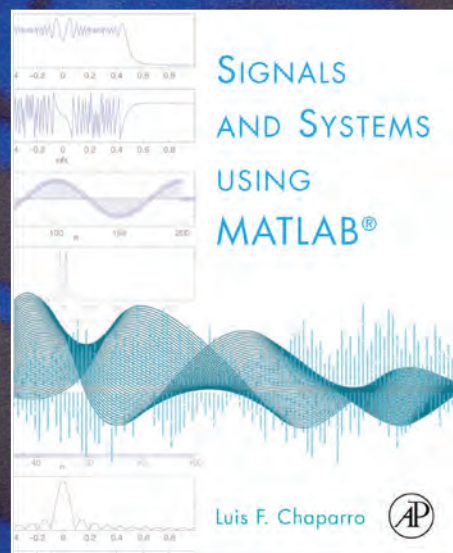
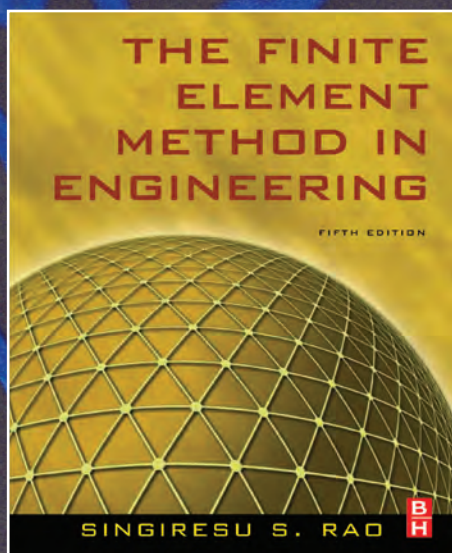
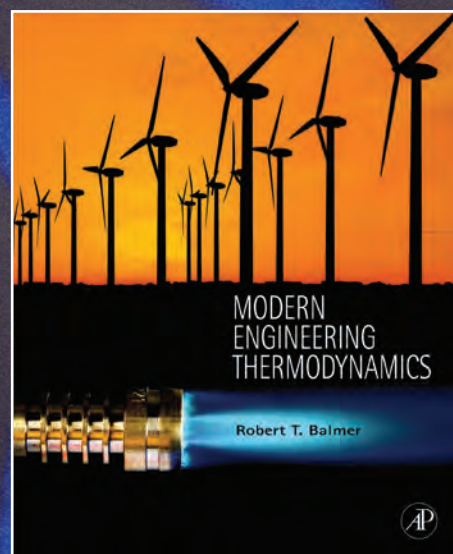
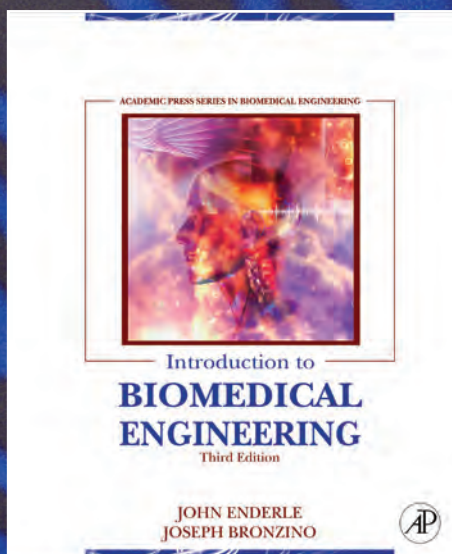


# ENGINEERING TEXTBOOKS



# 2011



imagine your course content **your** way...



Have you wanted to customize a textbook to be just the way you want it with your own embedded notes, multimedia presentations, and supplemental materials?

*If so, let Xplana help you make your textbook the way you and your students want it to be!*

Would your students be more engaged in that textbook material if they could access it on their laptop or smartphone?

The Xplana content platform transforms your favorite Elsevier textbook so that it is:

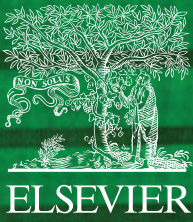


- Collaborative.** Directly interact with students and colleagues through this interactive platform.
- Customizable.** Add your own notes, presentations, and supplemental materials as you would like them seen in the textbook.
- Meaningful.** Use Xplana's rich tools to steer your students toward greater classroom success by having them focus on textbook material most relevant to their course objectives.
- Available 24/7.** Students can access Xplana from any computer or smartphone, anytime.
- Affordable.** With Xplana's electronic format, offer your students higher functionality and lower cost than print textbooks.

**Request complimentary faculty access to see what Xplana can do for your course.**

For more information, please email [textbooks@elsevier.com](mailto:textbooks@elsevier.com) for use in America, Asia, and Australia, or [email.textbook@elsevier.com](mailto:email.textbook@elsevier.com) for use in Europe, Middle East, and Africa.





Elsevier distributes all imprints appearing in this Bulletin throughout the UK and Republic of Ireland, rest of Europe, Middle East, and Africa.

#### DISCLAIMER

All prices quoted in this publication are applicable only to orders placed directly with our offices. Please note prices and publication dates may occasionally vary without notice.

#### BOOK COVERS

Please note where a current edition cover is not available at the time of printing, a generic image is used.

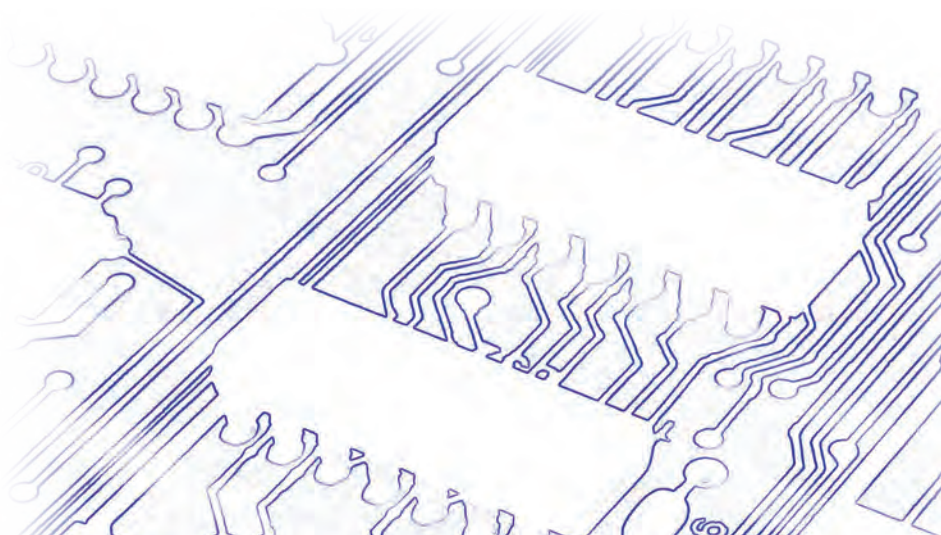
#### PRICES

Prices in this catalogue are shown in Dollars, Sterling, and Euros. For Middle East and Africa prices, please contact your Sales Representative.

