 2018 : 602pp

Pb: 978-1-138-07496-5 : £54.99

Hb: 978-1-466-50618-3 : £155

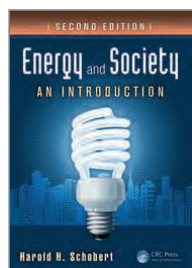
eBook: 978-0-429-17774-3

* For full contents and more information, visit: www.routledge.com/9781138074965

2ND EDITION

Energy and Society

An Introduction, Second Edition

**Harold H. Schobert**

This book covers the development of energy technology from the time of early humans through antiquity, medieval times, and the Industrial Revolution. It addresses the development of nuclear energy, energy supply and demand, geopolitics of energy, and the various environmental issues associated with energy use in general. This edition offers simple updates, as well as completely rewritten material, regarding the last decade in areas including global climate change, oil prices, renewable and alternative fuels, and diversion of civil nuclear energy programs into nuclear weapons proliferation.

CRC Press

March 2014 : 720pp

Pb: 978-1-439-82645-4 : **£91.99**Hb: 978-1-138-42298-8 : **£185**

eBook: 978-0-429-06769-3

* For full contents and more information, visit: www.routledge.com/9781439826454

2ND EDITION

Energy Transition

**Bertrand Cassoret** Université d'Artois, France

This book presents both the importance of energy transition and its associated difficulties and dangers. It discusses the current state of energy consumption and the links between the economy and energy. The book also offers commentary on energy pollution. Reviewing future energy resources, it evaluates several transition scenarios. It will interest engineers working in various fields of energy, producers of fossil, gas, oil, coal, electric, renewable, and nuclear energy. In addition, undergraduate and graduate students studying energy and power should consider the global discussion to develop better processes, from energy sources to production to consumption.

CRC Press

February 2021 : 163pp

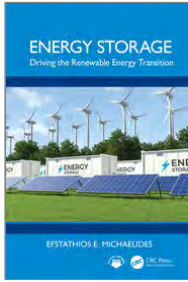
Pb: 978-0-367-54277-1 : **£58.99**Hb: 978-0-367-54278-8 : **£150**

eBook: 978-1-003-08848-6

* For full contents and more information, visit: www.routledge.com/9780367542771

Energy Storage

Driving the Renewable Energy Transition



Efstathios E. Michaelides Texas Christian University, USA

Energy Storage provides a thorough and holistic understanding of the operation and state of technology of all the energy storage options. It encompasses all the methods for energy storage, the engineering systems utilized, and the relevant applications from the small device level to the electricity grid level. Using the basis of thermodynamics, the book explains the operation and features of all the available energy storage methods that may be used for the transition to renewable energy. This book is intended for undergraduate and graduate students taking courses in Energy Conversion, Sustainability, Renewables and Energy Storage, and Energy Transition.

CRC Press

March 2025 : 306pp

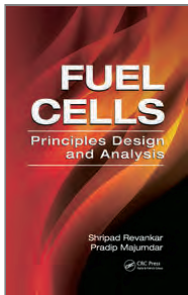
Hb: 978-1-032-46095-6 : £96.99

eBook: 978-1-003-38008-5

* For full contents and more information, visit: www.routledge.com/9781032460956

Fuel Cells

Principles, Design, and Analysis



Shripad T. Revankar Purdue University, West Lafayette, Indiana, **Pradip Majumdar** Northern Illinois University, Dekalb, USA

Series: Mechanical and Aerospace Engineering Series

This resource combines coverage of the basic principles, analysis, analytical techniques, and design aspects of the fuel cell. It presents fuel cell design at component and system levels, and then elaborates on analysis methods for various phenomena associated with components and systems. With its examples, problems, and simulation activities, it makes an excellent graduate text or reference for researchers, engineers, and others involved in energy development. The text guides the reader from foundations and fundamental principles through analysis methods and fuel cell design.

CRC Press

May 2014 : 750pp

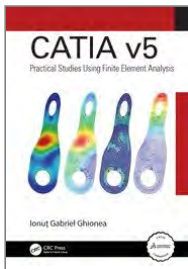
Hb: 978-1-420-08968-4 : £165

eBook: 978-0-429-16243-5

* For full contents and more information, visit: www.routledge.com/9781420089684

CATIA v5

Practical Studies Using Finite Element Analysis



Ionuț Gabriel Ghionea

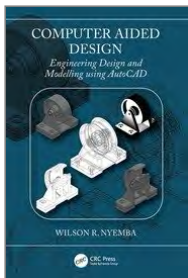
This tutorial textbook presents, through many CAD examples, the main characteristics and working possibilities of the modern CAD software solution CATIA v5 and step by step practical studies for FEM practice. This book is essential reading for students from faculties with a mechanical or industrial engineering profile, as well as production and design engineers from various industries (automotive, military, heavy machinery, medical technology, etc.).

CRC Press
June 2024 : 320pp
Hb: 978-1-032-71164-5 : £130
eBook: 978-1-003-42681-3

* For full contents and more information, visit: www.routledge.com/9781032711645

Computer Aided Design

Engineering Design and Modeling using AutoCAD



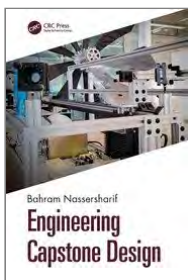
Wilson R Nyemba University of Zimbabwe, Zimbabwe

The text covers different aspects of computer-aided design, from the basic 2-dimensional constructions through modifications, use of layers, and dimensioning to advanced aspects such as 3-dimensional modeling and customization of the package to suit different applications and disciplines. It further discusses important concepts including orthographic projections, isometric projections, 3D wireframe modeling, 3D surface modeling, solid extrusion, and solid of revolution. It will serve as ideal study material for senior undergraduate, and graduate students in the fields of mechanical engineering, industrial engineering, aerospace engineering, and manufacturing engineering.

CRC Press
December 2022 : 314pp
Hb: 978-1-032-26513-1 : £115
eBook: 978-1-032-41885-8 : £115

* For full contents and more information, visit: www.routledge.com/9781032265131

Engineering Capstone Design



Bahram Nassersharif University of Rhode Island, Kingston, USA

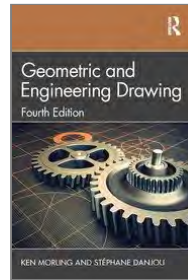
Structured with a practical approach, the book guides engineering students in capstone design projects. The book addresses the challenge of open-ended design projects, often in a team-based format, discussing team member roles, communication, and cooperation. The book will also interest industry professionals, who are engaged in product development or design problem solving. It incorporates accreditation requirements and provides a modern framework for working with industry, reinforced by case studies. The book covers essentials topics and steps in a capstone design sequence, including defining, conceiving, presenting, prototyping, building, testing, and redesigning.

CRC Press
June 2022 : 214pp
Hb: 978-0-367-62159-9 : £96.99
eBook: 978-1-003-10821-4

* For full contents and more information, visit: www.routledge.com/9780367621599

4TH EDITION

Geometric and Engineering Drawing



Ken Morling, Stéphane Danjou Rhine-Waal University of Applied Sciences, Germany

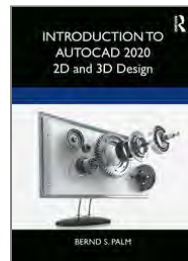
This introduction to descriptive geometry and contemporary drafting guides the student through the essential principles to create engineering drawings that comply with international standards of technical product specification. This heavily updated new edition now applies to CAD as well as conventional drawing. Extensive new coverage is given to international drafting conventions, methods of spatial visualisation such as multi-view projection, dimensional and geometric tolerancing, and representation of workpiece and machine elements. It is ideal for undergraduates in engineering or product design, as well as students of vocational courses in engineering communication.

Routledge
June 2022 : 422pp
Pb: 978-0-367-43123-5 : £45.99
Hb: 978-0-367-43127-3 : £110
eBook: 978-1-003-00138-6

* For full contents and more information, visit: www.routledge.com/9780367431235

Introduction to AutoCAD 2020

2D and 3D Design



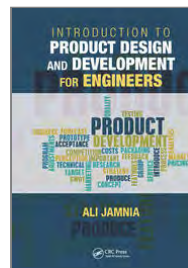
Bernd S. Palm

Master the complexities of the world's bestselling 2D and 3D software with Introduction to AutoCAD 2020. Ideally suited to new users of AutoCAD, this book will be a useful resource for drawing modules in both vocational and introductory undergraduate courses in engineering and construction. Experienced users will also find the updated images, commands and software information to be essential reading in order to adapt to the latest AutoCAD interface. Further education students will find this an invaluable textbook for City & Guilds AutoCAD qualifications, Computer Aided Drawing units of BTEC National Engineering, Higher National Engineering and Construction courses from Edexcel.

Routledge
February 2020 : 436pp
Pb: 978-0-367-41739-0 : £45.99
Hb: 978-0-367-41740-6 : £84.99
eBook: 978-0-367-81602-5

* For full contents and more information, visit: www.routledge.com/9780367417390

Introduction to Product Design and Development for Engineers



Dr. Ali Jamnia

Introduction to Product Design and Development for Engineers provides guidelines and best practices for the design, development, and evaluation of engineered products. Created to serve fourth year undergraduate students in Engineering Design modules with a required project, the text covers the entire product design process and product life-cycle, from the initial concept to the design and development stages, and through to product testing, design documentation, manufacturability, marketing, and sustainability. Reflecting the author's long career as a design engineer, this text will also serve as a practical guide for students working on their capstone design projects.

CRC Press
June 2018 : 446pp
Hb: 978-1-138-55421-4 : £135
eBook: 978-1-315-14893-9

* For full contents and more information, visit: www.routledge.com/9781138554214

The Engineering Design Primer



K. L. Richards

Created to support senior-level courses/modules in product design, K. L. Richard's ENGINEERING DESIGN PRIMER reflects the author's deep experience in engineering product management and design. The combination of specific engineering design processes within the broader context of creative, team-based product design, makes this the ideal resource for project-based coursework. Starting with design concepts and tasks, the text then explores materials selection, optimisation, reliability, statistics, testing, and economic factors- all supported with real-life examples. Student readers will gain a practical perspective of the work they'll be doing as their engineering careers begin.

CRC Press

June 2024 : 324pp

Pb: 978-1-032-83885-4 : **£48.99**

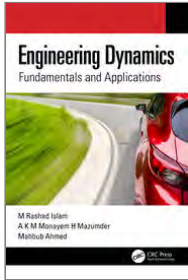
Hb: 978-0-367-21013-7 : **£135**

eBook: 978-0-429-26491-7

* For full contents and more information, visit: www.routledge.com/9781032838854

Engineering Dynamics

Fundamentals and Applications



**M Rashad Islam , A K M Monayem H Mazumder ,
Mahbub Ahmed**

This textbook is intended for the first course of engineering dynamics for undergraduate students. Engineering dynamics is a rigorous topic that typically involves the intensive use of vector mathematics and calculus. This book, however, uses plain language with less vector mathematics and calculus to introduce these topics of mathematics to students with a high school physics background. Numerous practical examples are provided with their step-by-step worked out solutions, as well as case studies to reflect the interests of new engineering and applied engineering students.

CRC Press

November 2024 : 276pp

Pb: 978-1-032-25561-3 : **£45.99**

Hb: 978-1-032-25557-6 : **£105**

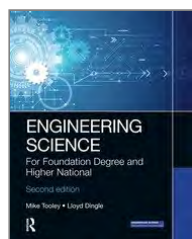
eBook: 978-1-003-28395-9

* For full contents and more information, visit: www.routledge.com/9781032255613

2ND EDITION

Engineering Science

For Foundation Degree and Higher National



Mike Tooley Brooklands College, UK, **Lloyd Dingle**

Engineering Science will help you understand the scientific principles involved in engineering. Focusing primarily upon core mechanical and electrical science topics, students enrolled on an Engineering Foundation degree and Higher National Engineering qualification will find this book an invaluable aid to their learning. The second edition features new chapters on 'Materials, Properties, Testing and Failure' and 'AC Network Analysis' complete with 54 totally new drawings.

Routledge

September 2020 : 528pp

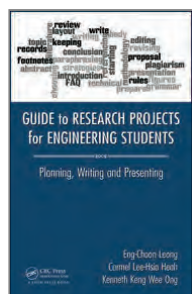
Pb: 978-0-367-43272-0 : **£47.99**Hb: 978-0-367-43273-7 : **£135**

eBook: 978-1-003-00224-6

* For full contents and more information, visit: www.routledge.com/9780367432720

Guide to Research Projects for Engineering Students

Planning, Writing and Presenting



Eng Choon Leong Nanyang Technological University, Singapore, **Carmel Lee-Hsia Heah** Nanyang Technological University, Singapore, **Kenneth Keng Wee Ong** Nanyang Technological University, Singapore

For students embarking on their first research project, sieving through the vast amount of information on the Internet can be a daunting and time consuming task. Research projects require not just understanding of the research methodology, but also complementary skills including information search, technical writing, oral presentation, and software knowledge. This book is written especially for students who need a quick and concise handbook to support them in conducting research so that they can devote most of their time to their research.

CRC Press

July 2015 : 253pp

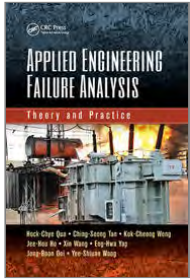
Pb: 978-1-482-23877-8 : **£37.99**Hb: 978-1-138-42428-9 : **£180**

eBook: 978-0-429-15768-4

* For full contents and more information, visit: www.routledge.com/9781482238778

Applied Engineering Failure Analysis

Theory and Practice



Hock-Chye Qua, **Ching-Seong Tan** Multimedia University, Cyberjaya, Selangor, Malaysia, **Kok-Cheong Wong** University of Nottingham-Malaysia Campus, **Jee-Hou Ho** University of Nottingham-Malaysia Campus, **Xin Wang** Monash University - Sunway Campus, Malaysia, **Eng-Hwa Yap** University College London, Australia, **Jong-Boon Ooi** Monash University - Sunway Campus, Malaysia, **Yee-Shiuan Wong**

This book fills the gap between failure analysis theory and the actual conducts of the failure cases. The book demonstrates the main methodologies that have evolved over time and includes examples from the 1970s to date. Engineering calculations and estimation of system stresses and strengths are given in the relevant chapters. It presents a wide range of cases studies, ranging from mechanical engineering, metallurgy, mining, civil/structural engineering, electrical power systems, and radiation damage.

CRC Press

July 2017 : 372pp

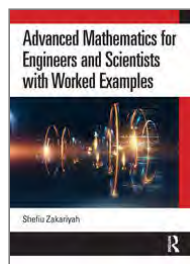
Pb: 978-1-138-74786-9 : **£75.99**

Hb: 978-1-482-22218-0 : **£205**

eBook: 978-0-429-17024-9

* For full contents and more information, visit: www.routledge.com/9781138747869

Advanced Mathematics for Engineers and Scientists with Worked Examples



Shefiu Zakariyah University of Derby, UK

This covers core to advanced topics in mathematics, providing a comprehensive, step-by-step presentation of concepts to engineers, scientists and general readers. It moves from simple to challenging areas, with carefully tailored worked examples also of different degrees of challenge. Mathematical concepts are linked with engineering applications. It is written primarily for students at levels 3 and 4 (typically in the early stages of a degree in engineering or a related discipline) or for those undertaking foundation, access, Higher National Certificate (HND), International Foundation Year (IFY), and International Year One (IYO) courses with math modules.

Routledge

November 2024 : 844pp

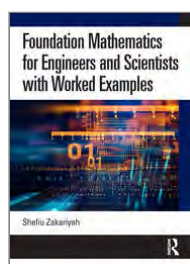
Pb: 978-1-032-66327-2 : **£45.99**

Hb: 978-1-032-66510-8 : **£105**

eBook: 978-1-032-66512-2

* For full contents and more information, visit: www.routledge.com/9781032663272

Foundation Mathematics for Engineers and Scientists with Worked Examples



Shefiu Zakariyah University of Derby, UK

This provides a comprehensive, step-by-step presentation of fundamental mathematical concepts for engineers, scientists, and general readers. It moves from simple to challenging areas, with tailored worked examples. Mathematical concepts are linked with appropriate engineering applications and are aligned with topics taught in major UK and overseas curriculums. It is written primarily for students at levels 3 and 4 (typically in the early stages of a degree in engineering or a related discipline) or for those undertaking foundation, access, Higher National Certificate (HND), International Foundation Year (IFY), and International Year One (IYO) courses with math modules.

Routledge

October 2024 : 610pp

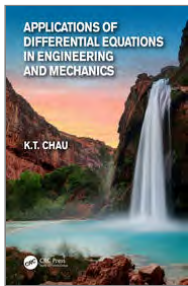
Pb: 978-0-367-46289-5 : **£45.99**

Hb: 978-0-367-46290-1 : **£105**

eBook: 978-1-003-02792-8

* For full contents and more information, visit: www.routledge.com/9780367462895

Applications of Differential Equations in Engineering and Mechanics



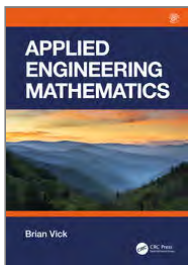
Kam Tim Chau Hong Kong Polytechnic University

This volume gives comprehensive coverage of the essential differential equations students are likely to encounter in solving engineering and mechanics problems - alongside a preliminary companion text on theory. This covers a very broad range of problems, including beams and columns, plates, shells, structural dynamics, catenary and cable suspension bridge, nonlinear buckling, transports and waves in fluids, geophysical fluid flows, nonlinear waves and solitons, Maxwell equations, Schrodinger equations, celestial mechanics and fracture mechanics and dynamics. The focus is on the mathematical technique for solving the differential equations involved.

CRC Press
December 2018 : 830pp
Pb: 978-0-367-02643-1 : **£88.99**
Hb: 978-1-498-76697-5 : **£180**
eBook: 978-0-429-47064-6

* For full contents and more information, visit: www.routledge.com/9780367026431

Applied Engineering Mathematics



Brian Vick Virginia Tech, USA

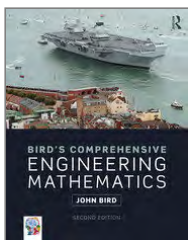
Undergraduate engineering students need good mathematics skills, and this textbook supports this with a strong emphasis on visualization and the methods and tools needed across the whole of engineering. The visual approach is emphasised, and excessive proofs and derivations are avoided. The visual images explain and teach the mathematical methods. The book's website provides dynamic and interactive codes in Mathematica to accompany the examples for the reader to explore on their own.

CRC Press
May 2020 : 246pp
Pb: 978-0-367-43276-8 : **£54.99**
Hb: 978-0-367-43277-5 : **£110**
eBook: 978-1-003-00226-0

* For full contents and more information, visit: www.routledge.com/9780367432768

2ND EDITION

Bird's Comprehensive Engineering Mathematics



John Bird

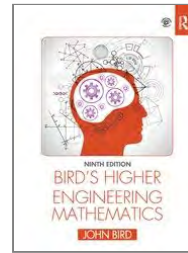
This comprehensive textbook covers the key mathematical principles for real-life engineering problems. Along with its companion website it provides simple explanations, supported by 1600 worked problems and over 3200 further problems contained within 384 exercises throughout the text. With 34 Revision tests together with 9 Multiple-choice tests -- and detailed solutions to 3200 further problems.

Routledge
June 2018 : 1226pp
Pb: 978-0-815-37814-3 : **£53.99**
Hb: 978-0-815-37815-0 : **£150**
eBook: 978-1-351-23287-6

* For full contents and more information, visit: www.routledge.com/9780815378143

9TH EDITION

Bird's Higher Engineering Mathematics



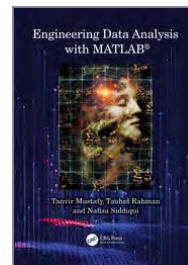
John Bird Defence College of Technical Training, UK

Higher Engineering Mathematics has helped thousands of students to succeed in their exams by developing problem-solving skills. It is supported by over 600 practical engineering examples and applications which relate theory to practice. The extensive and thorough topic coverage makes this a solid text for undergraduate and upper-level vocational courses. Its companion website provides resources for both students and lecturers, including lists of essential formulae, and full solutions to all 2,000 further questions contained in the 277 practice exercises; and illustrations and answers to revision tests for adopting course instructors.

Routledge
March 2021 : 934pp
Pb: 978-0-367-64373-7 : **£47.99**
Hb: 978-0-367-64375-1 : **£110**
eBook: 978-1-003-12422-1

* For full contents and more information, visit: www.routledge.com/9780367643737

Engineering Data Analysis with MATLAB®



Tanvir Mustafy Military Inst. of Science and Tech, BD,
Tauhid Rahman Military Inst. of Science and Tech, BD,
Nafisa Siddiqui Military Inst. of Science and Tech, BD

This book provides a concise overview of a variety of techniques for analyzing statistical, scientific, and financial data, using MATLAB® to integrate several approaches to data analysis and statistics. Chapters offer a broad review of computational data analysis, illustrated with many examples and applications. Each chapter combines theoretical concepts with practical MATLAB® applications and includes practice exercises, ensuring a comprehensive understanding of the material. With coverage of both basic and more complex ideas in applied statistics, the book has broad appeal for undergraduate students up to practicing engineers.

CRC Press
December 2024 : 902pp
Pb: 978-1-032-50771-2 : **£71.99**
Hb: 978-1-032-50658-6 : **£145**
eBook: 978-1-003-39958-2

* For full contents and more information, visit: www.routledge.com/9781032507712

Experimental Statistics and Data Analysis for Mechanical and Aerospace Engineers



James A. Middleton

Series: Advances in Applied Mathematics

This text will introduce students to key concepts in probability and statistics with applications in mechanical and aerospace engineering. Emphasis is placed on modelling variation in observations, characterizing its distribution, and making inferences with regards to quality assurance and control. Fitting multivariate models, experimental design and hypothesis testing are all critical skills developed in the course. All topics are developed utilizing data from engineering projects, simulations, and laboratory experiences. MatLab is used throughout.

Chapman & Hall
November 2021 : 586pp
Hb: 978-0-367-55596-2 : **£105**
eBook: 978-1-003-09422-7

* For full contents and more information, visit: www.routledge.com/9780367555962

2ND EDITION

Fundamentals of Economics for Applied Engineering



S. Kant Vajpayee University of Southern Mississippi, USA,
MD Sarder Bowling Green State University, USA

This one-semester introduction to basic engineering economics provides an overview of the theory and mathematics underlying operational business decisions that engineering technology, engineering, and industrial technology students will face in the workplace. Plain language is used and concepts have been kept straightforward with an emphasis on applying economic principles. Practical examples as throughout the text make good use of Microsoft Excel templates, provided on the book's companion website, for students. Exercises provide discussion and multiple-choice questions along with numerical problems, and a solutions manual and instructor resources is given for adopting instructors.

CRC Press

August 2019 : 470pp

Pb: 978-0-367-18947-1 : £58.99

Hb: 978-0-367-18946-4 : £135

eBook: 978-0-429-19945-5

* For full contents and more information, visit: www.routledge.com/9780367189471

Spreadsheet Problem Solving and Programming for Engineers and Scientists



David E. Clough University of Colorado, USA, **Steven C. Chapra** Tufts University, USA

Beginning with a thorough five chapters on the basics of spreadsheets and programming, the book is well set out, building on the authors' combined decades of experience teaching spreadsheets and programming. Following on from this, three chapters cover engineering economics, key numerical methods, and applied statistics. With each chapter including examples and a set of exercises, the book is an ideal companion for all engineering courses and also for self-study. Based on the latest version of Excel, it is also compatible with earlier versions dating back to 2013. Including case studies, the book will be of interest to students and professionals working in all areas of engineering.

CRC Press

October 2023 : 452pp

Hb: 978-1-032-42053-0 : £100

eBook: 978-1-003-36105-3

* For full contents and more information, visit: www.routledge.com/9781032420530

Theory of Differential Equations in Engineering and Mechanics



Kam Tim Chau Hong Kong Polytechnic University

This volume gives comprehensive coverage of the essential differential equations students are likely to encounter in solving engineering and mechanics problems-- with its advanced companion text on applications. This covers a very broad range of theories related to solving differential equations, mathematical preliminaries, ODE (n-th order and system of 1st order ODE in matrix form), PDE (1st order, 2nd, and higher order including wave, diffusion, potential, biharmonic equations and more)--plus rarer material such as Green's function, integrodifferential equations, asymptotic expansion and perturbation, calculus of variations, variational principles, finite difference method.

CRC Press

September 2017 : 1000pp

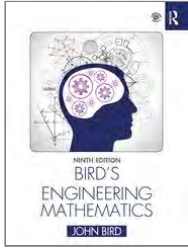
Pb: 978-1-138-74813-2 : £90.99

Hb: 978-1-498-76778-1 : £165

eBook: 978-1-315-16493-9

* For full contents and more information, visit: www.routledge.com/9781138748132

9TH EDITION

Bird's Engineering Mathematics**John Bird** Defence College of Technical Training, UK

Engineering Mathematics has helped thousands of students to succeed in their exams, using worked examples and interactive problems. Mathematics is explained in a straightforward manner, supported by over 550 practical engineering examples and applications which relate theory to practice. This is a great text for a range of Level 2 and 3 engineering courses, and for A level revision. Its companion website provides resources for both students and lecturers, including lists of essential formulae and multiple-choice tests and full solutions for all 1900 further questions; and illustrations and answers to revision tests for adopting course instructors.

Routledge

March 2021 : 758pp

Pb: 978-0-367-64378-2 : **£45.99**Hb: 978-0-367-64379-9 : **£110**

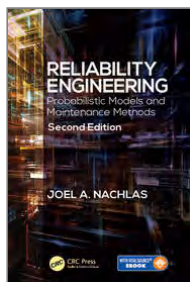
eBook: 978-1-003-12423-8

* For full contents and more information, visit: www.routledge.com/9780367643782

2ND EDITION

Reliability Engineering

Probabilistic Models and Maintenance Methods, Second Edition



Joel A. Nachlas Virginia Polytechnic Institute and State University, Department of Industrial & Systems Engineering, Blacksburg, USA

Without proper reliability and maintenance planning, even the most efficient and seemingly cost-effective designs can incur enormous expenses due to repeated or catastrophic failure and subsequent search for the cause. Today's engineering students face increasing pressure from employers, customers, and regulators to produce cost-efficient designs that are less prone to failure and that are safe and easy to use. An understanding of reliability principles and maintenance planning can help accomplish these goals. With a blend of mathematical rigor and readability, this book is the ideal introductory textbook for graduate students.

CRC Press

December 2016 : 394pp

Hb: 978-1-498-75247-3 : £145

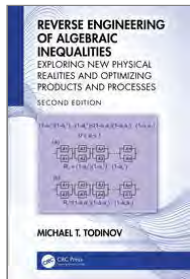
eBook: 978-1-315-30759-6

* For full contents and more information, visit: www.routledge.com/9781498752473

2ND EDITION

Reverse Engineering of Algebraic Inequalities

Exploring New Physical Realities and Optimizing Products and Processes



Michael T. Todinov Oxford Brookes University, UK

This book introduces a novel method that relies on reverse engineering of algebraic inequalities with the purpose to optimize systems and processes in relevant fields like mechanical eng, structural eng, physics, electrical eng, reliability eng, and risk management. This book provides the reader with methods to enhance the reliability of systems in total absence of knowledge about the reliabilities of the components building the systems; to develop light-weight structures; to develop structures with very big load-bearing capacity; to enhance process performance; to obtain new useful physical properties and to correct flaws in the current practice for predicting system reliability.

CRC Press

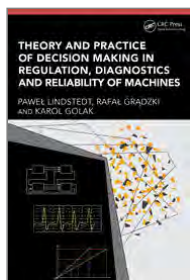
December 2024 : 214pp

Hb: 978-1-032-84856-3 : £84.99

eBook: 978-1-003-51776-4

* For full contents and more information, visit: www.routledge.com/9781032848563

Theory and Practice of Decision Making in Regulation, Diagnostics and Reliability of Machines



Paweł Lindstedt Air force institute of technology, **Rafał Grądzki** Białystok University of Technology, Poland, **Karol Golak** Białystok University of Technology, Poland

Without decision-making processes, it is difficult to achieve suitable safety and cost-efficiency. Tackling this head on, the textbook discusses theoretical foundations of decision making, and how this can impact diagnostics and the reliability of machines. Discussing cybernetics, artificial intelligence, engine control, machine diagnostics and reliability, the book uses practical examples such as turbine blades of aircraft engines and vehicles such as cars and buses. This book will be of interest to students and industry workers in the field of mechanical engineering, aerospace and automotive engineering, enabling readers to make informed decisions in their field of work.

CRC Press

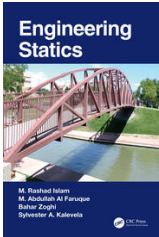
December 2024 : 232pp

Hb: 978-1-032-63841-6 : £110

eBook: 978-1-032-63844-7

* For full contents and more information, visit: www.routledge.com/9781032638416

Engineering Statics



M. Rashad Islam , M. Abdullah Al Faruque , Bahar Zoghi , Sylvester A. Kalevela

Engineering Statics presents the cutting-edge topics in engineering statics, focusing on practical applications knowledge, with numerous real-world examples, practice problems, and case studies throughout. It covers theory concisely and uses plain language and coverage that can be completed in a one-semester course. It also covers the related concepts required to take the Fundamentals of Engineering (FE) exam.

CRC Press

August 2024 : 308pp

Pb: 978-0-367-56521-3 : **£45.99**

Hb: 978-0-367-56106-2 : **£105**

eBook: 978-1-003-09815-7

* For full contents and more information, visit: www.routledge.com/9780367565213

Engineering Thermodynamics

Fundamental and Advanced Topics



Kavati Venkateswarlu RAK Research and Innovation Center, American University of Ras Al Khaimah", Ras Al Khaimah, United Arab Emirates.

The proposed textbook covers fundamental and advanced concepts of engineering thermodynamics with the help of pedagogical features including solved problems and unsolved exercises. It presents detailed discussion of vapor power cycles including reheat Rankine cycle, regenerative Rankine cycle and Carnot vapor cycle. It will be a valuable resource for senior undergraduate and graduate students in the field of mechanical engineering, civil engineering and aerospace engineering.

CRC Press

October 2024 : 487pp

Pb: 978-0-367-65210-4 : **£51.99**

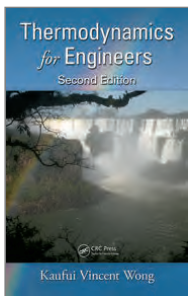
Hb: 978-0-367-64628-8 : **£135**

eBook: 978-1-003-12836-6

* For full contents and more information, visit: www.routledge.com/9780367652104

2ND EDITION

Thermodynamics for Engineers



Kaufui Vincent Wong University of Miami, Coral Gables, Florida, USA

Series: Mechanical and Aerospace Engineering Series

This second edition presents a comprehensive treatment of engineering thermodynamics from a classical point of view to prepare engineering students for professional practice. Taking an accessible, straightforward, and cohesive approach, the book exposes readers to the "big picture" of thermodynamics, and its streamlined presentation allows glimpses into important concepts and methods rarely offered by texts at this level. This edition includes a new chapter on thermodynamic property relations and every chapter has updated, expanded problem sets. The author has developed a unique, practical guide to classical thermodynamics that can be used for reference or for a one-semester course.

CRC Press

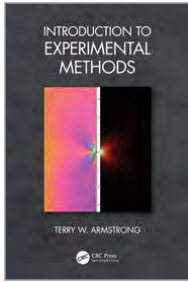
August 2011 : 450pp

Hb: 978-1-439-84559-2 : **£145**

eBook: 978-0-429-18488-8

* For full contents and more information, visit: www.routledge.com/9781439845592

Introduction to Experimental Methods



Terry W. Armstrong New Mexico State University,
United States

Introduction to Experimental Methods explains fundamental engineering concepts in mechanics, dynamics, heat transfer, and fluid dynamics. From conceptualizing an engineering experiment to presenting the results with lab experiments, this book enables students to work through the design process and analyze experimental results. The book is intended for senior undergraduate engineering students taking courses in Experimental Methods. Offering a complete overview of instruction for engineering lab methodology, the book includes practical lab manuals for student use. It discusses how to write lab reports, various instruments and equipment, as well as failures in experimentation.

CRC Press

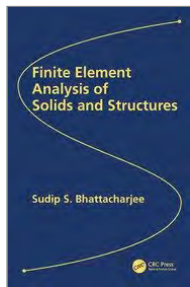
July 2023 : 488pp

Hb: 978-1-032-35893-2 : £125

eBook: 978-1-003-32923-7

* For full contents and more information, visit: www.routledge.com/9781032358932

Finite Element Analysis of Solids and Structures



Sudip S. Bhattacharjee

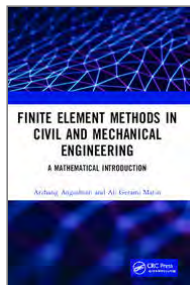
This textbook combines the theory of elasticity (advanced analytical treatment of stress analysis problems) and finite element methods (numerical details of finite element formulations) into one academic course derived from author's teaching, research, and applied work in automotive product development as well as in civil structural analysis. This work contains 12 discrete chapters that can be covered in a single semester university graduate course on linear elastic finite element analysis methods. The book also serves as a reference for practicing engineers working on design assessment and analysis of solids and structures.