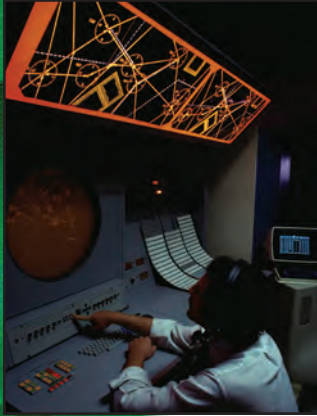
# ENGINEERING TEXTBOOKS

# 2011

<b>Aerospace Engineering</b> .....	4
<b>Biomedical Engineering</b> .....	7
<b>Chemical Engineering</b> .....	12
<b>Electrical Engineering</b> .....	14
<b>General Engineering</b> .....	16
<b>Materials Engineering</b> .....	21
<b>Mechanical Engineering</b> .....	25
<b>Customer Service Index</b> .....	30
<b>Further Information</b> .....	31







## Theory of Propulsion

### *Aerospace Engineering*

Edited By Pasquale M. Sforza

Readers of this book will be able to utilize the fundamental principles of fluid mechanics and thermodynamics to analyze aircraft engines. They will also understand the common gas turbine aircraft propulsions systems; be able to conceive, analyze, and optimize competing preliminary designs for missions, and more.

#### Table of Contents

1. Idealized Flow Machines; 2. Quasi-One-Dimensional Flow Equations; 3. Combustion Chambers for Airbreathing Engines; 4. Equilibrium Chemistry; 5. Nozzles; 6. Inlets; 7. Turbomachinery; 8. Cascades and Centrifugal Compressors; 9. Propellers; 10. Blade Element Theory for Axial Flow Compressors; 11. Turbojet Component Matching; 12. Compressibility Effects in Turbomachines; 13. Liquid Rockets; 14. Solid Propellant Rockets; 15. Nuclear Rockets; 16. Propulsion for High-Speed Flight; 17. Electric Propulsion;

#### Appendices

A. Gas Dynamics Tables; B. Thermodynamic Properties ASTM-A-1

■ Oct 2011 | Hardback | 624 pp. | \$119.95 | €79.95 | £49.99 | ISBN: 978-1-85617-912-6



## Flight Dynamics Principles, Second Edition

### *A Linear Systems Approach to Aircraft Stability and Control*

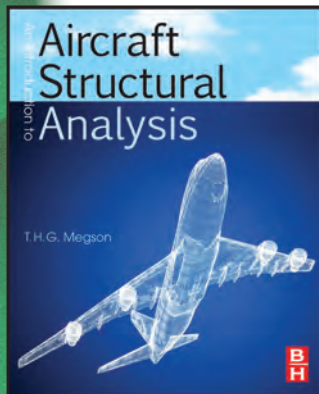
Michael V. Cook

This established text provides the most thorough introduction to the theoretical understanding of the stability and control of aircraft, flight control systems, and automatic control. This book is enhanced by worked examples, case studies, and accompanying aircraft operating condition software.

**Ancillaries:** Instructors Manual • Image Bank

■ Sep 2007 | Hardback | 488 pp. | \$87.95 | €58.95 | £53.99 | ISBN: 978-0-7506-6927-6





## Introduction to Aircraft Structural Analysis

T. H. G. Megson

Based on Megson's well-respected text in Aircraft Structures, this book covers the basics of structural analysis as applied to aircraft structures. Coverage of elasticity, energy methods, and virtual work set the stage for discussions of airworthiness/airframe loads and stress analysis of aircraft components. Worked examples, illustrations, and more are included.

### Table of Contents

#### Part A Fundamentals of Structural Analysis

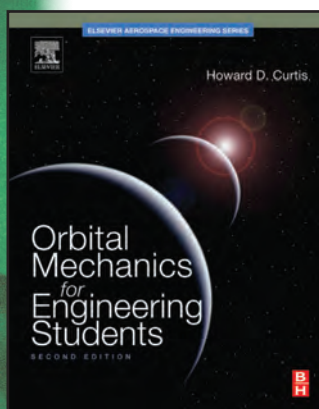
Basic Elasticity • 2D Problems in Elasticity • Torsion of Solid Sections • Virtual Work and Energy Methods • Energy Methods • Matrix Methods • Bending of Thin Plates • Columns • Thin Plates

#### Part B Analysis of Aircraft Structures

Materials • Structural Components of Aircraft • Airworthiness • Airframe Loads • Fatigue • Bending of Open, Closed, and Thin Walled Beams • Shear of Beams • Torsion of Beams • Combined Open and Closed Section Beams • Structural Idealization • Wing Spars and Box Beams • Fuselages • Wings • Fuselage Frames and Wing Ribs

**Ancillaries:** Solutions Manual • Image Bank

■ Feb 2010 | Paperback | 648 pp. | \$79.95 | €57.95 | £48.99 | ISBN: 978-1-85617-932-4



## Orbital Mechanics, Second Edition

Howard Curtis

This foundational book starts with the solution of the two-body problem and formulas for the different kinds of orbits and ends with basic rocket dynamics. Its approach emphasizes analytical procedures and computer-implemented algorithms. A large number of worked examples, illustrations, exercises, and MATLAB® programs are provided.

### Table of Contents

1. Dynamics of Point Masses; 2. The Two-Body Problem; 3. Orbital Position as a Function of Time; 4. Orbits in Three Dimensions; 5. Preliminary Orbit Determination; 6. Orbital Maneuvers; 7. Relative Motion and Rendezvous; 8. Interplanetary Trajectories; 9. Rigid-Body Dynamics; 10. Satellite Attitude Dynamics; 11. Rocket Vehicle Dynamics

#### Appendices

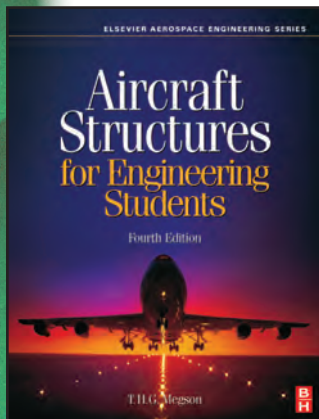
A: Physical Data; B: A Road Map; C: Numerical Integration of the n-Body Equations of Motion; D: MatLab Algorithms; E: Gravitational Potential Energy of a Sphere

**Ancillaries:** Lecture Slides • Solutions Manual • MATLAB Code

■ **Book** Oct 2009 | Hardback | 744 pp. | \$97.95 | €70.95 | £60.99 | ISBN: 978-0-12-374778-5

■ **Book + Online Testing** Oct 2009 | \$119.95 | €79.95 | £73.00 | ISBN: 978-1-85617-954-6





## Aircraft Structures for Engineering Students, Fourth Edition

T. H. G. Megson

This book is the leading self-contained aircraft structures course text. It covers all fundamental subjects, including elasticity, structural analysis, airworthiness, and aeroelasticity. This edition has been revised and updated throughout, including a new case study and worked example material. A solutions manual is available to all adopting teachers.