CRC Press
October 2024 : 340pp
Pb: 978-1-032-04158-2 : **£45.99**
Hb: 978-0-367-43705-3 : **£110**
eBook: 978-1-003-02784-3

* For full contents and more information, visit: www.routledge.com/9781032041582

Finite Element Methods in Civil and Mechanical Engineering

A Mathematical Introduction



Arzhang Angoshtari George Washington University, USA, **Ali Gerami Matin** George Washington University, USA

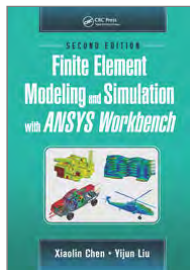
The finite element method is widely employed for numerical simulations in engineering and science due to its efficiency. This concise introduction to the mathematical theory of the finite element method presents a selection of applications in civil and mechanical engineering such as beams and frames, Poisson's equation, heat transfer, advection-diffusion, linear elasticity, and incompressible fluids. Simple MATLAB codes and/or FENICS scripts of these examples can be downloaded from the book's companion website.

CRC Press
December 2020 : 176pp
Pb: 978-1-138-33517-2 : **£45.99**
Hb: 978-1-138-33516-5 : **£96.99**
eBook: 978-0-429-44250-6

* For full contents and more information, visit: www.routledge.com/9781138335172

2ND EDITION

Finite Element Modeling and Simulation with ANSYS Workbench, Second Edition



Xiaolin Chen Washington State University, Vancouver, USA, **Yijun Liu** University of Cincinnati, Ohio, USA

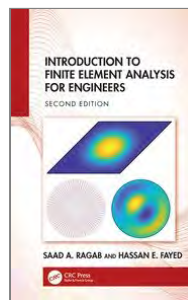
Finite Element Modeling and Simulation with ANSYS Workbench 18, Second Edition, combines finite element theory with real-world practice. Providing an introduction to finite element modeling and analysis for those with no prior experience, and written by authors with a combined experience of 30 years teaching the subject, this text presents FEM formulations integrated with relevant hands-on instructions for using ANSYS Workbench 18. Incorporating the basic theories of FEA, simulation case studies, and the use of ANSYS Workbench in the modeling of engineering problems, the book also establishes the finite element method as a powerful numerical tool in engineering design and analysis.

CRC Press
September 2018 : 472pp
Hb: 978-1-138-48629-4 : **£145**
eBook: 978-1-351-04587-2

* For full contents and more information, visit: www.routledge.com/9781138486294

2ND EDITION

Introduction to Finite Element Analysis for Engineers



Saad A. Ragab Virginia Tech, USA, **Hassan E. Fayed** Virginia Tech, USA

The book includes MATLAB codes and aims to build a comprehensive understanding of FEA and its applications in modern engineering. New chapters include topics such as a system of partial differential equations in two or more independent variables, while chapter ten presents the finite element method for a nonlinear Mindlin-Reissner plate. The book demonstrates the power and versatility of FEA as a tool, with many examples of practical engineering problems. These problems range from those which can be solved without a computer, to those requiring MATLAB or Python. With applications in Civil, Mechanical, Aerospace and Biomedical Engineering, the textbook is ideal for graduate students.

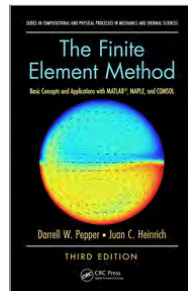
CRC Press
August 2024 : 772pp
Hb: 978-1-032-34629-8 : **£165**
eBook: 978-1-003-32315-0

* For full contents and more information, visit: www.routledge.com/9781032346298

3RD EDITION

The Finite Element Method

Basic Concepts and Applications with MATLAB, MAPLE, and COMSOL, Third Edition



Darrell W. Pepper University of Nevada, Las Vegas, USA, **Juan C. Heinrich** University of New Mexico, Albuquerque, USA

Series: Computational and Physical Processes in Mechanics and Thermal Sciences

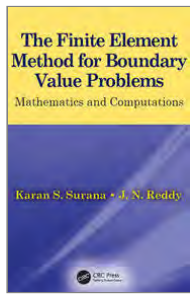
The third edition of the book introduces the fundamentals of the finite element method through simple examples and an applications-oriented approach using the latest computational tools. Using the transport equation for heat transfer as the foundation for the governing equations, text demonstrates the versatility of the method of weighted residuals for a wide range of applications including structural analysis and fluid flow. It introduces the boundary element method and meshless, or mesh-free, methods through two additional chapters. User-friendly computer codes written in MATLAB, MAPLE and FORTRAN are listed.

CRC Press
March 2017 : 628pp
Hb: 978-1-498-73860-6 : **£145**
eBook: 978-1-315-39510-4

* For full contents and more information, visit: www.routledge.com/9781498738606

The Finite Element Method for Boundary Value Problems

Mathematics and Computations



Karan S. Surana University of Kansas, USA, **J. N. Reddy**
Texas A&M University, College Station, USA

Series: Applied and Computational Mechanics

Written by two well-respected experts in the field, *The Finite Element Method for Boundary Value Problems: Mathematics and Computations* bridges the gap between applied mathematics and application-oriented studies of FEM. Mathematically rigorous, it uses examples, applications, and illustrations from various areas of engineering, applied mathematics, and the physical sciences. Readers are able to grasp the mathematical foundations of FEM, as well as its versatility; unlike many finite element texts this work is not limited to solid mechanics problems. Based around use of the finite element method for solving boundary value problems (BVPs), the text is organized around three categories of differential operators: self-adjoint, non-self adjoint, and non-linear. These operators are utilized with various methods of approximation, including the Galerkin, Petrov-Galerkin, and other methods.

CRC Press

November 2016 : 824pp

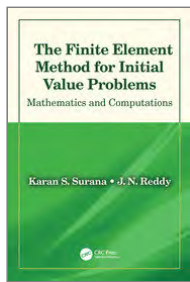
Hb: 978-1-498-78050-6 : £190

eBook: 978-1-315-36571-8

* For full contents and more information, visit: www.routledge.com/9781498780506

The Finite Element Method for Initial Value Problems

Mathematics and Computations



Karan S. Surana University of Kansas, USA, **J. N. Reddy**
Texas A&M University, College Station, USA

Unlike most finite element books that cover time dependent processes (IVPs) in a cursory manner, *The Finite Element Method for Initial Value Problems: Mathematics and Computations* focuses on the mathematical details as well as applications of space-time coupled and space-time decoupled finite element methods for IVPs. Space-time operator classification, space-time methods of approximation, and space-time calculus of variations are used to establish unconditional stability of space-time methods during the evolution. Space-time decoupled methods are also presented with the same rigor.

CRC Press

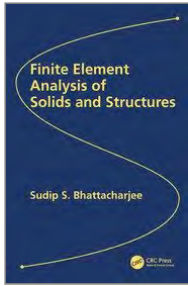
October 2017 : 630pp

Hb: 978-1-138-57637-7 : £195

eBook: 978-1-351-27000-7

* For full contents and more information, visit: www.routledge.com/9781138576377

Finite Element Analysis of Solids and Structures



Sudip S. Bhattacharjee

This textbook combines the theory of elasticity (advanced analytical treatment of stress analysis problems) and finite element methods (numerical details of finite element formulations) into one academic course derived from author's teaching, research, and applied work in automotive product development as well as in civil structural analysis. This work contains 12 discrete chapters that can be covered in a single semester university graduate course on linear elastic finite element analysis methods. The book also serves as a reference for practicing engineers working on design assessment and analysis of solids and structures.

CRC Press

October 2024 : 340pp

Pb: 978-1-032-04158-2 : **£45.99**

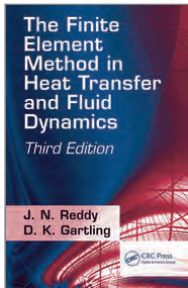
Hb: 978-0-367-43705-3 : **£110**

eBook: 978-1-003-02784-3

* For full contents and more information, visit: www.routledge.com/9781032041582

3RD EDITION

The Finite Element Method in Heat Transfer and Fluid Dynamics



J. N. Reddy Texas A&M University, College Station, USA,
D.K. Gartling Sandia National Laboratories, Albuquerque,
New Mexico, USA

Series: Applied and Computational Mechanics

Considered to be among the very best in the field, this masterwork from renowned experts J. N. Reddy and David Gartling is the latest version of a book that has long been relied upon by practicing engineers, researchers, and graduate students. Noted for its powerful methodology and clear explanations of the subject, this third edition contains considerably more workable exercises and examples associated with problems in heat conduction, incompressible viscous flow, and convection heat transfer. It also uses applied examples to show realistic examples of FEM in thermal and fluid design analysis.

CRC Press

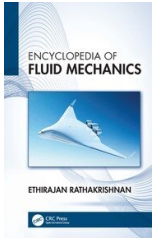
April 2010 : 524pp

Hb: 978-1-420-08598-3 : **£195**

eBook: 978-0-429-11142-6

* For full contents and more information, visit: www.routledge.com/9781420085983

Encyclopedia of Fluid Mechanics



Ethirajan Rathakrishnan Indian Institute of Technology Kanpur, India

This book, being developed using the course material used in teaching the courses on the fluid mechanics, high-speed flows, aerodynamics, high-enthalpy flows, experimental methods, aircraft design, heat transfer, introduction to engineering, wind engineering, precisely presents the theoretical and application aspects of the terms associated with those. It will serve as ideal study material for senior undergraduate and graduate students in the fields of mechanical engineering, aerospace engineering, flow physics, civil engineering, automotive engineering, and manufacturing engineering.

CRC Press

December 2022 : 570pp

Pb: 978-1-032-38238-8 : **£91.99**

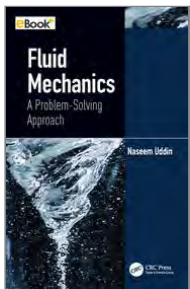
Hb: 978-1-032-39101-4 : **£240**

eBook: 978-1-003-34840-5

* For full contents and more information, visit: www.routledge.com/9781032382388

Fluid Mechanics

A Problem-Solving Approach



Naseem Uddin Universiti Teknologi Brunei

Fluid Mechanics: A Problem-Solving Approach presents problem-solving approaches that are used in fluid mechanics and provides a clear distinction between integral formulation and the different formulation of conservation law. The book is intended for senior undergraduate mechanical and civil engineering students taking courses in Fluid Mechanics. Including a detailed discussion on pipe flow correlations, entrance length correlations, and plotting of Moody diagram, the book works through the comprehensive coverage of fluid mechanics with a gradual introduction of theory in a straightforward, practical approach.

CRC Press

December 2022 : 537pp

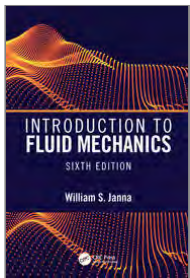
Hb: 978-1-032-32453-1 : **£105**

eBook: 978-1-032-32456-2 : **£105**

* For full contents and more information, visit: www.routledge.com/9781032324531

6TH EDITION

Introduction to Fluid Mechanics, Sixth Edition



William S. Janna University of Memphis, Tennessee, USA

Introduction to Fluid Mechanics, Sixth Edition, is intended for a first course in Fluid Mechanics, as taken by a range of engineering majors. Beginning with dimensions, units, and fluid properties, the text continues with explanation of key equations and coverage of the control-volume approach.

CRC Press

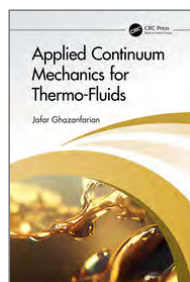
April 2020 : 754pp

Hb: 978-0-367-34127-5 : **£165**

eBook: 978-0-429-32453-6

* For full contents and more information, visit: www.routledge.com/9780367341275

Applied Continuum Mechanics for Thermo-Fluids



Jafar Ghazanfarian University of Zanjan, Iran

Applied Continuum Mechanics for Thermo-Fluids presents the tensor notation rules and integral theorems before defining the preliminary concepts and applications of continuum mechanics. It bridges the gap between physical concepts and mathematical expressions with a rigorous mathematical treatment. The book is intended for upper-level undergraduate mechanical engineering students taking Continuum Mechanics, Advanced Fluid Mechanics, and Convective Heat Transfer courses. Instructors will be able to utilize a Solutions Manual and Figure Slides for their course.

CRC Press

June 2024 : 245pp

Hb: 978-1-032-71938-2 : **£99.99**

eBook: 978-1-032-72484-3 : **£91.99**

* For full contents and more information, visit: www.routledge.com/9781032719382

2ND EDITION

Fluid Mechanics

An Intermediate Approach



Bijay K. Sutanian University of Central Florida, FL

Fluid Mechanics: An Intermediate Approach helps readers develop a physics-based understanding of complex flows and mathematically model them with accurate boundary conditions for numerical predictions. The book includes numerous worked examples and end-of-chapter problems for student practice. It also discusses how to numerically model compressible flow over all Mach numbers in a variable-area duct, accounting for friction, heat transfer, rotation, internal choking, and normal shock formation. The book is intended for graduate mechanical and aerospace engineering students taking courses in Fluid Mechanics and Gas Dynamics.

CRC Press

January 2025 : 390pp

Hb: 978-1-032-35079-0 : **£110**

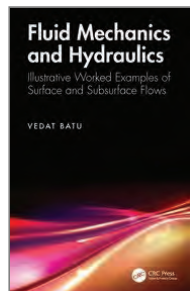
eBook: 978-1-003-32519-2

eBook: 978-1-003-32519-2

* For full contents and more information, visit: www.routledge.com/9781032350790

Fluid Mechanics and Hydraulics

Illustrative Worked Examples of Surface and Subsurface Flows



Vedat Batu

Fluid Mechanics and Hydraulics: Illustrative Worked Examples of Surface and Subsurface Flows presents the basic principles of fluid mechanics through the use of numerous worked examples. It serves as an effective learning source for college students and as a teaching tool for instructors (with an included solutions manual) as well as for practicing professionals in the areas of fluid mechanics and hydraulics.

CRC Press

May 2024 : 1268pp

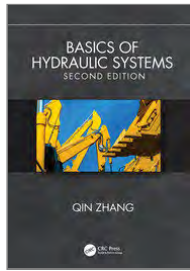
Hb: 978-1-032-60078-9 : **£165**

eBook: 978-1-003-45744-2

* For full contents and more information, visit: www.routledge.com/9781032600789

2ND EDITION

Basics of Hydraulic Systems, Second Edition



Qin Zhang Washington State University, Prosser, USA

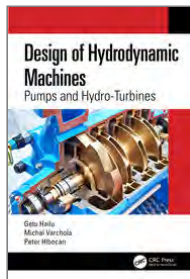
Basics of Hydraulic Systems, Second Edition provides students and professionals in both engineering and technology management fields a basic book to assist in their study of fluid power systems technology. This edition is expanded to include new chapters on system modeling and hydraulic systems controls. The text covers subjects essential to understanding operating principles, configuration features, functionalities, applications of composing elements, and controls of hydraulic systems. It presents them in a systematic, accessible way, following the course of energy transmission in hydraulic power generation, distribution, deployment, modeling, and control in fluid power systems.

CRC Press
March 2019 : 338pp
Hb: 978-1-138-48466-5 : £145
eBook: 978-0-429-19726-0

* For full contents and more information, visit: www.routledge.com/9781138484665

Design of Hydrodynamic Machines

Pumps and Hydro-Turbines



Getu Hailu University of Alaska Anchorage, USA, **Michal Varchola** Slovak Technical University, Slovakia, **Peter Hibocan**

Design of Hydrodynamic Machines provides a broad, yet concise, theoretical background on the relationship between fluid dynamics and geometry. It covers the most important types of turbomachinery used in power generation industrial processes, utilities, and the oil and gas industry. Intended for final year undergraduates and postgraduates in mechanical, civil, and aeronautical engineering, the book will also be useful for those involved in the hydraulic design, analysis, and testing of turbomachinery. The book offers guidance on the hydraulic design aspect of different parts of turbomachinery, such as impellers, diffusers, volute casing, inlet and outlets.

CRC Press
May 2022 : 268pp
Hb: 978-0-367-43961-3 : £120
eBook: 978-1-003-00714-2

* For full contents and more information, visit: www.routledge.com/9780367439613

2ND EDITION

Engineering Applications of Pneumatics and Hydraulics



Ian C. Turner Chartered Consulting Engineer, UK

Requiring only a very basic knowledge of the physics of fluids, this book provides a sound understanding of fluid power systems and their uses. It takes a strongly practical approach and covers maintenance and trouble-shooting, with a particular emphasis on safety systems and regulations. This second edition completely updates the guidance on safety legislation, codes of practice, technical standards and standardisation organisations, reflecting advances in technology. It is written for students from Levels 3 to 5, and for a wide range of practising engineers: especially plant, operations, and measurement and control engineers.

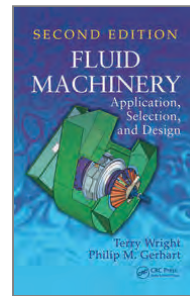
Routledge
August 2020 : 184pp
Pb: 978-0-367-46084-6 : £45.99
Hb: 978-0-367-46085-3 : £81.99
eBook: 978-1-003-02681-5

* For full contents and more information, visit: www.routledge.com/9780367460846

2ND EDITION

Fluid Machinery

Application, Selection, and Design, Second Edition



Terry Wright Consultant, Cornelia, Georgia, USA, **Philip Gerhart** University of Evansville, Indiana, USA

The second edition of a classic, this work provides a comprehensive introduction to the fluid mechanics of turbomachinery. By focusing on the preliminary design and selection of equipment to meet performance specifications, the authors promote a basic yet thorough understanding of the subject. Topics covered include gas and hydraulic turbines as well as industrial equipment, such as pumps and fans, making the text ideal for undergraduate mechanical engineering students. This book presents illustrations, examples, and exercises that emphasize real-world industrial applications of fluid machinery.

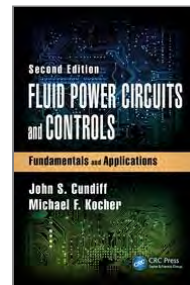
CRC Press
December 2009 : 454pp
Hb: 978-1-420-08294-4 : £140
eBook: 978-0-429-14121-8

* For full contents and more information, visit: www.routledge.com/9781420082944

2ND EDITION

Fluid Power Circuits and Controls

Fundamentals and Applications, Second Edition



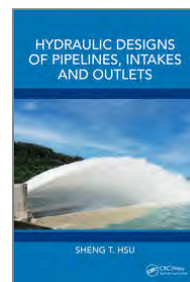
John S. Cundiff Virginia Tech University, Blacksburg, USA, **Michael F. Kocher** University of Nebraska, Lincoln, USA

Fluid Power Circuits and Controls: Fundamentals and Applications, Second Edition, is designed for a first course in fluid power for undergraduate engineering students. After an introduction to the design and function of components, students apply what they've learned, and consider how the component operating characteristics interact with the rest of the circuit. The Second Edition offers many new worked examples, and additional exercises and problems in each chapter. Half of these new problems involve basic analysis of specific elements, and the rest are design-oriented, emphasizing analysis of system performance. A complete Solutions Manual is available for qualified adopting instructors.

CRC Press
December 2019 : 554pp
Hb: 978-1-498-77001-9 : £120
eBook: 978-0-429-18370-6

* For full contents and more information, visit: www.routledge.com/9781498770019

Hydraulic Designs of Pipelines, Intakes and Outlets



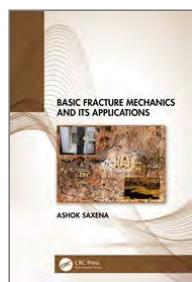
Sheng T. Hsu GT International, Taipei, Taiwan

This book addresses hydraulic design considerations of integrated pipeline systems, including intakes, conduits, and outlets. Based on the author's experience of over 50 years working with hydraulic designs of structures as well as designs, analyses and trouble-shootings of pipeline systems, the book discusses actual design practice and presents a range of real-world examples of projects conducted and participated in by the author. This applied approach gives the book a uniquely practical focus. The book serves as a reference for practitioners as well as a textbook for postgraduate students.

CRC Press
February 2025 : 364pp
Hb: 978-1-032-60651-4 : £140
eBook: 978-1-003-46267-5

* For full contents and more information, visit: www.routledge.com/9781032606514

Basic Fracture Mechanics and its Applications



Ashok Saxena WireTough Cylinders, USA

Beginning with four foundational chapters, discussing the theory in depth, the book also presents specific aspects of fracture mechanics and fatigue. Other topics include material testing and selection for damage tolerant design, alongside a discussion of ensuring the structural integrity of components. Alongside a strong focus on the practical applications of fracture mechanics and fatigue, the book will also provide a clear working of the theory and includes appendices with additional background to ensure a comprehensive understanding. Every chapter ends with both solved and unsolved example problems and end of chapter problems, and instructor support materials are also available.

CRC Press

December 2022 : 342pp

Hb: 978-1-032-26719-7 : **£76.99**

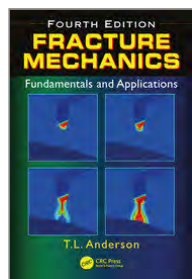
eBook: 978-1-003-29229-6

* For full contents and more information, visit: www.routledge.com/9781032267197

4TH EDITION

Fracture Mechanics

Fundamentals and Applications, Fourth Edition



Ted L. Anderson Quest Integrity Group, Boulder USA

Fracture Mechanics: Fundamentals and Applications, Fourth Edition is the most useful and comprehensive guide to fracture mechanics available. It has been adopted by more than 150 universities worldwide and used by thousands of engineers and researchers. This new edition reflects the latest research, industry practices, applications, and computational analysis and modeling. It encompasses theory and applications, linear and nonlinear fracture mechanics, solid mechanics, and materials science with a unified, balanced, and in-depth approach. Numerous chapter problems have been added or revised, and additional resources are available for those teaching college courses or training sessions.

CRC Press

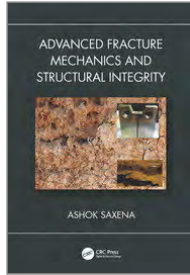
February 2017 : 684pp

Hb: 978-1-498-72813-3 : **£145**

eBook: 978-1-315-37029-3

* For full contents and more information, visit: www.routledge.com/9781498728133

Advanced Fracture Mechanics and Structural Integrity



Ashok Saxena University of Arkansas, Fayetteville, USA

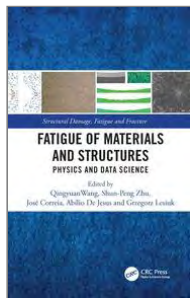
Advanced Fracture Mechanics and Structural Integrity is organized to cover quantitative descriptions of crack growth and fracture phenomena. The mechanics of fracture are explained, emphasizing elastic-plastic and time-dependent fracture mechanics. Applications are presented, using examples from power generation, aerospace, marine, and chemical industries, with focus on predicting the remaining life of structural components and advanced testing methods for structural materials. Numerous examples and end-of-chapter problems are provided, along with references to encourage further study. The book is written for use in an advanced graduate course on fracture mechanics or structural integrity.

CRC Press
February 2019 : 323pp
Hb: 978-1-138-54426-0 : £145
eBook: 978-1-351-00406-0

* For full contents and more information, visit: www.routledge.com/9781138544260

Fatigue of Materials and Structures

Physics and Data Science



Edited by **Qingyuan Wang** Sichuan University, China, **Shun-Peng Zhu** University of Electronic Science and Technology of China, China, **José Correia** University of Porto, Portugal, **Abílio De Jesus** University of Porto, Portugal, **Grzegorz Lesiuk** Wroclaw University of Science and Technology, Poland

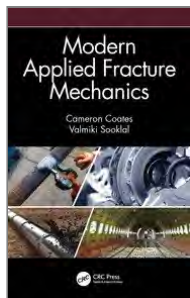
Series: Structural Damage, Fatigue and Fracture

Failure mechanisms and modeling in engineering materials and structures are critical for managing aging structures, and directly affect their sustainability. Key theories and methods of fatigue failure are discussed in detail. Fatigue damage accumulation, crack initiation and crack growth analysis are presented with a focus on mechanical understanding and risk management for design, maintenance, and operation. Some recent advancements are included, such as fatigue of additive manufactured metals and advanced materials, with data analytics and AI, which could potentially transform fatigue analysis and reliability design.

CRC Press
May 2025 : 510pp
Hb: 978-1-032-49755-6 : £165

* For full contents and more information, visit: www.routledge.com/9781032497556

Modern Applied Fracture Mechanics



Cameron Coates Kennesaw State University, USA,
Valmiki Sooklal Kennesaw State University, USA

Modern Applied Fracture Mechanics presents a practical, accessible guide to understanding and applying basic linear elastic fracture mechanics (LEFM) techniques to problems commonly seen in industry, including fatigue analysis, failure analysis, and damage tolerance. The textbook is appropriate for undergraduate students, preparing them for the industry, and for advanced studies in fracture mechanics at the graduate level. Industry professionals and researchers will find this book a valuable resource for understanding basic fracture mechanics principles and methods.

CRC Press
August 2022 : 242pp
Hb: 978-0-367-50125-9 : £110
eBook: 978-1-003-05205-0

* For full contents and more information, visit: www.routledge.com/9780367501259

4TH EDITION

Heat Exchangers

Selection, Rating, and Thermal Design, Fourth Edition



Sadik Kakaç TOBB University of Economics and Technology, Ankara, Turkey, **Hongtan Liu** University of Miami, Coral Gables, Florida, USA, **Anchasa Pramuanjaroenkij** Kasetsart University, Chalemphrakiat Sakon Nakhon Province Campus, Thailand

Heat exchangers are essential in a wide range of engineering applications, including power plants, automobiles, airplanes, process and chemical industries, and heating, air conditioning and refrigeration systems. Revised and updated with new problem sets, the fourth edition presents a fully updated and systematic treatment of heat exchangers, focusing on selection, thermal-hydraulic design, and rating. The fourth edition is designed for student readers taking courses/modules in process heat transfer, thermal systems design, and heat exchanger technology, this text includes full coverage of all widely-used heat exchanger types.

CRC Press

February 2020 : 546pp

Hb: 978-1-138-60186-4 : £120

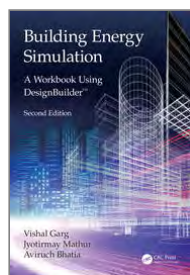
eBook: 978-0-429-46986-2

* For full contents and more information, visit: www.routledge.com/9781138601864

2ND EDITION

Building Energy Simulation

A Workbook Using DesignBuilder™



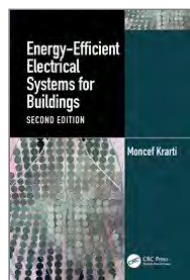
Vishal Garg IIIT, Hyderabad, Telangana, India, **Jyotirmay Mathur** MNIT, Jaipur, Rajasthan, India, **Aviruch Bhatia** IIIT, Hyderabad, Telangana, India

The 2nd edition of Building Energy Simulation includes study of various components and systems of a building and their effect on energy consumption, with the help of DesignBuilder™, a front-end for EnergyPlus simulation engine, supported by examples and exercises. Following a "learning by doing" methodology, it explains simulation input parameters and how to do analysis of the simulation output explaining building physics and energy simulation. Divided into three sections, it covers fundamentals of energy simulation followed by advanced topics in energy simulation and simulation for compliance of building codes and detailed case studies for whole building energy simulation.

CRC Press
September 2020 : 740pp
Pb: 978-0-367-37468-6 : £110
Hb: 978-0-367-37470-9 : £280
eBook: 978-0-429-35463-2

* For full contents and more information, visit: www.routledge.com/9780367374686

2ND EDITION

Energy-Efficient Electrical Systems for Buildings

Moncef Krarti University of Colorado, United States

Series: Mechanical and Aerospace Engineering Series

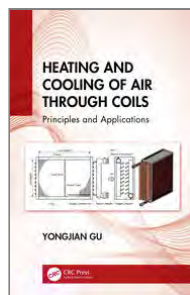
Energy-Efficient Electrical Systems for Buildings, Second Edition offers systematic and practical approaches to design and analyze electrical distribution and utilization systems in buildings. It considers safety and energy efficiency, focusing on sustainability and resiliency, to design electrical distribution systems for buildings. The book is intended for senior undergraduate mechanical, civil, and electrical engineering students taking courses in Electrical Systems for Buildings and Design of Building Electrical Systems. It features a new chapter on the optimal design energy efficient and resilient power systems and new chapter problems, examples, and case studies.

CRC Press
August 2023 : 580pp
Hb: 978-1-032-23383-3 : £125
eBook: 978-1-032-23403-8 : £115

* For full contents and more information, visit: www.routledge.com/9781032233833

Heating and Cooling of Air Through Coils

Principles and Applications



Yongjian Gu United States Merchant Marine Academy, New York

Heating and Cooling of Air Through Coils combines theory and practice to cover the fundamentals in the processes of heating and cooling of air through coils and the key aspects in coil fluid piping systems, coils, and energy sources for the fluid in the coils. The book will interest engineers and researchers involved in the design and operation of heat exchangers and HVAC systems. It can also serve as a textbook for undergraduate students taking courses in Advanced Heat Transfer, HVAC, and Energy Management. The book covers various coil types, coil tube constructions and arrangements, and fluid flow characteristics in the coils.

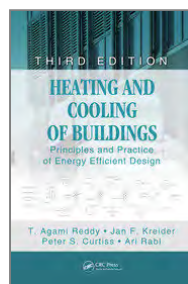
CRC Press
September 2023 : 288pp
Hb: 978-1-032-26663-3 : £115
eBook: 978-1-003-28932-6

* For full contents and more information, visit: www.routledge.com/9781032266633

3RD EDITION

Heating and Cooling of Buildings

Principles and Practice of Energy Efficient Design, Third Edition



T. Reddy Arizona State University, USA, **Jan F. Kreider**, **Peter S. Curtiss** Curtiss Engineering, Inc., Boulder, Colorado, USA, **Ari Rabi** École des Mines, Paris, France

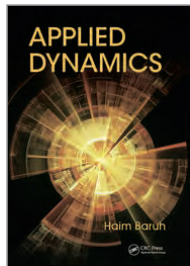
Series: Mechanical and Aerospace Engineering Series

Structured to provide a rigorous and comprehensive introduction to the design of mechanical systems in buildings, the new revision of this successful text provides up to date coverage based around the latest advances in energy efficiency and green design. Along with numerous new and revised examples, design case studies, and homework problems, the third edition offers an updated version of the HCB software and website, which contains a wealth of data to support design analysis and planning. Based around current codes and standards, this third edition explores the latest technologies that are central to design and operation of today's buildings.

CRC Press
July 2016 : 900pp
Hb: 978-1-439-89989-2 : £185
eBook: 978-1-315-37456-7

* For full contents and more information, visit: www.routledge.com/9781439899892

Applied Dynamics



Haim Baruh Rutgers University, Piscataway, New Jersey, USA

This modern study of engineering dynamics covers an array of topics, from basic principles to two- and three-dimensional motion, general kinematics and kinetics, analytical mechanics, vehicle motion, vibration response, and stability. By including examples from everyday life, the book makes concepts relatable and accessible. However, no effort is made to reduce rigor, as the text provides thorough coverage of the fundamental concepts of Newtonian and Lagrangian mechanics, three-dimensional motion, Kane's equations, as well as the stability and response of dynamical systems.

CRC Press

December 2014 : 876pp

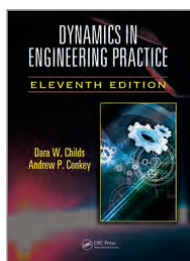
Hb: 978-1-482-25073-2 : £155

eBook: 978-0-429-09044-8

* For full contents and more information, visit: www.routledge.com/9781482250732

11TH EDITION

Dynamics in Engineering Practice



Dara W. Childs Texas A&M University, College Station, USA, **Andrew P. Conkey** Texas A&M University, Corpus Christi, USA

Series: Applied and Computational Mechanics

Written by a renowned teacher, researcher, and professional consultant in applied dynamics, this book represents a revolutionary approach to modern engineering dynamics analysis—one you can assimilate quickly and easily to get immediate results. The eleventh edition includes a new chapter on Lagrangian Dynamics, and many new and revised examples and chapter problems. The book begins by establishing the premise that most dynamics engineers are developing and analyzing models to predict motion, and that the subject of differential equations is the natural language for dynamics.

CRC Press

April 2015 : 474pp

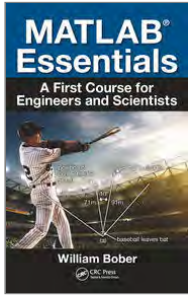
Hb: 978-1-482-25025-1 : £145

eBook: 978-0-429-16210-7

* For full contents and more information, visit: www.routledge.com/9781482250251

MATLAB® Essentials

A First Course for Engineers and Scientists



William Bober Florida Atlantic University, Boca Raton, USA

All disciplines of science and engineering use numerical methods for complex problem analysis, due to the highly mathematical nature of the field. Analytical methods alone are unable to solve many complex problems engineering students and professionals confront. Introduction to MATLAB® Programming for Engineers and Scientists examines the basic elements of code writing, and describes MATLAB® methods for solving common engineering problems and applications across the range of engineering disciplines. The text uses a class-tested learning approach and accessible two-color page design to guide students from basic programming to the skills needed for future coursework and engineering practice.