### Table of Contents

#### Part A Fundamentals of Structural Analysis

*A I Elasticity:* 1. Basic elasticity; 2. Two-dimensional problems in elasticity; 3. Torsion of solid sections • *A II Virtual Work, Energy and Matrix Methods:* 4. Virtual work; 5. Energy methods; 6. Matrix methods • *A III Thin Plate Theory:* 7. Bending of thin plates; • *A IV Structural Instability:* 8. Columns; 9. Thin plates; 10. Structural Vibration

#### Part B Analysis of Aircraft Structures

*B I Principles of Stressed Skin Construction:* 11. Materials; 12. Structural components of aircraft • *B II Airworthiness and Airframe Loads:* 13. Airworthiness; 14. Airframe loads; 15. Fatigue • *B III Bending, Shear and Torsion of Thin-Walled Beams:* 16. Bending of open and closed, Thin-Walled Beams; 17. Shear of beams; 18. Torsion of beams; 19. Combined open and closed section beams; 20. Structural Idealisation • *B IV Stress Analysis of Aircraft Components:* 21. Wing spars and box beams; 22. Fuselages; 23. Wings; 24. Fuselage frames and wing ribs; 25. Laminated composite structures • *B V Structural and Loading Discontinuities:* 26. Closed section beams; 27. Open section beams • *B VI Introduction to Aeroelasticity:* 28. Wing problems

#### Appendix

Case Study: Design of an Aircraft Fuselage

**Ancillaries:** Solutions Manual

■ Mar 2007 | Paperback | 824 pp. | \$99.95 | €66.95 | £60.99 | ISBN: 978-0-7506-6739-5





## Electric Circuits, Bioinstrumentation and Measurement for Biomedical Engineers

*An Introduction (with LabVIEW)*

John Enderle and Dennis Lovely

This textbook was written explicitly for students of biomedical and bioengineering taking courses in bioinstrumentation. It is supported throughout by LabVIEW-based exercises and projects. A comprehensive teaching package is also included with worked example problems, case studies, end of chapter problems, and a fully worked solutions manual.

### Table of Contents

1. Introduction and Basic Bioinstrumentation Systems and Design; 2. Sources and Resistance; 3. Linear Network Analysis; 4. Inductors and Capacitors; 5. General Approach to Solving Circuits Involving Resistors, Capacitors and Inductors; 6. Basics of Operational Amplifiers; 7. Laplace Transform; 8. Fourier Series and Fourier Transform; 9. Time-Varying Signals and basic measurement; 10. Active Analog High Order Filters; 11. Basic Noise Theory, probability and statistics; 12. Signal Processing; 13. Data Acquisition (LabView); 14. Biomedical Electrodes; 15. Biosensors and sensor principles for biomedical measurements; 16. Electrode Amplifier Design; 17. Coupling to the Environment; 18. Measurement of Temperature; 19. Measurement of Heart Rate and Pressure; 20. Measurement of Sounds, Electric Potentials and Magnetic Fields; 21. Measurements using Optics and Lasers (pulse-oximetry and others); 22. Automated Clinical Laboratory Techniques; 23. Medical Device Safety; 24. Calibration, Grounding Faults, FDA and ISO Standards and Quality Assurance; 25. Advanced Laboratories and exercises

■ Nov 2011 | Hardback | 480 pp. | \$99.95 | €71.95 | £60.99 | ISBN: 978-0-12-374744-0



## BioFluid Mechanics

*An Introduction to Fluid Mechanics, Macrocirculation, and Microcirculation Biomedical Engineering*

David Rubenstein, Wei Yin, and Mary Frame

This book shows that fluid mechanics principles can be applied not only to blood circulation, but also to air flow through the lungs, joint lubrication, intraocular fluid movement, and renal transport. Each section initiates discussion with governing equations, derives the state equations, and then shows examples of their usage.

■ Oct 2011 | Hardback | 624 pp. | \$119.95 | €58.95 | £49.99 | ISBN: 978-0-12-381383-1





## Circuits, Signals, and Systems for Bioengineers, Second Edition

*A MATLAB-Based Introduction*

**John Semmlow**

This book guides the reader through the electrical engineering principles that can be applied to biological systems and are important to biomedical studies. It explains in detail the basic engineering concepts that underlie biomedical systems, medical devices, biocontrol, and biosignal analysis. A companion CD includes questions and problems.

### Table of Contents

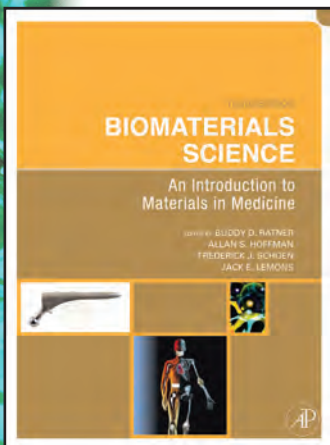
Introduction to Biological Systems and Biosignals; Basic Signal Processing; Frequency Transformations; Analog Analysis in Sinusoidal Steady State; Analysis of Analog Models and Processes; Transfer and Frequency Characteristics of Analog Models; Relationships in Analog Models; Analysis of Transient Conditions – The Laplace Transform; Systems Modeling and Behavior

### Appendices

A: Complex Numbers; B: Laplace Transforms; D: Conversion Factors

**Ancillaries:** MATLAB Examples and Problems • PowerPoint Presentations • Extra Examples • Figures • Support Routines

■ Oct 2011 | Hardback | 464 pp. | \$119.95 | €85.95 | £44.99 | ISBN: 978-0-12-384982-3



## Biomaterials Science, Third Edition

*An Introduction to Materials in Medicine*

**Buddy D. Ratner, Allan S. Hoffman, Frederick J. Schoen, and Jack E. Lemons**

The revised edition of this renowned title is the most comprehensive single text on all aspects of biomaterials science. It provides a balanced approach to learning the science and technology of biomaterials, and acts as a key reference for practitioners with involvement in the applications of materials in medicine.