CRC Press

September 2017 : 275pp

Pb: 978-1-138-03237-8 : £135

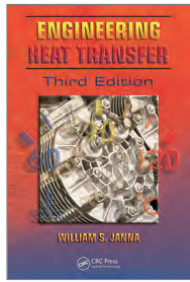
Hb: 978-1-138-56328-5 : £150

eBook: 978-1-315-16200-3

* For full contents and more information, visit: www.routledge.com/9781138032378

3RD EDITION

Engineering Heat Transfer



William S. Janna The University of Memphis, Tennessee, USA

Series: Heat Transfer

Adhering to the pedagogy that made previous editions into perennial bestsellers, this updated classic offers a student-savvy presentation of an otherwise abstract topic. Drawings and graphs are provided in abundance, as are examples and problems. The examples amplify theory and show how derived equations are used to model physical problems. This text covers practical applications in a way that deemphasizes mathematical techniques, but preserves physical interpretation of heat transfer fundamentals and modeling of heat transfer phenomena. End-of-chapter problems proceed from short simple confidence builders to difficult ones that help students develop a rigorous approach to problem solving.

CRC Press

January 2009 : 692pp

Hb: 978-1-420-07202-0 : £175

eBook: 978-1-315-27538-3

* For full contents and more information, visit: www.routledge.com/9781420072020

2ND EDITION

Introduction to Materials Science and Engineering



Yip-Wah Chung Northwestern University, Evanston, Illinois, USA, **Monica Kapoor**

Updated to reflect the many societal and technological changes in the field since publication of the first edition, Introduction to Materials Science and Engineering, Second Edition offers an interdisciplinary view, emphasizing the importance of materials to engineering applications, and builds the basis needed to select, modify, and create materials to meet specific criteria. Written for advanced undergraduate students and readers interested in introductory materials science and engineering concepts, this concise textbook provides a strong foundation in MSE and its applications. The textbook offers a solutions manual and PowerPoint lecture slides for adopting professors.

CRC Press

April 2022 : 386pp

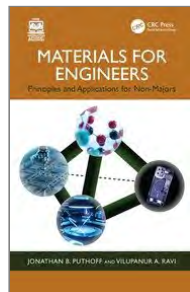
Hb: 978-1-032-10144-6 : £84.99

eBook: 978-1-003-22344-3 : £84.99

* For full contents and more information, visit: www.routledge.com/9781032101446

Materials for Engineers

Principles and Applications for Non-Majors



Jonathan B. Puthoff, **Vilupanur A. Ravi**

Designed with the needs of non-Materials Science and Engineering students in mind, this textbook covers the major categories of materials and their defining properties, but with an emphasis on applications related to materials properties measurement, materials selection, and design as opposed to an accent on fundamental physical and chemical topics. This textbook is aimed at undergraduate engineering students taking materials science courses. It can also be used by professional engineers interested in a ready reference.

CRC Press

August 2024 : 366pp

Hb: 978-1-032-10253-5 : £91.99

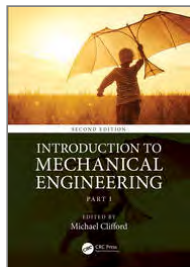
eBook: 978-1-003-21440-3

* For full contents and more information, visit: www.routledge.com/9781032102535

2ND EDITION

Introduction to Mechanical Engineering

Part 1



Edited by **Michael Clifford** University of Nottingham, UK

An Introduction to Mechanical Engineering: Part 1, Second Edition, provides a grounding in the core subjects of solid mechanics, materials, fluid mechanics, thermodynamics, electronics, and machine design. Printed in color, this updated bestseller has a full range of learning features, and online resources available for both students and instructors.

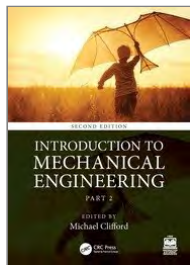
CRC Press
December 2022 : 732pp
Pb: 978-0-367-33316-4 : **£56.99**
Hb: 978-1-032-36232-8 : **£91.99**
eBook: 978-0-429-31916-7

* For full contents and more information, visit: www.routledge.com/9780367333164

2ND EDITION

Introduction to Mechanical Engineering

Part 2



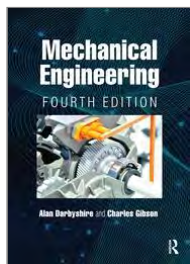
Edited by **Michael Clifford** University of Nottingham, UK

An Introduction to Mechanical Engineering Part 2, Second Edition is an essential text for all second-year undergraduate students and those studying for foundation degrees and HNDs. Building upon the first-year level topics in Introduction to Mechanical Engineering Part 1, Part 2 provides the next level of coverage for those subject areas.

CRC Press
November 2024 : 631pp
Pb: 978-0-367-33377-5 : **£56.99**
Hb: 978-1-032-76021-6 : **£91.99**
eBook: 978-0-429-31949-5

* For full contents and more information, visit: www.routledge.com/9780367333775

4TH EDITION

Mechanical Engineering

Alan Darbyshire College Lecturer, UK, **Charles Gibson** Yeovil College, UK

This established textbook is revised in line with the technical qualifications of new engineering apprenticeship standards at Level 3. Four new chapters cover dynamic engineering systems, fluid systems and additive manufacturing. Mathematical theory is backed up with numerous worked examples and student activities, with quizzes throughout the text and end-of-unit questions for revision and course work. It covers eight units of the BTEC L3 Advanced Manufacturing Engineering Development Technical Knowledge qualification, as well as content in the BTEC National Engineering Syllabus and BTEC L3 Aerospace and Aviation Engineering specialist qualifications.

Routledge
July 2022 : 518pp
Pb: 978-1-032-18853-9 : **£45.99**
Hb: 978-1-032-18854-6 : **£84.99**
eBook: 978-1-003-25657-1

* For full contents and more information, visit: www.routledge.com/9781032188539

4TH EDITION

Mechanical Engineering Principles

John Bird, **Carl Ross** Professor of Structural Dynamics, University of Portsmouth, UK

A student-friendly introduction to core mechanical engineering topics, focusing on examples and applications. The book contains 400 fully worked problems, 700 further problems with answers, and 300 multiple-choice questions. Two new chapters are included, covering the basic principles of matrix algebra and the matrix displacement method. The latter will also include guidance on software that can be used via SmartPhones, iPads or laptops. The new edition is up to date with the latest BTEC National specifications and can also be used on undergraduate courses in mechanical, civil, structural, aeronautical and marine engineering, and naval architecture.

Routledge
September 2019 : 388pp
Pb: 978-0-367-25324-0 : **£43.99**
Hb: 978-0-367-25326-4 : **£175**
eBook: 978-0-429-28720-6

* For full contents and more information, visit: www.routledge.com/9780367253240

T Level Engineering

Technology, Manufacture and Maintenance



Andrew Livesey

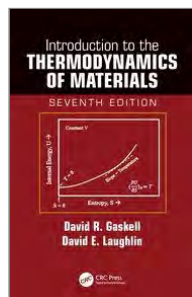
This text covers the core content for the new T Level qualifications, as well as most other Level 3 qualifications in engineering manufacturing and maintenance. It starts with the design process, progresses through the science and mathematics of engineering processes, and lastly examines the management of engineering organisations. It is ideal for students and instructors on T Level courses, as well as a handy reference book for the practising engineer.

Routledge
May 2023 : 260pp
Pb: 978-1-032-25750-1 : **£36.99**
Hb: 978-1-032-25751-8 : **£84.99**
eBook: 978-1-003-28483-3

* For full contents and more information, visit: www.routledge.com/9781032257501

7TH EDITION

Introduction to the Thermodynamics of Materials



David R. Gaskell, **David E. Laughlin** Carnegie Mellon University, Pittsburgh, Pennsylvania, USA

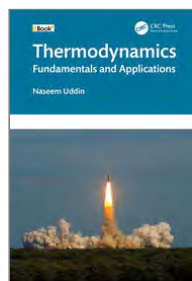
Maintaining the substance that has made Introduction to the Thermodynamic of Materials a perennial best seller for decades, this Seventh Edition is updated to reflect the broadening field of materials science and engineering. Chapters are updated and revised throughout to be more useful and logical for students. Written as the definitive introduction to thermodynamic behavior of materials systems, this text presents the underlying thermodynamic principles of materials and their applications and continues to be the best undergraduate textbook in thermodynamics for materials science students. An updated solutions manual is also available for qualifying adopting professors.

CRC Press
July 2024 : 696pp
Hb: 978-1-032-45099-5 : £120
eBook: 978-1-003-37538-8

* For full contents and more information, visit: www.routledge.com/9781032450995

Thermodynamics

Fundamentals and Applications



Naseem Uddin Universiti Teknologi Brunei

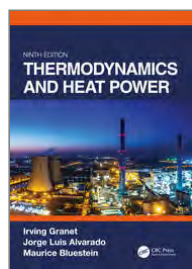
Thermodynamics: Fundamentals and Applications offers a blend of theory and practical applications for a complete understanding of thermodynamics for various engineering applications. Beginning with a basic introduction and principles of thermodynamics, the book advances to more specialized topics like Organic Rankine cycle, gas mixtures, equilibria, and chemical reactions. The book is intended for senior undergraduate mechanical, aerospace, and chemical engineering students taking courses in Thermodynamics.

CRC Press
July 2024 : 537pp
Hb: 978-1-032-72938-1 : £130
eBook: 978-1-032-72940-4 : £125

* For full contents and more information, visit: www.routledge.com/9781032729381

9TH EDITION

Thermodynamics and Heat Power, Ninth Edition



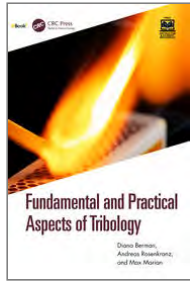
Irving Granet Texas A&M University(TAMU), USA, **Jorge Alvarado** Texas A&M University, USA, **Maurice Bluestein** Indiana University–Purdue University Indianapolis, USA

The ninth edition of Thermodynamics and Heat Power offers a revised sequence of thermodynamics concepts, processes, and energy systems to enable learning outcomes for Engineering and Engineering Technology students taking an introductory course. Built around an easily understandable approach, this updated text focuses on thermodynamics fundamentals and explores renewable energy generation, IC engines, power plants, HVAC, and applied heat transfer. Energy, heat, and work are examined in relation to thermodynamics cycles, and the effects of fluid properties on system performance are explained. Numerous step-by-step examples and problems make this text ideal for student readers.

CRC Press
September 2023 : 864pp
Pb: 978-0-367-56184-0 : £59.99
Hb: 978-0-367-28091-8 : £145
eBook: 978-0-429-29962-9

* For full contents and more information, visit: www.routledge.com/9780367561840

Fundamental and Practical Aspects of Tribology



Diana Berman , Andreas Rosenkranz , Max Marian

Fundamental and Practical Aspects of Tribology introduces the rudiments of engineering surfaces and teaches basic phenomena of interacting surfaces in relative motion, major modes of friction and wear, and theories of contact evolution and lubrication. The book also considers the relationship between nanotribology and macrotribology, rolling contacts, tribological problems in magnetic recording and electrical contacts, and monitoring and diagnosis of friction and wear. This textbook is written for students taking courses in tribology and lubrication, as well as surface engineering. It will also appeal to scientists and engineers who are new to tribology.

CRC Press

July 2024 : 314pp

Hb: 978-1-032-50225-0 : **£92.99**

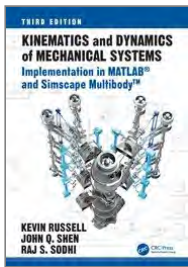
eBook: 978-1-032-80355-5 : **£86.99**

* For full contents and more information, visit: www.routledge.com/9781032502250

3RD EDITION

Kinematics and Dynamics of Mechanical Systems

Implementation in MATLAB® and Simscape Multibody™



Kevin Russell New Jersey Institute of Technology, USA,
John Q. Shen Softalink LLC, USA, **Raj S. Sodhi** New Jersey Institute of Technology, USA

Updated throughout for the third edition, Kinematics and Dynamics of Mechanical Systems: Implementation in MATLAB™ and Simscape Multibody™ offers step-by-step instruction on the fundamentals of mechanism kinematics, synthesis, statics and dynamics, alongside demonstrating its real-world applications. Following updates made by MATLAB™, replacing Simmechanics with new system Simscape Multibody, this textbook provides updated instructions and example problems to fully enable the reader to use this new and improved system. New features includes enhanced rendering, 3D geometry in animations of user-generated solutions for planar linkages, spatial linkages and robotic systems.

CRC Press

December 2022 : 544pp

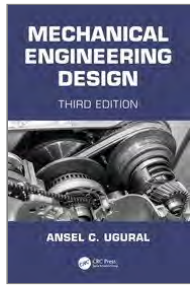
Hb: 978-1-032-32831-7 : £145

eBook: 978-1-003-31696-1

* For full contents and more information, visit: www.routledge.com/9781032328317

3RD EDITION

Mechanical Engineering Design



Ansel C. Ugural New Jersey Institute of Technology,
Newark, USA

Mechanical Engineering Design, Third Edition strikes a balance between theory and application, and prepares students for more advanced study or professional practice. Updated throughout, it outlines basic concepts and provides the necessary theory to gain insight into mechanics with numerical methods in design. Divided into three sections, the text presents background topics, addresses failure prevention across a variety of machine elements, and covers the design of machine components as well as entire machines. Optional sections treating special and advanced topics are also included.

CRC Press
December 2020 : 852pp
Hb: 978-0-367-51347-4 : £115
eBook: 978-1-003-09928-4

* For full contents and more information, visit: www.routledge.com/9780367513474

3RD EDITION

Mechanical Engineering Design (SI Edition)



Ansel C. Ugural New Jersey Institute of Technology,
Newark, USA

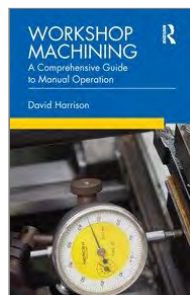
Mechanical Engineering Design, Third Edition strikes a balance between theory and application, and prepares students for more advanced study or professional practice. Updated throughout, it outlines basic concepts and provides the necessary theory to gain insight into mechanics with numerical methods in design. Divided into three sections, the text presents background topics, addresses failure prevention across a variety of machine elements, and covers the design of machine components as well as entire machines.

CRC Press
May 2022 : 836pp
Hb: 978-1-032-17004-6 : £135
eBook: 978-1-003-25137-8

* For full contents and more information, visit: www.routledge.com/9781032170046

Workshop Machining

A Comprehensive Guide to Manual Operation



David Harrison Newcastle College, UK

Workshop Machining is a comprehensive textbook that explains the fundamental principles of manually operating machinery to form shapes in a variety of materials. It bridges the gap between traditional toolmaking skills and programming and operation of CNC machines in a production environment. Everything is covered from the basic machine controls to advanced cutting operations using a wide range of tooling and work holding devices. Theory and practice are shown via a mixture of diagrams, text and illustrated worked examples, as well as through exercises.

Routledge

December 2021 : 474pp

Pb: 978-0-367-27839-7 : **£45.99**

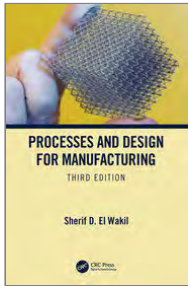
Hb: 978-0-367-27840-3 : **£120**

eBook: 978-0-429-29819-6

* For full contents and more information, visit: www.routledge.com/9780367278397

3RD EDITION

Processes and Design for Manufacturing, Third Edition



Sherif D. El Wakil University of Massachusetts
Dartmouth

Processes and Design for Manufacturing, Third Edition examines manufacturing processes from the viewpoint of the product designer, examining the selection of manufacturing methods in the early phases of design, and how this affects the constructional features of a product. Stages from design process to product development are examined, integrating evaluation of cost factors. The text emphasizes both a general design orientation and a systems approach, and covers topics such as additive manufacturing, concurrent engineering, polymeric and composite materials, cost estimation, design for assembly, and environmental factors. Appendices with materials engineering data are also included.

CRC Press

April 2019 : 551pp

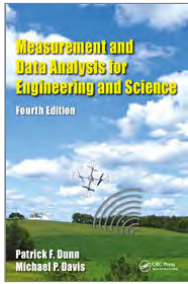
Hb: 978-1-138-58108-1 : £155

eBook: 978-0-429-50663-5

* For full contents and more information, visit: www.routledge.com/9781138581081

4TH EDITION

Measurement and Data Analysis for Engineering and Science



Patrick F Dunn , Michael P. Davis

Measurement and Data Analysis for Engineering and Science, Fourth Edition, provides up-to-date coverage of experimentation methods in science and engineering. This edition adds five new "concept chapters" to introduce major areas of experimentation generally before the topics are treated in detail, to make the text more accessible for undergraduate students. These feature Measurement System Components, Assessing Measurement System Performance, Setting Signal Sampling Conditions, Analyzing Experimental Results, and Reporting Experimental Results. More practical examples, case studies, and a variety of homework problems have been added; and MATLAB and Simulink resources have been updated.