### Table of Contents

How to Use This Book (*including teaching route maps and strategies*)

#### PART I: Materials Science & Engineering

Properties of Materials; Classes of Materials Used in Medicine

#### PART II: Biology and Medicine

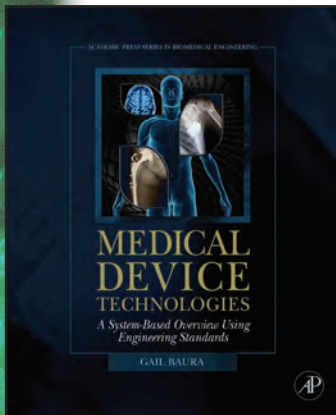
Cell and Tissue Concepts; Host Reactions to Biomaterials and Their Evaluation; Biological Testing Biomaterials; Degradation of Materials in the Biological Environment; Applications of Biomaterials in Medicine; Applications of Biomaterials in Functional Tissue Engineering

#### PART III: Practical Aspects of Biomaterials

Implants, Devices and Biomaterials; Products and Standards; Perspectives and Possibilities in Biomaterials Science

**Ancillaries:** Instructor's Manual • Assignments and Case Studies • Biomaterials Test-Bank • PowerPoint Image Bank • Video and PowerPoint Teaching Resources

■ Jul 2011 | Hardback | 1,056 pp. | \$99.95 | €58.95 | £49.99 | ISBN: 978-0-12-374626-9



## Medical Device Technologies

### *A Systems Based Overview Using Engineering Standards*

Gail Baura

First course text for biomedical/medical devices or instrumentation in biomedical engineering and bioengineering programs, taught at Junior and Senior undergrad level and graduate level.

This text for biomedical/medical devices or instrumentation in biomedical engineering and bioengineering programs, builds a systems-based knowledge of core medical technology. It focuses on the equipment found in such growth areas as cardiovascular, neural, orthopedic, and combination products. Twenty devices are covered from the standard to the more exotic.

#### Table of Contents

**Pt 1: Devices;** Introduction to Diagnosis and Therapy Devices; Electrocardiographs; Pacemakers; External Defibrillators; Internal Cardioverter Defibrillators; Heart Valves; Catheters, Stents and Grafts; Blood Pressure Monitors; Hemodialyzers; Ventilators; Pulse Oximeters; Thermometers; Electroencephalographs; Neurostimulators; Cochlear Implants; Functional Electrical Stimulators; Hip and Knee Prosthesis; Drug-Eluting Stents; Artificial Pancreas; **Part 2: Laboratory Experiments**

■ May 2011 | Hardback | 480 pp. | \$119.95 | €70.95 | £59.00 | ISBN: 978-0-12-374976-5



## Introduction to Biomedical Engineering, Third Edition

John Enderle and Joseph Bronzino

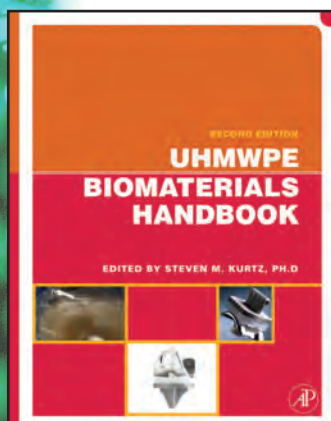
This comprehensive text for biomedical engineering courses is the most widely adopted text across the BME course spectrum. Biomedical engineers need to understand a wide range of topics, which are covered in detail in this text, including new chapters on hot topics such as tissue engineering, enhanced pedagogy, and features.

#### Table of Contents

Overview of BME; Moral and Ethical Issues; Anatomy and Physiology; Biomechanics; Biomaterials; Tissue Engineering; Biochemical Engineering; Bioinstrumentation; Biosensors; Biosignal Processing; Bioelectric Phenomena; Compartmental Analysis; Basic Transport Phenomena; Physiological Modeling; Organ Systems; Radiation Imaging; Medical Imaging; Biomedical Optics and Lasers; Appendices: MatLab and Simulink Tutorials

**Ancillaries:** Solutions Manual • Color PPT Slides

■ Mar 2011 | Hardback | 1,280 pp. | \$129.95 | €58.95 | £49.99 | ISBN: 978-0-12-374979-6



## UHMWPE Biomaterials Handbook, Second Edition

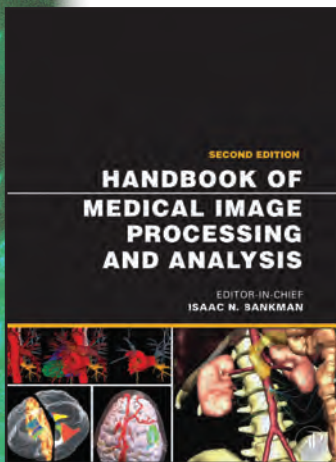
### *Ultra High Molecular Weight Polyethylene in Total Joint Replacement and Medical Devices*

Steven M. Kurtz

"[This book] is a comprehensive yet concise presentation of the important role that polyethylene has played and continues to play in the treatment armamentarium of the orthopedic surgeon." (Joshua Jacobs, MD) It describes the science, development, properties, and application of ultra-high molecular weight polyethylene (UHMWPE) used in artificial joints.

■ Jun 2009 | Hardback | 568 pp. | \$185.00 | €133.00 | £120.00 | ISBN: 978-0-12-374721-1





## Handbook of Medical Image Processing and Analysis, Second Edition

Isaac Bankman

This book is the comprehensive single-volume reference for those working in medical imaging and medical image processing. This edition includes 35 updated and five new chapters covering the latest technology and research, and features contributions from internationally renowned authors at leading institutions.

### Table of Contents

Introduction; 1. Fundamental Enhancement Techniques; 2. Adaptive Image Filtering; 3. Enhancement by Multiscale Nonlinear Operators; 4. Medical Image Enhancement with Hybrid Filters

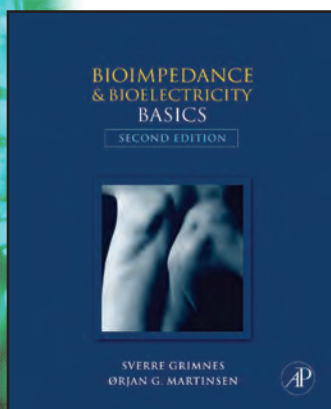
### SEGMENTATION

Introduction; 5. Overview and Fundamentals of Medical Image Segmentation; 6. Image Segmentation by Fuzzy Clustering: Methods and Issues; 7. Segmentation with Neural Networks; 8. Deformable Models; 9. Shape Information in Deformable Models; 10. Gradient Vector Flow Deformable Models; 11. Fully Automated Hybrid Segmentation of the Brain; 12. Unsupervised Tissue Classification; 13. Partial Volume Segmentation with Voxel Histograms; 14. Higher Order Statistics for Tissue Segmentation

### QUANTIFICATION

Introduction; 15. Two-dimensional Shape and Texture Quantification; 16. Texture Analysis in Three Dimensions for Tissue Characterization; 17. Computational Neuroanatomy Using Shape Transformations; 18. Tumor Growth Modeling in Oncological Image Analysis; 19. Arterial Tree Morphometry; 20. Image-Based Computational Biomechanics of the Musculoskeletal System; 21. Three-Dimensional Bone Angle Quantification; 22. Database Selection and Feature Extraction for Neural Networks; 23. Quantitative Image Analysis for Estimation of Breast Cancer Risk; 24. Classification of Breast Lesions in Mammograms; 25. Quantitative Analysis of Cardiac Function; 26. Image Processing and Analysis in Tagged Cardiac MRI; 27. Analysis of Cell Nuclear Features in Fluorescence Microscopy Images; 28. Image Interpolation and Resampling

■ Dec 2008 | Hardback | 1,000 pp. | \$175.00 | €117.00 | £110.00 | ISBN: 978-0-12-373904-9



## Bioimpedance and Bioelectricity Basics, Second Edition

Orjan G. Martinsen and Sverre Grimnes

This book is a complete introduction to the use and effects of electrical fields in tissue. It presents the electrical engineering concepts of network theory and develops the appropriate supporting mathematics. This edition emphasizes bioelectricity and includes a new chapter on excitable tissue electrical properties.

### Table of Contents

Introduction; Electrolytics; Dielectrics; Passive Tissue Electrical Properties; Excitable Tissue Electrical Properties; Geometrical Analysis; Instrumentation and Measurement; Data and Models; Selected Applications; History of Bioimpedance and Bioelectricity; Appendix

**Ancillaries:** Solutions Manual

■ Apr 2008 | Hardback | 488 pp. | \$125.00 | €83.95 | £76.00 | ISBN: 978-0-12-374004-5



## Tissue Engineering

Edited By Clemens van Blitterswijk

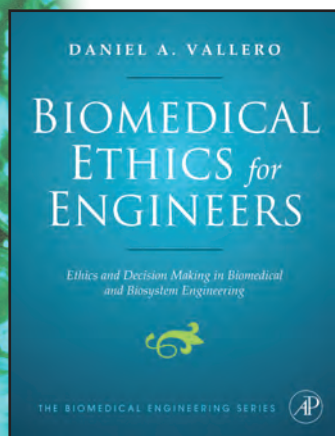
*Tissue Engineering* is a comprehensive introduction to the engineering and biological aspects of this critical subject. Key topics covered include stem cells; morphogenesis and cellular signaling; the extracellular matrix; biocompatibility; scaffold design and fabrication; controlled release strategies; bioreactors; tissue engineering of skin, cartilage, bone, and organ systems; and ethical issues.

### Table of Contents

Stem Cells; Morphogenesis, Generation of Tissue in the Embryo; Tissue Homeostasis; Cellular Signaling; The Extracellular Matrix as a Biologic Scaffold for Tissue Engineering; Natural Polymers in Tissue Engineering Applications; Degradable Polymers for Tissue Engineering; Degradation of Bioceramics; Biocompatibility; Cell Source; Cell Culture: Harvesting, Selection, Expansion, and Differentiation; Cell Nutrition; Cryobiology; Scaffold Design and Fabrication; Controlled Release Strategies in Tissue Engineering; Bioreactors for Tissue Engineering; Tissue Engineering for Skin Transplantation; Tissue Engineering of Cartilage; Tissue Engineering of Bone; Tissue Engineering of the Nervous System; Tissue Engineering of Organ Systems; Ethical Issues in Tissue Engineering

**Ancillaries:** Image Bank

■ Mar 2008 | Hardback | 760 pp. | \$115.00 | €76.95 | £69.99 | ISBN: 978-0-12-370869-4



## Biomedical Ethics for Engineers

*Ethics and Decision Making in Biomedical and Biosystem Engineering*

Edited By Daniel Vallero

This book provides biomedical students with a new set of tools and an understanding that there is seldom consensus on the application of ethical measures even among engineers and scientists. It also discusses the full suite of emerging biomedical and environmental issues to be addressed within a global and societal context.

### Table of Contents

Preface; Prologue; 1. Bioethics: A Creative Approach; 2. Bioethics and the Engineer; 3. An Engineered Future: Human Enhancement; 4. The Bioethical Engineer; 5. Bioethical Research and Technological Development; 6. Safety, Risk and Reliability as Measures of Bioethics; 7. Bioethical Success and Failure; 8. Justice and Fairness as Engineering Concepts; 9. Sustainable Bioethics; 10. Engineering Wisdom; Epilogue: Practical Bioethics

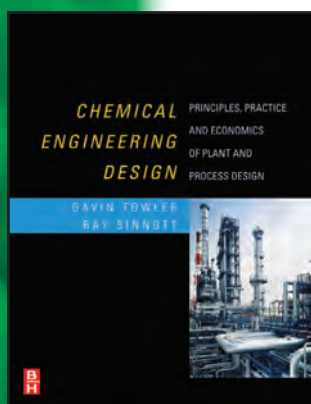
### Appendices

1. National Society of Professional Engineers - Code of Ethics for Engineers;
2. Biomedical Engineering Society Code of Ethics

**Ancillaries:** Bioethics Resources for the Engineer • Suggested Readings • Useful Websites

■ Mar 2007 | Hardback | 408 pp. | \$55.95 | €37.95 | £33.99 | ISBN: 978-0-7506-8227-5





## Chemical Engineering Design

*Principles, Practice and Economics of Plant and Process Design*

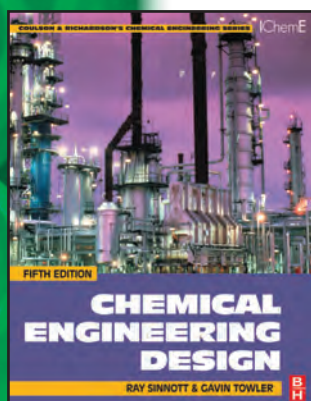
Gavin Towler and R. K. Sinnott

One of the most widely adopted texts available for chemical engineering students, it deals with the application of chemical engineering principles to the design of chemical processes and equipment. This edition is revised throughout, covering the latest aspects of process design, operations, safety, loss prevention, equipment selection, and more.

### Table of Contents

Introduction to Design; Fundamentals of Material Balances; Fundamentals of Energy Balances (and Energy Utilization); Flow-Sheeting; Piping and Instrumentation; Costing and Project Evaluation; Materials of Construction; Design Information and Data; Safety and Loss Prevention; Equipment Selection, Specification and Design; Separation Columns (Distillation, Absorption and Extraction); Heat-Transfer Equipment; Mechanical Design of Process Equipment; General Site Considerations; Appendices; Indices

■ Nov 2007 | Hardback | 1,266 pp. | \$93.95 | €62.95 | £56.99 | ISBN: 978-0-7506-8423-1



## Chemical Engineering Design, Fifth Edition

*SI Edition*

Gavin Towler and R. K. Sinnott

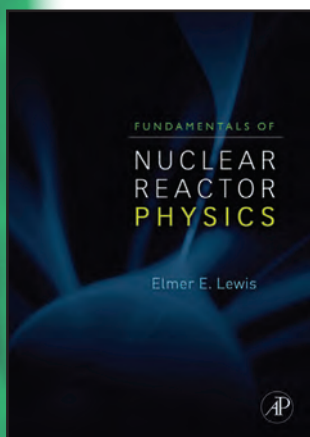
*Chemical Engineering Design* is one of the best-known and most widely adopted texts available for students of chemical engineering. It completely covers the standard chemical engineering final year design course, and is widely used as a graduate text. The hallmarks of this renowned book have always been its scope, practical emphasis, and closeness to the curriculum. That it is written by practicing chemical engineers makes it particularly popular with students who appreciate its relevance and clarity. Building on this position of strength, the fifth edition covers the latest aspects of process design, operations, safety, loss prevention and equipment selection, and much more. Comprehensive in coverage, exhaustive in detail, supported by extensive problem sets at the end of each chapter, a fully worked solutions manual and a suite of valuable software tools, this is a book that students will want to keep to hand as they enter their professional life.