CRC Press

December 2017 : 588pp

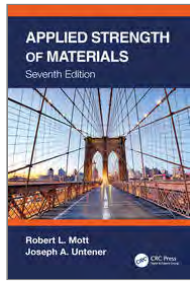
Hb: 978-1-138-05086-0 : **£165**

eBook: 978-1-315-16858-6

* For **full contents** and more information, visit: www.routledge.com/9781138050860

7TH EDITION

Applied Strength of Materials



Robert L. Mott University of Dayton, USA, **Joseph A. Untener** University of Dayton, USA

Introducing the theoretical background of the subject, with a strong visual component, the book equips the reader with problem-solving techniques. The updated seventh edition incorporates new technologies, with a pedagogical approach. It emphasizes realistic engineering applications for the analysis and design of structural members. A "Big Picture" section starts each chapter to help students grasp the overall objectives and their application in industrial applications. Step-by-step problem-solving approaches are included throughout the book. While calculus is used sparingly, detailed developments of important design-related formulas are provided.

CRC Press

July 2021 : 1172pp

Pb: 978-1-032-00222-4 : **£61.99**

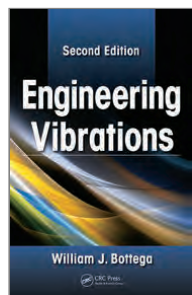
Hb: 978-0-367-82078-7 : **£155**

eBook: 978-1-003-17320-5

* For full contents and more information, visit: www.routledge.com/9781032002224

2ND EDITION

Engineering Vibrations



William J. Bottega Rutgers University, Piscataway, New Jersey, USA

This text emphasizes fundamental principles along with practical problem solving with a mathematically rigorous yet accessible approach. It uses illustrative examples and case studies to reinforce the concepts, encourages effective interpretation of results, and assists in learning the techniques and procedures. It includes more than 500 illustrations, tabulated results of case studies, a table of operators of various one-dimensional continua, and an in depth discussion of two-dimensional continua. It also offers problem-solving flowcharts for solving forced vibration problems for discrete and continuous systems.

CRC Press
December 2014 : 928pp
Hb: 978-1-439-83035-2 : £175
eBook: 978-0-429-15202-3

* For full contents and more information, visit: www.routledge.com/9781439830352

Experimental Vibro-acoustics

In-situ and blocked force methods for component-based simulation and virtual prototyping



Andrew Moorhouse University of Salford, UK, **Joshua Meggitt** University of Salford, UK

This first comprehensive practical engineering guide to using vibro-acoustic data in a component-based approach to the analysis, simulation, virtual prototyping and 'digital twinning' of machines and mechanical systems. It gives a full set of practical and theoretical tools to characterise, combine and recombine components into virtual assemblies and predict vibration and audible sound, including the in situ blocked force method. Principles of sources, components, assemblies and interfaces are followed by techniques of measurement, data processing and uncertainties, then case studies and a detailed example for design engineers across transport, industrial and building engineering.

CRC Press
August 2025 : 384pp
Hb: 978-1-032-47971-2 : £150

* For full contents and more information, visit: www.routledge.com/9781032479712

Vibration Testing and Applications in System Identification of Civil Engineering Structures



Heung-Fai Lam City University of Hong Kong, **Jia-Hua Yang** Tongji University, China

This book covers vibration testing and identification of dynamic structural systems: structural dynamics, methods of modal analysis and model identification, vibration testing with a detailed measurement system, software, practical applications, and case studies of full-scale structures. It gives Masters students the theories of system identification and empowers them to apply this in practice.

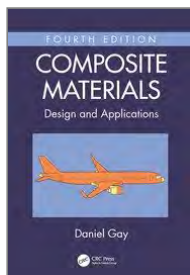
CRC Press
December 2024 : 424pp
Pb: 978-1-032-29839-9 : £52.99
Hb: 978-1-138-33288-1 : £135
eBook: 978-0-429-44586-6

* For full contents and more information, visit: www.routledge.com/9781032298399

4TH EDITION

Composite Materials

Design and Applications



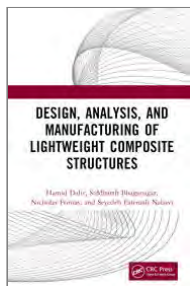
Daniel Gay Institut Clément Ader, University of Toulouse, France

For decades, *Composite Materials: Design and Applications* has guided readers on the efficient design of structural composite parts and has illustrated challenges encountered in modern engineering practice. The Fourth Edition of this best-seller retains its pedagogical structure, featuring a technical level that rises in difficulty as the text progresses, while allowing each part to be explored independently, but has been updated to mirror recent advances and developments in manufacturing processes and applications. This book serves as a textbook for advanced students studying composite materials design, as well as a handy reference for industry professionals working with composite materials.

CRC Press
September 2022 : 640pp
Hb: 978-1-032-04308-1 : **£120**
eBook: 978-1-003-19578-8

* For full contents and more information, visit: www.routledge.com/9781032043081

Design, Analysis, and Manufacturing of Lightweight Composite Structures



Hamid Dalir , Siddharth Bhaganagar , Nicholas Frimas , Seyedeh Fatemah Nabavi

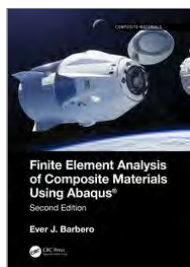
Discussing the mechanical properties of advanced composites & their materials, the book describes testing, evaluation & sustainability in mfg. Looking at how composite materials can form structural components, it focuses on how to design & analyse these materials as appropriate to different applications. It discusses micromechanics, stiffness matrices & numerical calculations using MATLAB, Excel and Python. It covers failure, strain and stress, alongside finite element analysis of composites. The book is suitable for students & researchers in the field of composites, mechanical design, micromechanics, mechanics of solids & material science.

CRC Press
February 2024 : 214pp
Hb: 978-1-032-55140-1 : **£94.99**
eBook: 978-1-003-42919-7

* For full contents and more information, visit: www.routledge.com/9781032551401

2ND EDITION

Finite Element Analysis of Composite Materials using Abaqus®



Ever J. Barbero , Ever J. Barbero West Virginia University, Morgantown, USA

Series: Composite Materials

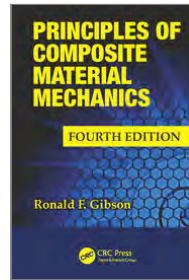
Developed from the author's course on advanced mechanics of composite materials, *Finite Element Analysis of Composite Materials with Abaqus™* shows how powerful finite element tools address practical problems in the structural analysis of composites. This Second Edition updates all examples, sample code, and problems to Abaqus 2020. Aimed at advanced students and professional engineers, this text features 60+ fully developed examples, 80+ end-of-chapter exercises, and 50+ pieces of Abaqus pseudo-code that illustrate solutions to example problems. A companion website offers relevant model files for download, enabling readers to easily reproduce the examples and complete the exercises.

CRC Press
May 2023 : 571pp
Hb: 978-0-367-62145-2 : **£100**
eBook: 978-1-003-10815-3

* For full contents and more information, visit: www.routledge.com/9780367621452

4TH EDITION

Principles of Composite Material Mechanics



Ronald F. Gibson University of Nevada, Reno, USA

Series: Mechanical Engineering

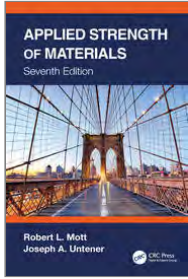
This book covers a unique blend of classical and modern mechanics of composites technologies. The fourth edition reflects the current state of the art, fresh insight gleaned from the author's ongoing composites research, and pedagogical improvements based on feedback from students, colleagues, and the author's own course notes. New worked-out examples and homework problems are added in most chapters, example problems and homework problems are now integrated within the chapters, and answers to selected homework problems are featured in the back of the book.

CRC Press
February 2016 : 698pp
Hb: 978-1-498-72069-4 : **£130**
eBook: 978-0-429-19058-2

* For full contents and more information, visit: www.routledge.com/9781498720694

7TH EDITION

Applied Strength of Materials



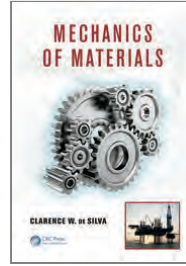
Robert L. Mott University of Dayton, USA, **Joseph A. Untener** University of Dayton, USA

Introducing the theoretical background of the subject, with a strong visual component, the book equips the reader with problem-solving techniques. The updated seventh edition incorporates new technologies, with a pedagogical approach. It emphasizes realistic engineering applications for the analysis and design of structural members. A "Big Picture" section starts each chapter to help students grasp the overall objectives and their application in industrial applications. Step-by-step problem-solving approaches are included throughout the book. While calculus is used sparingly, detailed developments of important design-related formulas are provided.

CRC Press
July 2021 : 1172pp
Pb: 978-1-032-00222-4 : £61.99
Hb: 978-0-367-82078-7 : £155
eBook: 978-1-003-17320-5

* For full contents and more information, visit: www.routledge.com/9781032002224

Mechanics of Materials



Clarence W. de Silva University of British Columbia, Canada

Series: Applied and Computational Mechanics

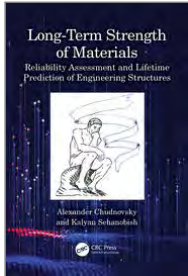
This book incorporates the fundamentals into analytical methods, modeling approaches, numerical methods, experimental procedures, and design techniques throughout. Concepts, approaches, and tools are demonstrated through a large number of examples and case studies. It is an outgrowth of the author's experience in teaching courses in mechanics of materials, statics, dynamics, modeling, vibration, instrumentation, testing, design, and control. The practical considerations, design issues, engineering techniques, and applications, and the simplified snapshot-style presentation of advanced theory and concepts, make this a useful reference for professionals as well.

CRC Press
August 2013 : 466pp
Hb: 978-1-439-87736-4 : £130
eBook: 978-0-429-06562-0

* For full contents and more information, visit: www.routledge.com/9781439877364

Long-Term Strength of Materials

Reliability Assessment and Lifetime Prediction of Engineering Structures



Alexander Chudnovsky University of Illinois at Chicago, USA, **Kalyan Sehanobish** The Dow Chemical Company, USA

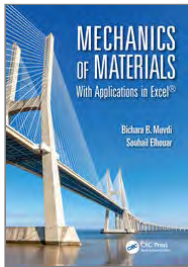
This textbook introduces the thermodynamics of irreversible processes along with entropy to address the time dependency of fracture. Working from observations of structural failure, the book identifies the principal failure types such as brittle damage and ductile failure. It then addresses the life of a structure in a specific environment and load condition, using irreversible thermodynamics and the entropy criterion to address cooperative fracture, and novel statistical fracture mechanics to address solo fracture. The book is ideal for graduate students and design engineers in civil and materials engineering, as well as mechanical and chemical engineering.

CRC Press
August 2023 : 224pp
Pb: 978-1-032-41813-1 : £49.99
Hb: 978-1-032-41814-8 : £135
eBook: 978-1-003-35984-5

* For full contents and more information, visit: www.routledge.com/9781032418131

Mechanics of Materials

With Applications in Excel



Bichara B. Muvdi Bradley University, Peoria, Illinois, USA, **Souhail Elhouar** Bradley University, Peoria, Illinois, USA

This text covers the fundamentals of the mechanics of materials—or strength of materials—in a clear and easily understandable way, incorporating numerous examples, homework problems, and review problems to ensure comprehension. It also instills practical skills for developing Microsoft® Excel® applications to solve mechanics of materials problems using numerical techniques. The book includes editable Excel spreadsheets representing all the examples featured in the text, PowerPoint® lecture slides, multimedia simulations, graphics files, and a solutions manual with qualifying course adoption.

CRC Press
June 2016 : 723pp
Hb: 978-1-466-57071-9 : £125
eBook: 978-1-315-37431-4

* For full contents and more information, visit: www.routledge.com/9781466570719

Introduction to Mechanism Design

with Computer Applications



Eric Constance, Karl B. Dyer

Introduction to Mechanism Design: with Computer Applications provides an updated approach to undergraduate Mechanism Design and Kinematics courses/modules for engineering students. The use of web-based simulations, solid modeling, and software such as MATLAB and Excel is employed to link the design process with the latest software tools for the design and analysis of mechanisms and machines. While a mechanical engineer might brainstorm with a pencil and sketch pad, the final result is developed and communicated through CAD and computational visualizations. This modern approach to mechanical design processes has not been fully integrated in most books, as it is in this new text.

CRC Press

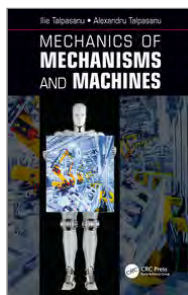
August 2018 : 760pp

Hb: 978-1-138-74065-5 : £130

eBook: 978-1-315-18326-8

* For full contents and more information, visit: www.routledge.com/9781138740655

Mechanics of Mechanisms and Machines



Ilie Talpasanu Wentworth Institute of Technology, Boston, Massachusetts, USA, **Alexandru Talpasanu**

Mechanics of Mechanisms and Machines provides a practical approach to machine dynamics and kinematics for undergraduate students and mechanical engineers. It starts by analyzing simple mechanisms, and progresses to more complex examples. It will be the only textbook to cover mechanism design through the use of graphs and generation of independent equations from a matroid form.

CRC Press

December 2018 : 610pp

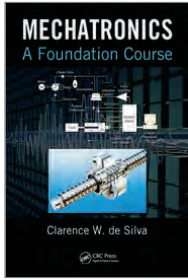
Hb: 978-1-498-73547-6 : £145

eBook: 978-0-429-39830-8

* For full contents and more information, visit: www.routledge.com/9781498735476

Mechatronics

A Foundation Course



Clarence W. de Silva University of British Columbia, Vancouver, Canada

Designed for students across all of engineering, this text offers the multidisciplinary approach needed to develop a foundation in mechatronics. It covers electrical and mechanical components, sensors and instrumentation, drives and actuators, controls, signal processing, component interfacing, modeling, and design. Practical applications and tools introduced up front are uniformly integrated throughout the book. Cases studies and worked examples that make use of MATLAB®, Simulink®, and LabView® application and case studies are included, as are numerous exercises, most based on real engineering practice.

CRC Press
June 2010 : 898pp
Hb: 978-1-420-08211-1 : £150
eBook: 978-0-429-13947-5

* For full contents and more information, visit: www.routledge.com/9781420082111

Mechatronics

An Integrated Approach



Clarence W. de Silva University of British Columbia, Vancouver, Canada

Intended as an engineering textbook that is versatile enough to span several courses in mechatronics, this book offers a strong foundation in such core subjects as dynamic system modeling, electrical components and analysis, mechanical components and analysis, robotics, drives and actuators, control systems, digital processing and hardware, communication and interfacing, software tools, design, and prototyping. The appendices cover Laplace and Fourier transform techniques and software tools including MATLAB, SIMULINK, and LabVIEW. It also emphasizes practical situations and applications with numerous worked examples, problems, and exercises and offers an entire chapter devoted to case studies.

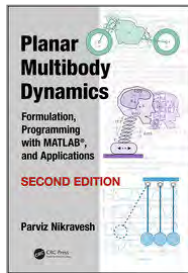
CRC Press
November 2004 : 1348pp
Hb: 978-0-849-31274-8 : £175
eBook: 978-0-429-21068-6

* For full contents and more information, visit: www.routledge.com/9780849312748

2ND EDITION

Planar Multibody Dynamics

Formulation, Programming with MATLAB®, and Applications, Second Edition



Parviz Nikravesh

Planar Multibody Dynamics: Formulation, Programming, and Applications, Second Edition enhances the quality and ease of design education with extensive use of the latest computerized design tools combined with coverage of classical design and dynamics of machinery principles. Using clear, concise language, the text introduces fundamental theories, computational methods, and program development for analyzing simple to complex mechanical systems. MATLAB® is used throughout, with examples begin with basic commands before introducing students to more advanced programming techniques. The routines developed in each chapter come together to form complete programs for different types of analysis.

CRC Press

October 2018 : 430pp

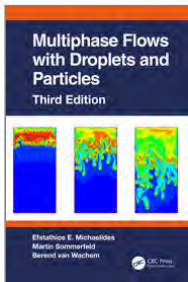
Hb: 978-1-138-09612-7 : £160

eBook: 978-1-315-10543-7

* For full contents and more information, visit: www.routledge.com/9781138096127

3RD EDITION

Multiphase Flows with Droplets and Particles, Third Edition



Efstathios E. Michaelides Texas Christian University, USA
, Martin Sommerfeld Otto-von-Guericke University
 Magdeburg, Germany, **Berend van Wachem** Otto-von-
 Guericke University Magdeburg, Germany

Multiphase Flows with Droplets and Particles, Third Edition provides an organized, pedagogical study of multiphase flows with particles and droplets. The revision presents new information on particle interactions; particle collisions; thermophoresis and Brownian movement; computational techniques and codes; the treatment of irregularly-shaped particles. An entire chapter is devoted to the flow of nanoparticles and applications of nanofluids. Designed to complement a graduate course in multiphase flows, the book can also serve as a supplement in short courses for engineers or as a stand-alone reference for engineers and scientists who work in this area.