### Table of Contents

Introduction to Design; Fundamentals of Material Balances; Fundamentals of Energy Balances (and Energy Utilization); Flow-Sheeting; Piping and Instrumentation; Costing and Project Evaluation; Materials of Construction; Design Information and Data; Safety and Loss Prevention; Equipment Selection, Specification and Design; Separation Columns (Distillation, Absorption and Extraction); Heat-Transfer Equipment; Mechanical Design of Process Equipment; General Site Considerations; Appendices; Full Solutions Manual Online; Accompanying Design and Flow-Sheeting Software Tools, Plus Costing Templates and Data Sources for Downloading; Complete Set of Figures in PowerPoint Format for Lecture Slide Download by Instructors

**Ancillaries:** Solutions Manual • PowerPoint Slides

■ Jul 2009 | Hardback | 1,038 pp. | \$79.95 | €57.95 | £49.99 | ISBN: 978-0-7506-8551-1



## Fundamentals of Nuclear Reactor Physics

Elmer E. Lewis

This book offers an engineering-oriented introduction to nuclear physics, with a focus on how physics work in the service of generating nuclear-based power, particularly the importance of neutron reactions and neutron behavior. This applications-oriented approach, with many worked-out examples, provides a valuable resource to aspiring nuclear engineers.

### Table of Contents

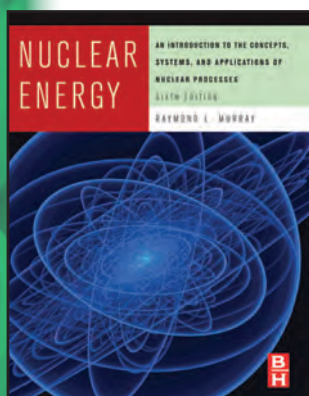
1. Nuclear Reactions; 2. Neutron Interactions; 3. Neutron Distributions in Energy;
4. The Power Reactor Core; 5. Reactor Kinetics; 6. Spatial Diffusion of Neutrons;
7. Neutron Distributions in Reactors; 8. Energy Transport; 9. Reactivity Feedback;
10. Long Term Core Behavior

### Appendices

A: Useful Mathematics; B: Bessel's Equation and Functions; C: Derivation of Neutron Diffusion Properties; D: Fuel Element Heat Transfer; E: Nuclear Data

**Ancillaries:** Solutions Manual

■ Jan 2008 | Hardback | 280 pp. | \$104.00 | €69.95 | £63.99 | ISBN: 978-0-12-370631-7



## Nuclear Energy, Sixth Edition

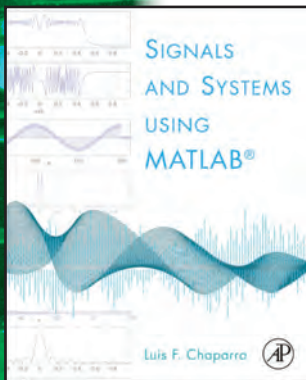
*An Introduction to the Concepts, Systems, and Applications of Nuclear Processes*

Raymond L. Murray

*Nuclear Energy* is one of the most popular texts ever published on basic nuclear physics, systems, and applications of nuclear energy. This accessible edition offers undergraduates a comprehensive overview of radioactivity, radiation protection, nuclear reactors, waste disposal, and nuclear medicine

■ Nov 2008 | Hardback | 552 pp. | \$89.95 | €59.95 | £54.99 | ISBN: 978-0-12-370547-1





## Signals and Systems Using MATLAB

Luis Chaparro

This new text in signals and systems provides a pedagogically rich approach to an often dry subject. With features like historical notes, highlighted common mistakes, and applications in controls, communications, and signal processing, students will appreciate the useful techniques described in the book. Each chapter contains MATLAB applications.

### Table of Contents

From the Ground Up; Continuous-time Signals; Continuous-time Systems; The Laplace Transform; Frequency Analysis: The Fourier Series; Frequency Analysis: The Fourier Transform; Application to Control and Communications; Sampling Theory; Discrete-time Signals and Systems; The Z-transform; Fourier Representation of Discrete-time Signals and Systems; Introduction to Discrete Filtering; Applications of Discrete-time Signals and Systems; Appendix A: Useful Formulas

**Ancillaries:** Solutions Manual • Image Bank • Lecture Slides • MatLab Code • Elsevier Online Testing

■ **Book Sep 2010** | Hardback | 768 pp. | \$99.95 | €58.95 | £49.99 | ISBN: 978-0-12-374716-7

■ **Book + Online Testing** \$119.95 | €68.95 | £59.99 | ISBN: 978-0-12-385108-6

■ **Signals and Systems Online Testing Registration Card:**

\$39.95 | €28.95 | £24.99 | ISBN: 978-0-12-384949-6



## Pattern Recognition, Fourth Edition

Sergios Theodoridis and Konstantinos Koutroumbas

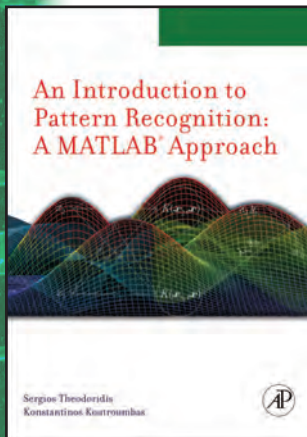
This book considers classical and current theory and practice, of supervised, unsupervised and semi-supervised pattern recognition, to build a complete background for professionals and students of engineering. The very latest methods are incorporated in this edition: semi-supervised learning, combining clustering algorithms, and relevance feedback.