CRC Press

October 2024 : 478pp

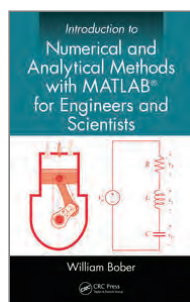
Pb: 978-0-367-54434-8 : **£61.99**

Hb: 978-0-367-54431-7 : **£155**

eBook: 978-1-003-08927-8

* For full contents and more information, visit: www.routledge.com/9780367544348

Introduction to Numerical and Analytical Methods with MATLAB® for Engineers and Scientists



William Bober Florida Atlantic University, Boca Raton, USA

This textbook teaches students how to write computer programs on the MATLAB® platform and to use many of MATLAB's built-in functions to solve engineering-type problems. To students, MATLAB's built-in functions are black boxes. By combining a textbook on MATLAB with basic numerical and analytical analysis, the mystery of what the black boxes contain is somewhat alleviated. Within each chapter there are exercises related to the topics just covered. The text contains many examples from mechanical, civil, aeronautical, and electrical engineering.

CRC Press

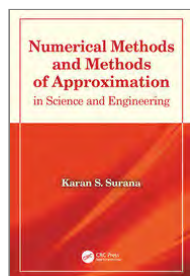
November 2013 : 556pp

Hb: 978-1-466-57602-5 : £145

eBook: 978-0-429-10161-8

* For full contents and more information, visit: www.routledge.com/9781466576025

Numerical Methods and Methods of Approximation in Science and Engineering



Karan S. Surana University of Kansas, USA

Numerical Methods and Methods of Approximation in Science and Engineering prepares students and other readers for advanced studies involving applied numerical and computational analysis. Focused on building a sound theoretical foundation, it uses a clear and simple approach backed by numerous worked examples to facilitate understanding of numerical methods and their application. Readers will learn to structure a sequence of operations into a program, using the programming language of their choice; this approach leads to a deeper understanding of the methods and their limitations. The text features highlighted examples, numerous problems, and a complete Solutions Manual for instructors.

CRC Press

November 2018 : 498pp

Hb: 978-0-367-13672-7 : £155

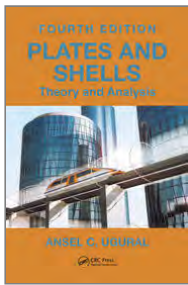
eBook: 978-0-429-02828-1

* For full contents and more information, visit: www.routledge.com/9780367136727

4TH EDITION

Plates and Shells

Theory and Analysis, Fourth Edition



Ansel C. Ugural New Jersey Institute of Technology,
Newark, USA

Series: Applied and Computational Mechanics

Noted for its practical, accessible approach to senior and graduate-level engineering mechanics, *Plates and Shells: Theory and Analysis* is a long-time bestselling text on the subjects of elasticity and stress analysis. Many new examples and applications are included to review and support key foundational concepts. Advanced methods are discussed and analyzed, accompanied by illustrations. Problems are carefully arranged from the basic to the more challenging level. Computer/numerical approaches (Finite Difference, Finite Element, MATLAB) are introduced, and MATLAB code for selected illustrative problems and a case study is included.

CRC Press

October 2017 : 618pp

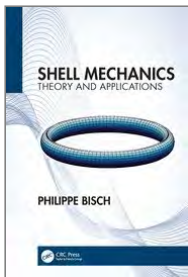
Hb: 978-1-138-03245-3 : £190

eBook: 978-1-315-10462-1

* For full contents and more information, visit: www.routledge.com/9781138032453

Shell Mechanics

Theory and Applications



Philippe Bisch Ecole des Ponts ParisTech, France

This book is devoted to shells, a natural or human construction, whose modelling as a structure was particularly developed during the 20th century, leading to current numerical models. It highlights the very strong link between the deformation of geometric surfaces and the mechanics of shells. The book is based on the knowledge acquired by the reader in structural mechanics and provides the necessary information on the geometry of surfaces. It is particularly aimed at students in the fields of engineering using mechanics, as well as professionals wishing to deepen their knowledge of shells.

CRC Press

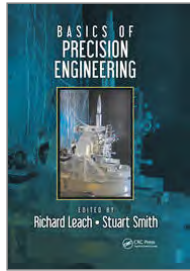
September 2023 : 562pp

Hb: 978-1-138-31059-9 : £140

eBook: 978-0-429-44040-3

* For full contents and more information, visit: www.routledge.com/9781138310599

Basics of Precision Engineering



Edited by **Richard Leach , Stuart T. Smith**

BASICS OF PRECISION MACHINERY provides students and professionals a comprehensive and up-to-date survey of the field. The text reviews basic dynamics of machinery and kinematics concepts, and the design of mechanisms. Engineering materials selection and behavior is examined, along with environmental isolation. Metrology principles and applications, and dimensional metrology, are presented in detail, since these topics are essential to precision engineering; uncertainty analysis and probability are covered as well. Numerous figures, tables, examples and problems are included throughout the text, and a Solutions Manual and Figure Slides are available for professors who adopt the textbook.

CRC Press

March 2021 : 676pp

Pb: 978-0-367-78139-2 : **£45.99**

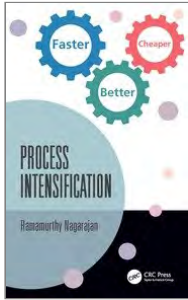
Hb: 978-1-498-76085-0 : **£150**

eBook: 978-1-351-20411-8

* For full contents and more information, visit: www.routledge.com/9780367781392

Process Intensification

Faster, Better, Cheaper



Ramamurthy Nagarajan IIT Madras, India

Process Intensification: Faster, Better, Cheaper presents basic concepts and applications of Process Intensification (PI) and links their common effects across processes. It defines two fundamental parameters, PI factor, and Cost Impact (CI) factor, and uses these to analyze various applications where PI has been carried out. The book is intended for senior undergraduate chemical and mechanical engineering students taking courses in Process Design, Process Optimization, Process Synthesis, and Process Intensification. Each chapter investigates a specific application, discusses the key PI principles, and includes problem sets and examples.

CRC Press

April 2023 : 270pp

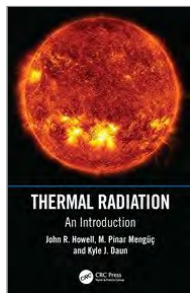
Hb: 978-1-032-25477-7 : **£100**

eBook: 978-1-032-25486-9 : **£91.99**

* For full contents and more information, visit: www.routledge.com/9781032254777

Thermal Radiation

An Introduction



John R. Howell University of Texas, Austin, USA, **M. Pinar Mengüç** Ozyegin Universities, Istanbul, Turkey, **Kyle J. Daun** University of Waterloo, Waterloo, Canada

This book is a complete text for a one-semester introductory graduate course on radiative energy transfer. It bridges the gap between a basic introduction and comprehensive coverage of thermal radiation, focusing on insight into radiative transfer as practiced by engineers. The textbook is intended for instructors and graduate students in a first-year course on radiative heat transfer or advanced heat transfer. Covering radiative transfer among surfaces, with an introduction to the effects of participating media between surfaces, the book includes surface and medium property characteristics and solution of the radiative transfer equation in simple geometries.

CRC Press

March 2023 : 476pp

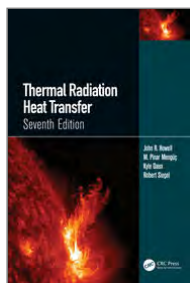
Hb: 978-1-032-01531-6 : **£86.99**

eBook: 978-1-032-42254-1 : **£86.99**

* For full contents and more information, visit: www.routledge.com/9781032015316

7TH EDITION

Thermal Radiation Heat Transfer



John R. Howell University of Texas, Austin, USA, **M. Pinar Mengüç** Ozyegin Universities, Istanbul, Turkey, **Kyle Daun** University of Waterloo, Waterloo, Canada, **Robert Siegel** Heat Transfer Consultant, Shaker Heights, Ohio, USA

The Seventh Edition of this classic text outlines the fundamental physical principles of thermal radiation, as well as analytical and numerical techniques for quantifying radiative transfer between surfaces and within participating media. The textbook includes newly expanded sections on surface properties, electromagnetic theory, scattering and absorption of particles, near-field radiative transfer, and emphasizes the broader connections to thermodynamic principles. Sections on inverse analysis and Monte Carlo methods have been updated, along with new material on manufacturing, renewable energy, climate change, building energy efficiency, and biomedical applications.

CRC Press

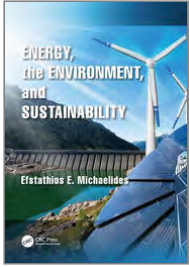
December 2020 : 1040pp

Hb: 978-0-367-34707-9 : **£130**

eBook: 978-0-429-32730-8

* For full contents and more information, visit: www.routledge.com/9780367347079

Energy, the Environment, and Sustainability



Efstathios E. Michaelides Texas Christian University, USA

Series: Mechanical and Aerospace Engineering Series

Energy and the Environment explains in simple terms what the energy demand is at the present, what the environmental effects of energy use are, and what can be accomplished to alleviate the environmental effects of energy use and ensure adequate energy supply. Though technical in approach, the text uses simple explanations of engineering processes and systems and algebra-based math to be comprehensible to students in a range of disciplines. Schematic diagrams, quantitative examples, and numerous problems will help students make quantitative calculations. This will assist them in comprehending the complexity of the energy-environment balance, and to analyze and evaluate proposed solutions.

CRC Press

April 2018 : 483pp

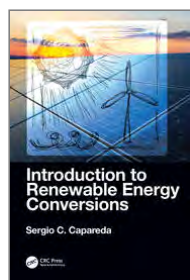
Pb: 978-1-138-03844-8 : **£135**

Hb: 978-1-138-48917-2 : **£150**

eBook: 978-1-315-17735-9

* For full contents and more information, visit: www.routledge.com/9781138038448

Introduction to Renewable Energy Conversions



Sergio Capareda Texas A&M University, College Station, USA

Introduction to Renewable Energy Conversions examines all the major renewable energy conversion technologies, with the goal of enabling readers to formulate realistic resource assessments. The text provides step-by-step procedures for assessing renewable energy options, and then moves to the design of appropriate renewable energy strategies. The goal is for future engineers to learn the process of making resource estimates, through the introduction of more than 140 solved problems (and equal number of solved problems for teachers), over 165 engineering related equations, more than 120 figures and numerous tables to explain each renewable energy conversion type.

CRC Press

August 2019 : 456pp

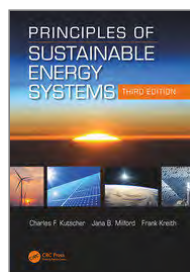
Hb: 978-0-367-18850-4 : £115

eBook: 978-0-429-19910-3

* For full contents and more information, visit: www.routledge.com/9780367188504

3RD EDITION

Principles of Sustainable Energy Systems, Third Edition



Frank Kreith , Charles F. Kutscher National Renewable Energy Laboratory, Golden, Colorado, USA, **Jana B. Milford** University of Colorado Boulder, USA

Series: Mechanical and Aerospace Engineering Series

Principles of Sustainable Energy Systems, 3rd Edition surveys the range of sustainable energy sources and the tools that engineers, scientists, and policy makers use to analyze energy generation, usage, and future trends. The text provides complete and up-to-date coverage of all renewable technologies, including solar and wind power, biofuels, hydroelectric, nuclear, ocean power, and geothermal energy. The economics of energy are introduced, with the SAM software package integrated so students can explore the dynamics of energy usage and prediction. Climate and environmental factors in energy use are integrated to give a complete picture of sustainable energy analysis and planning.

CRC Press

September 2018 : 654pp

Hb: 978-1-498-78892-2 : £195

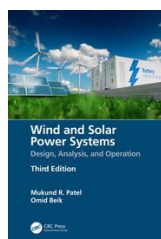
eBook: 978-0-429-48558-9

* For full contents and more information, visit: www.routledge.com/9781498788922

3RD EDITION

Wind and Solar Power Systems

Design, Analysis, and Operation



Mukund R. Patel U.S. Merchant Marine Academy, USA, **Omid Beik** Enercs Inc., Canada

This book provides technological and socio-economic coverage of renewable energy. It discusses wind power technologies, solar photovoltaic technologies, large-scale energy storage technologies, and ancillary power systems. In this new edition, the book addresses advancements that have been made in renewable energy: solar systems have seen great transformation, the power electronics converters, their control and operation, have been improved, and multi-stage, multi-phase systems have been proposed and put into installation. The text has been revised to include up-to-date material, statistics, and current technology trends.

CRC Press

March 2025 : 408pp

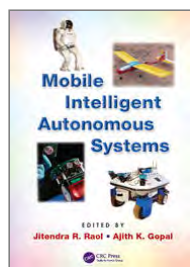
Pb: 978-0-367-71620-2 : £52.99

Hb: 978-0-367-47693-9 : £120

eBook: 978-1-003-04295-2

* For full contents and more information, visit: www.routledge.com/9780367716202

Mobile Intelligent Autonomous Systems



Edited by **Jitendra R. Raol** Ramaiah Institute of Technology, India, **Ajith K. Gopal**

Going beyond the traditional field of robotics to include other mobile vehicles, this reference and "recipe book" describes important theoretical concepts, techniques, and applications that can be used to build truly mobile intelligent autonomous systems (MIAS). With the infusion of neural networks, fuzzy logic, and genetic algorithm paradigms for MIAS, it blends modeling, sensors, control, estimation, optimization, signal processing, and heuristic methods in MIAS and robotics, and includes examples and applications throughout. Offering a comprehensive view of important topics, it helps readers understand the subject from a system-theoretic and practical point of view.

CRC Press

March 2017 : 832pp

Pb: 978-1-138-07245-9 : **£80.99**

Hb: 978-1-439-86300-8 : **£205**

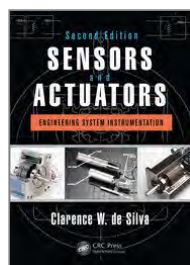
eBook: 978-0-429-10481-7

* For full contents and more information, visit: www.routledge.com/9781138072459

2ND EDITION

Sensors and Actuators

Engineering System Instrumentation, Second Edition



Clarence W. de Silva University of British Columbia, Vancouver, Canada

This introductory textbook on engineering system instrumentation emphasizes sensors, transducers, actuators, and devices for component interconnection. The book deals with "instrumenting" an engineering system through the incorporation of suitable sensors, actuators, and associated interface hardware including filters, amplifiers and other signal modifiers. In view of the practical considerations, design issues, and industrial techniques that are presented throughout the book, and in view of the simplified and snap-shot style presentation of more advanced theory and concepts, it also serves as a useful reference for engineers, technicians, project managers, and other practicing professionals in industry and in research laboratories.

CRC Press

July 2015 : 848pp

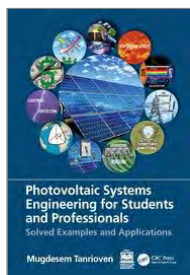
Hb: 978-1-466-50681-7 : **£175**

eBook: 978-0-429-09643-3

* For full contents and more information, visit: www.routledge.com/9781466506817

Photovoltaic Systems Engineering for Students and Professionals

Solved Examples and Applications



Mugdesem Tanrioven Yildiz Technical University, Turkey

Photovoltaic Systems Engineering for Students and Professionals: Solved Examples and Applications examines photovoltaic (PV) power plants in a holistic way. PV installations of all types and sizes- from the smallest plant element to the largest system components- are approached from an electrical engineering perspective, and further explained through worked examples. It presents the different forms of energy and the energy conversions between them in a clear and understandable way. The book is both an essential resource for students as well as practicing engineers working in the solar photovoltaic areas and critical work for all electrical engineers.

CRC Press

October 2023 : 620pp

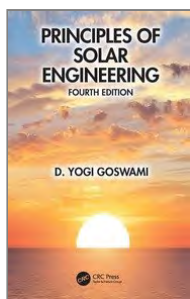
Hb: 978-1-032-54185-3 : £130

eBook: 978-1-003-41557-2

* For full contents and more information, visit: www.routledge.com/9781032541853

4TH EDITION

Principles of Solar Engineering



D. Yogi Goswami University of South Florida, USA

Principles of Solar Engineering, Fourth Edition addresses the need for solar resource assessment and highlights improvements and advancements involving photovoltaics and solar thermal technologies, grid power, and energy storage. With updates made to every chapter, the book discusses new technologies in photovoltaics, such as organic, dye-sensitized and perovskite solar cells, and the design of solar systems and power plants. It features battery energy storage for distributed and bulk storage and electrical integration with the main solar systems. The book is intended for senior undergraduate and graduate engineering students in Energy Engineering and Solar Energy courses.

CRC Press

September 2022 : 656pp

Hb: 978-1-032-15500-5 : £135

eBook: 978-1-003-24438-7

* For full contents and more information, visit: www.routledge.com/9781032155005

Collision Actions on Structures



Arnold C.Y. Yong Research Fellow, Malaysia, **Nelson T.K. Lam** University of Melbourne, Australia, **Scott J. Menegon** Swinburne University of Technology, Australia

This book is concerned with collision of a moving, fallen or flying object on a rigid barrier or a structural element, and the transmission of the transient action to the rest of a structural system. Engineers typically have little to draw on for analysis and design. Modelling software, such as FEM, is challenging to use effectively, physical experimentation is costly, and there is little or no regulatory documentation. This textbook for graduate students and guide for practitioners sets out solid principles and much of the methodology conveyed in the book has been validated experimentally.

CRC Press

November 2024 : 378pp

Pb: 978-0-367-67830-2 : **£45.99**

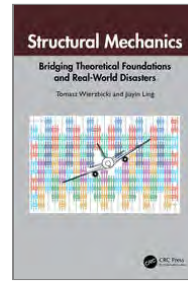
Hb: 978-0-367-67817-3 : **£96.99**

eBook: 978-1-003-13303-2

* For full contents and more information, visit: www.routledge.com/9780367678302

Structural Mechanics

Bridging Theoretical Foundations and Real-World Disasters



Tomasz Wierzbicki, **Jiayin Ling**

This book originated from the lecture notes of Professor Tomasz Wierzbicki who taught at MIT and Stanford University. The notes were amended and improved over the years to provide a link between rigorous theoretical foundations with solutions to important engineering problems. The book discusses complex man-made structures under accidental impact or explosive loads resulting in the loss of life and/or extensive property, infrastructural, and environmental damage. The book is not restricted to the accident reconstruction only. The additional 17 lectures provide theoretical foundations for the elastic structures, plastic plates and shells, and ductile fracture.

CRC Press

December 2024 : 588pp

Hb: 978-1-032-84281-3 : **£155**

eBook: 978-1-003-51714-6

* For full contents and more information, visit: www.routledge.com/9781032842813

Fundamentals of Structural Engineering

A Problem-Based Approach



Tanvir Mustafy Military Inst. of Science and Tech, BD

This book provides an introduction to the principles of structural engineering using a problem-based approach. It covers the basic concepts of structural analysis and design, including statics, strength of materials, and mechanics of materials. The text emphasizes the application of these principles to real-world structural engineering problems and includes numerous example problems and case studies to illustrate key concepts. The problem-based approach helps students develop their problem-solving skills, critical thinking abilities, and intuition for structural engineering.

CRC Press

December 2024 : 570pp

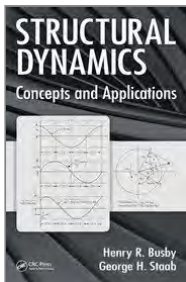
Hb: 978-1-032-63805-8 : **£100**

eBook: 978-1-032-63807-2

* For full contents and more information, visit: www.routledge.com/9781032638058

Structural Dynamics

Concepts and Applications



Henry R. Busby Ohio State University, Columbus, USA, **George H. Staab** Ohio State University, Columbus, USA

Structural Dynamics: Concepts and Applications focuses on dynamic problems in mechanical, civil and aerospace engineering through the equations of motion. The text explains structural response from dynamic loads and the modeling and calculation of dynamic responses in structural systems. A range of applications is included, from various engineering disciplines. Coverage progresses consistently from basic to advanced, with emphasis placed on analytical methods and numerical solution techniques. Stress analysis is discussed, and MATLAB applications are integrated throughout. A solutions manual and figure slides for classroom projection are available for instructors.

CRC Press

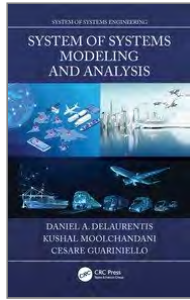
August 2017 : 598pp

Hb: 978-1-498-76594-7 : **£185**

eBook: 978-1-315-12002-7

* For full contents and more information, visit: www.routledge.com/9781498765947

System of Systems Modeling and Analysis



Daniel A. DeLaurentis Purdue University, USA, **Kushal Moolchandani** Purdue University, USA, **Cesare Guariniello** Purdue University, USA

Series: System of Systems Engineering

System-of-Systems Modeling and Analysis provides the reader with motivation, theory, methodology, and examples of modeling and analysis for system of system problems. The book is intended for senior undergraduate students in engineering programs studying System-of-Systems Modeling, System-of-Systems Analysis, and System-of-Systems Engineering courses. Professional engineers will also benefit from Methods, Tools, and Processes (MTP) and examples as a baseline for specific user applications. Providing a bridge between theory and practice for modeling and analysis of SoS, this book includes generalized concepts and Methods, Tools, and Processes (MTP) applicable to SoS.

CRC Press

December 2022 : 287pp

Hb: 978-1-032-13830-5 : £105

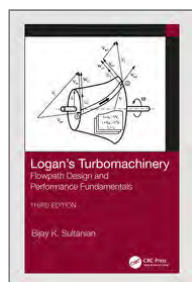
eBook: 978-1-003-23101-1

* For full contents and more information, visit: www.routledge.com/9781032138305

3RD EDITION

Logan's Turbomachinery

Flowpath Design and Performance Fundamentals, Third Edition



Bijay Sultanian University of Central Florida, FL

Series: Mechanical Engineering

Logan's Turbomachinery: Flowpath Design and Performance Fundamentals, Third Edition is the long-awaited revision of this classic textbook, thoroughly updated by Dr. Bijay Sultanian. While the basic concepts remain constant, turbomachinery design has advanced since the Second Edition was published in 1993. Airfoils in modern turbomachines feature three-dimensional geometries, Computational Fluid Mechanics (CFD) has become a standard design tool, and major advances have been made in the materials and manufacturing technologies that affect turbomachinery design. The new edition addresses these trends to best serve today's students, and design engineers working in turbomachinery industries.

CRC Press

January 2019 : 341 pp

Hb: 978-1-138-19820-3 : £120

eBook: 978-1-315-22648-4

* For full contents and more information, visit: www.routledge.com/9781138198203

Turbomachinery

Concepts, Applications, and Design



V. Dakshina Murty

Turbomachinery: Concepts, Applications, and Design is an introductory turbomachinery textbook aimed at seniors and first year graduate students, giving balanced treatment of both the concepts and design aspects of turbomachinery, based on sound analysis and a strong theoretical foundation. The text has three sections, Basic Concepts, Incompressible Fluid Machines; and Compressible Fluid Machines. Emphasis is on straightforward presentation of key concepts and applications, with numerous examples and problems that clearly link theory and practice over a wide range of engineering areas. Problem solutions and figure slides are available for instructors adopting the text for their classes.

CRC Press

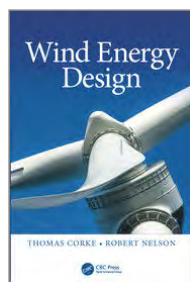
January 2018 : 326 pp

Hb: 978-1-138-64069-6 : £175

eBook: 978-1-315-20512-0

* For full contents and more information, visit: www.routledge.com/9781138640696

Wind Energy Design



Thomas Corke University of Notre Dame, USA, **Robert Nelson** University of Notre Dame, USA

Wind Energy Systems is designed for undergraduate engineering courses, with a focus on multidisciplinary design of a wind energy system. The text covers basic wind power concepts and components - wind characteristics and modeling, rotor aerodynamics, lightweight flexible structures, wind farms, aerodynamics, wind turbine control, acoustics, energy storage, and economics. These topics are applied to produce a new conceptual wind energy design, showing the interplay of various design aspects in a complete system. An ongoing case study demonstrates the integration of various component topics, and MATLAB examples are included to show computerized design analysis procedures and techniques.

CRC Press

April 2018 : 352pp

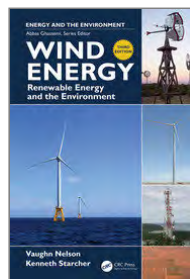
Hb: 978-1-138-09602-8 : £135

eBook: 978-1-315-10546-8

* For full contents and more information, visit: www.routledge.com/9781138096028

3RD EDITION

Wind Energy: Renewable Energy and the Environment



Vaughn Nelson West Texas A&M University, Canyon, USA, **Kenneth Starcher** West Texas A&M University, Canyon, USA

Series: Energy and the Environment

This book explores the wind industry from its inception in the 1970s to today; presents the design, aerodynamics, operation, control, applications, and different types of wind turbines; and provides ample reasons to shift from fossil fuels to renewable energy. It also discusses the political and economic factors regarding the adoption of wind as an energy source. It covers the characteristics of wind, such as shear, power potential, and turbulence, and discusses the measurement and siting of individual wind turbines and wind farms. This new edition is fully updated throughout, and adds new material on wind forecasting, offshore wind, decommissioning and repowering wind farms, and more.

CRC Press

November 2018 : 326pp

Hb: 978-1-138-61534-2 : £130

eBook: 978-0-429-46315-0

* For full contents and more information, visit: www.routledge.com/9781138615342

K.

Processes and Design for Manufacturing, Third Edition	58
Process Intensification	71

R

Reliability Engineering	34
Reverse Engineering of Algebraic Inequalities	34
Road Vehicle Dynamics	9

S

Sensors and Actuators	75
Shell Mechanics	69
Spreadsheet Problem Solving and Programming for Engineers and Scientists	32
Structural Dynamics	77
Structural Mechanics	77
System Dynamics	21
System of Systems Modeling and Analysis	78

T

The Engineering Design Primer	26
The Finite Element Method	38
The Finite Element Method for Boundary Value Problems	39
The Finite Element Method for Initial Value Problems	39
The Finite Element Method in Heat Transfer and Fluid Dynamics	40
The Future of Road Transportation	8
Theory and Practice of Decision Making in Regulation, Diagnostics and Reliability of Machine34	
Theory of Differential Equations in Engineering and Mechanics	32
Thermal Energy Systems	20
Thermal Radiation	72
Thermal Radiation Heat Transfer	72
Thermodynamics	53
Thermodynamics and Heat Power, Ninth Edition .53	
Thermodynamics for Engineers	36
T Level Engineering	52
Turbomachinery	79

V

Vehicle Dynamics, Stability, and Control	9
Vibration Testing and Applications in System Identification of Civil Engineering Structures	61

W

Wind and Solar Power Systems	74
Wind Energy: Renewable Energy and the Environment	80
Wind Energy Design	80
Workshop Machining	57

- A.**
 Ames, Tang 3
 Anderson 44
 Anderson, Tannehill, Pletcher, Munipalli, Shankar . 14
 Angoshtari, Matin 38
 Annamalai, Puri, Jog 6
 Armstrong 37
- B.**
 Barbero, Barbero 62
 Baruh 48
 Batu 42
 Berman, Rosenkranz, Marian 54
 Bhattacharjee 5
 Bhattacharjee 40
 Bhattacharjee 38
 Bies, Hansen, Howard, Hansen 2
 Bird 33
 Bird 31
 Bird 31
 Bird, Ross 52
 Bisch 69
 Bober 68
 Bober 49
 Bonnick 9
 Bottega 61
 Bryden, Ragland, Kong 12
 Busby, Staab 77
- C.**
 Capareda 74
 Capareda 11
 Cassoret 23
 Chau 31
 Chau 32
 Chen, Liu 38
 Cheng 11
 Childs, Conkey 48
 Chudnovsky, Sehanobish 63
 Chung, Kapoor 51
 Clifford 52
- Clifford 52
 Clough, Chapra 32
 Coates, Sooklal 45
 Constans, B. Dyer 64
 Corke, Nelson 80
 Cundiff, Kocher 43
- D.**
 Dakshina Murty 79
 Dalir, Bhaganagar, Frimas, Fatemah Nabavi . . . 62
 Darbyshire, Gibson 52
 Das, Panigrahi 19
 DeLaurentis, Moolchandani, Guariniello . . . 78
 Denton, Pells 10
 Denton, Pells 10
 Denton, Pells 8
 de Silva 65
 de Silva 65
 de Silva 21
 de Silva 75
 de Silva 63
 Dixit, Dixit 22
 Dr. Ali Jamnia 69
- E.**
 Ehsani, Gao, Longo, Ebrahimi 8
 El Wakil 58
 Esfandiari, Lu, Lu 21
- F.**
 F. Naterer 4
 F. Dunn, P. Davis 59
 Fenner, Reddy 5
- G.**
 Gabriel Ghionea 25
 Gad 21
 Garg, Mathur, Bhatia 47
 Gaskell, Laughlin 53
 Gay 62
 Ghazanfarian 42
 Ghiaasiaan 18
 Gibson 62
 Goswami 76
- Granet, Alvarado, Bluestein 53
 Gu 47
- H.**
 Hailu, Varchola, Hlbocan 43
 Han, Wright 14
 Han, Wright 4
 Hansen, Hansen 2
 Harrison 57
 Hossay 10
 Houpis, Sheldon 17
 Howell, Mengüç, Daun 72
 Howell, Mengüç, Daun, Siegel 72
 Hsu 43
- I.**
 Islam, Al Faruque, Zoghi, Kalevela 35
 Islam, Mazumder, Ahmed 27
- J.**
 Jaluria 20
 Janna 50
 Janna 41
- K.**
 Kakac, Yener, Naveira-Cotta 15
 Kakac, Yener, Pramuhanjaroenkij 18
 Kakaç, Liu, Pramuhanjaroenkij 46
 Karlsson, Quintiere 12
 Karnopp 9
 Kassir 22
 Kleinstreuer 3
 Krarti 47
 Kreith, Kutscher, Milford 74
- L.**
 Lam, Yang 61
 Leach, Smith 70
 Lee, Li 5
 Leong, Heah, Ong 28
 Lindstedt, Giradzki, Golak 34
 Livesey 52
 Livesey 9
- M.**
 Majumdar 14
- Mase, Smelser, Rossmann 16
 Michaelides 73
 Michaelides 24
 Michaelides, Sommerfeld, van Wachem 67
 Middleton 31
 Moorhouse, Meggitt 61
 Morling, Danjou 25
 Mott, Untener 60
 Mott, Untener 63
 Mueller 13
 Mustafy 77
 Mustafy, Rahman, Siddiqui 31
 Muvidi, Elhouar 63
- N.**
 Nachlas 34
 Nagarajan 71
 Nassersharif 25
 Natarajan, Kantipudi, Yang, Shiao 8
 Nelson, Starcher 80
 Nikraves 66
 Nyemba 25
- O.**
 Ozisik, Orlande 4
- P.**
 Palm 25
 Patel, Beik 74
 Penoncello 20
 Pepper, Heinrich 38
 Peters 2
 Puthoff, Ravi 51
- Q.**
 Qin 14
 Qua, Tan, Wong, Ho, Wang, Yap, Ooi, Wong . . 29
- R.**
 Ragab, Fayed 38
 Raol, Ayyagari 17
 Raol, Gopal 75
 Rathakrishnan 41
 Reddy, Gartling 40
 Reddy, Kreider, Curtiss, Rabl 47

Revankar, Majumdar	24	Y	
Richards	26		
Rill	9	Yong, Lam, Menegon	77
Ross, Bird, Little	5	Z	
Roychowdhury	3		
Russell, Shen, Sodhi	55	Zakariyah	30
S		Zakariyah	30
Saxena	45	Zhang	43
Saxena	44		
Schobert	23		
Struble, Struble	7		
Sultanian	79		
Sultanian	42		
Surana	68		
Surana	16		
Surana, Reddy	39		
Surana, Reddy	39		
T			
T. Todinov	34		
Talpasanu, Talpasanu	64		
Tanrioven	76		
Tooley, Dingle	28		
Turner	43		
U			
Uddin	53		
Uddin	4		
Uddin	41		
Ugural	56		
Ugural	69		
Ugural	56		
V			
Vajpayee, Sarder	32		
Venkateswarlu	36		
Vick	31		
W			
Wang, Zhu, Correia, De Jesus, Lesiuk	45		
Wierzbicki, Ling	77		
Wong	36		
Wright, Gerhart	43		



VISIT ROUTLEDGE.COM

Visit www.routledge.com today to view the full range of **books** and **journals** in each subject area.

View the **latest titles**, exclusive **author interviews** and **news**, and sign up to our subject specific **eUpdates**, to receive details of new publications and special offers by email.

Look Inside Routledge Books

Did you know that many of our books now have 'Look Inside' functionality that allows you to browse online content before making any purchasing decisions?

For more information visit www.routledge.com.