### Table of Contents

1. Introduction; 2. Classifiers based on Bayes Decision; 3. Linear Classifiers; 4. Nonlinear Classifiers; 5. Feature Selection; 6. Feature Generation I: Data Transformation and Dimensionality Reduction; 7. Feature Generation II; 8. Template Matching; 9. Context Dependant Clarification; 10. System Evaluation; 11. Clustering: Basic Concepts; 12. Clustering Algorithms I: Algorithms I Sequential; 13. Clustering Algorithms II: Hierarchical; 14. Clustering Algorithms III: Based on Function Optimization; 15. Clustering Algorithms IV: Clustering; 16. Cluster Validity

**Ancillaries:** An accompanying book with MatLab code of the most common methods and algorithms in the book, together with a descriptive summary, and solved examples including real-life data sets in imaging and audio recognition. The companion book will be available separately or at a special packaged price (ISBN: 978-0-12-374486-9)

■ **Oct 2008** | Hardback | 984 pp. | \$99.95 | €66.95 | £60.99 | ISBN: 978-1-59749-272-0



## Introduction to Pattern Recognition: A MatLab Approach

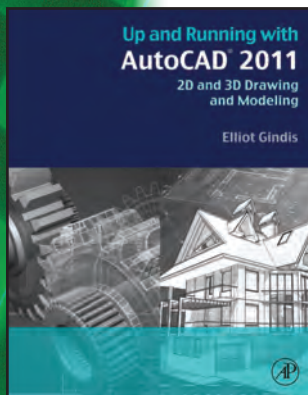
*Pattern Recognition & MatLab Intro*

Sergios Theodoridis, Aggelos Pikrakis, Konstantinos Koutroumbas, and  
Dionisis Cavouras

This companion manual to Theodoridis/Koutroumbas *Pattern Recognition* includes Matlab code of the most common methods and algorithms in the book, together with a descriptive summary and solved examples, and including real-life data sets in imaging and audio recognition.

■ Mar 2010 | Paperback | 231 pp. | \$39.95 | €28.95 | £24.99 | ISBN: 978-0-12-374486-9





## Up and Running with AutoCAD 2011

### 2D and 3D Drawing and Modeling

Elliot Gindis

This guide offers step-by-step instruction, examples, and insightful explanations with an emphasis on core concepts and practical application of AutoCAD in architecture, engineering, and design. Equally useful in instructor-led classroom training or self-study, the book is based on what really works in the industry and classroom.

#### Table of Contents

##### Part I: Beginner to Intermediate

1. AutoCAD Fundamentals 1; 2. AutoCAD Fundamentals 2; 3. Layers, Colors, Linetypes and Properties; 4. DText, MText, Style and Editing; 5. B hatch; 6. Dimensions; 7. Blocks and Wblocks; 8. Polar and Rectangular Arrays, Polygon and Circle/TTR; 9. Isometric; 10. Basic Printing and Output

##### Part II: Intermediate to Advanced

11. Advanced Linework; 12. Advanced Layers; 13. Advanced Dimensions; 14. Options, Shortcuts, CUI, Design Center & Exp. Tools; 15. Miscellaneous Topics; 16. Importing and Exporting Data; 17. External References; 18. Paper Space; 19. Attributes; 20. Advanced Output and Pen Settings

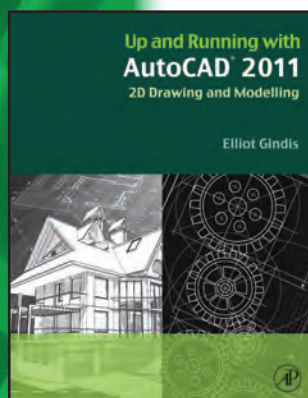
##### Part III: 3D

21. 3D Basics; 22. Primitives; 23. Object Manipulation; 24. Boolean Operations; 25. Advanced 3D Tools I; 26. Advanced 3D Tools II; 27. Meshes and Surfaces; 28. UCS, Vports, Text and Dims in 3D; 29. Cameras, Walk and Fly; 30. Lighting and Rendering; Appendices

**Ancillaries:** Downloadable CAD Files

■ Aug 2010 | Paperback | 708 pp. | \$79.95 | €57.95 | £48.99 | ISBN: 978-0-12-375717-3

**AutoCAD 2012**  
Publishing in June 2011



## Up and Running with AutoCAD 2011

### 2D Drawing and Modeling

Elliot Gindis

This practical guide strips away the complexity and presents AutoCAD with accessible, basic concepts. It explains the theory behind each concept and command, and documents all the basic commands step-by-step. Extensive supporting graphics and a summary with a self-test section and topic specific drawing exercises are included.

#### Table of Contents

##### Part I: Beginner to Intermediate

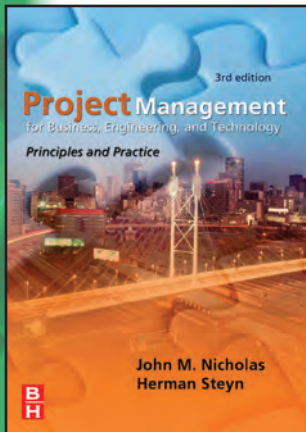
1. AutoCAD Fundamentals 1; 2. AutoCAD Fundamentals 2; 3. Layers, Colors, Linetypes and Properties; 4. DText, MText, Style and Editing; 5. B hatch; 6. Dimensions; 7. Blocks and Wblocks; 8. Polar and Rectangular Arrays, Polygon and Circle/TTR; 9. Isometric; 10. Basic Printing and Output

##### Part II: Intermediate to Advanced

11. Advanced Linework; 12. Advanced Layers; 13. Advanced Dimensions; 14. Options, Shortcuts, CUI, Design Center & Exp. Tools; 15. Miscellaneous Topics; 16. Importing and Exporting Data; 17. External References; 18. Paper Space; 19. Attributes; 20. Advanced Output and Pen Settings

**Ancillaries:** Downloadable CAD Files

■ Aug 2010 | Paperback | 510 pp. | \$59.95 | €42.95 | £36.99 | ISBN: 978-0-12-375715-9



## Project Management for Engineering, Business, and Technology, Fourth Edition

**NEW EDITION**

John M. Nicholas and Herman Steyn

After covering essential project management background, from origins to methodology, this book is dedicated to the concepts and techniques of practical application, including project initiation and proposals, scope and task definition, scheduling, budgeting, risk analysis, control, project organization, and critical 'people' aspects—project leadership, team building, and conflict resolution.

### Table of Contents

#### Part I: Philosophy and Concepts

1. What Is Project Management?; 2. Systems Approach and Systems Engineering

#### Part II: Systems Development Cycle

3. Systems Development Cycle and Project Conception; 4. Project and System Definition

#### Part III: Systems and Procedures

5. Planning Fundamentals; 6. Project Time Planning and Networks; 7. Advanced Network Analyses and Scheduling; 8. Cost Estimating and Budgeting; 9. Project Quality Management; 10. Managing Risks in Projects; 11. Project Execution and Control; 12. Project Evaluation, Communication, Implementation, and Closeout

#### Part IV: Organization Behavior

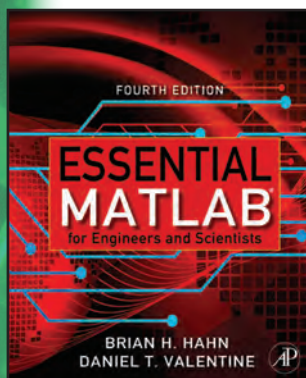
13. Project Organization Structure and Integration; 14. Project Roles, Responsibility, and Authority; 15. Managing Participation, Teamwork, and Conflict

#### Part V: Project Management in the Corporate Context

16. The Management of Project Management; 17. Project Selection and Portfolio Management; 18. International Project Management

**Ancillaries:** Extensive instructor support materials, including a test bank of questions and answers, PowerPoint slides, case studies and links to further reading

■ Nov 2011 | Paperback | 752 pp. | \$79.95 | €52.95 | £44.99 | ISBN: 978-0-08-096704-2



## Essential MATLAB for Engineers and Scientists, Fourth Edition

Brian Hahn and Dan Valentine

This text presents MATLAB both as a mathematical tool and a programming language, giving a concise and easy to master introduction to its potential and power. The new edition has been updated to include coverage of Symbolic Math and SIMULINK. It also adds new examples and applications.

### Table of Contents

#### Part I: Essentials

1. Introduction; 2. MATLAB Fundamentals; 3. Program Design and Algorithm Development; 4. MATLAB Functions Data Import–Export Utilities; 5. Logical Vectors; 6. Matrices of Numbers Arrays of Strings; 7. Introduction to Graphics; 8. Loops; 9. Errors and Pitfalls; 10. Function M-Files; 11. Vectors as Arrays: Advanced Data Structures; 12. More Graphics; 13. Graphical User Interfaces (GUIs);

#### Part II: Applications

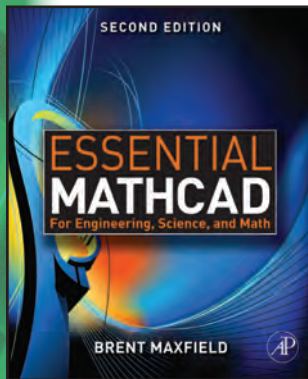
14. Dynamics Systems; 15. Simulation; 16. More Matrices; 17. Introduction to Numerical Methods; 18. Toolboxes that Come with MATLAB (Web Chapter)

Appendices

**Ancillaries:** Solutions Manual • Image Bank • End of Chapter Assignments & Quiz Questions • Lecture Slides • MATLAB Files

■ Oct 2009 | Paperback | 398 pp. | \$49.95 | €35.95 | £30.99 | ISBN: 978-0-12-374883-6





## Essential Mathcad for Engineering, Science, and Math ISE, Second Edition

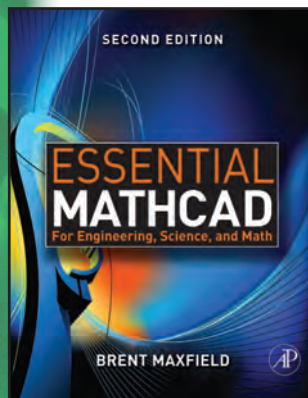
Brent Maxfield

This edition offers a step-by-step approach to more applied examples and exercises from a wide variety of engineering, science, and math fields. With more thorough discussions of differential equations, 3D plotting, and curve fitting, this book presents frequently used tools in a style that is both more detailed and accessible.

### Table of Contents

Introduction; Variables; Creating and Editing Mathcad Expressions; Simple User-Defined Functions; Units!; Mathcad Settings; Customizing Mathcad; Templates; Arrays, Vectors, and Matrices; Selected Mathcad Functions; Plotting; Simple Logic Programming; Introduction to Symbolic Calculations; Solving Engineering Equations; Advanced Programming; Putting It All Together; Assembling Calculations from Standard Calculation Worksheets; Importing Files from Other Programs into Mathcad; Communicating with Other Programs Using Components; Microsoft Excel Component; Inputs and Outputs; Hyperlinks and Tables of Contents; Conclusion

■ Aug 2009 | Paperback | 528 pp. | \$49.95 | €35.95 | £30.99 | ISBN: 978-0-12-374846-1



## Essential Mathcad for Engineering, Science, and Math w/ CD, Second Edition

*Maxfield: Essential Mathcad CD*

Brent Maxfield

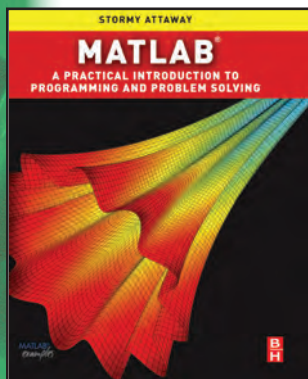
Features in this edition include a new first chapter introducing Mathcad basics, applied examples, and problems from a variety of disciplines, and thorough discussions of commonly used engineering tools—differential equations, 3D plotting, and curve fitting. Mathcad is also free with the text (North America only).

### Table of Contents

Introduction; Variables; Creating and Editing Mathcad Expressions; Simple User-Defined Functions; Units!; Mathcad Settings; Customizing Mathcad; Templates; Arrays, Vectors, and Matrices; Selected Mathcad Functions; Plotting; Simple Logic Programming; Introduction to Symbolic Calculations; Solving Engineering Equations; Advanced Programming; Putting It All Together; Assembling Calculations from Standard Calculation Worksheets; Importing Files from Other Programs into Mathcad; Communicating with Other Programs Using Components; Microsoft Excel Component; Inputs and Outputs; Hyperlinks and Tables of Contents; Conclusion

**Ancillaries:** Full non-expiring version of Mathcad 14 offered FREE with the text (North America only). The included software is for education purposes only.

■ May 2009 | Paperback | 528 pp. | \$49.95 | €35.95 | £30.99 | ISBN: 978-0-12-374783-9



## MATLAB: A Practical Introduction to Programming and Problem Solving, Second Edition

**NEW EDITION**

Stormy Attaway

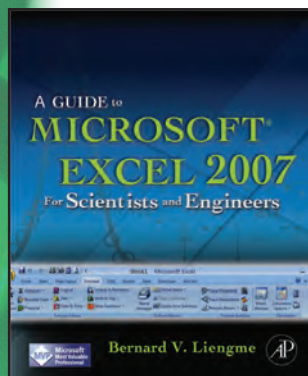
MATLAB is now pervasive as the software tool for solving scientific and engineering problems using both its powerful built-in functions and its ability to program. Assuming no prior knowledge, this book presents both programming concepts and MATLAB's built-in functions, providing a perfect platform for exploiting MATLAB's capabilities.

### Table of Contents

Introduction to MATLAB; MATLAB programs; Selection Statements; Looping; Introduction to User-defined Functions; String Manipulation; Data Structures; File Input/Output; Advanced Functions; MATLAB Plots; Matrix Operations; Solving Systems of Linear Algebraic Equations; Symbolic Mathematics; Statistics; Curve fitting; Sight and Sounds

**Ancillaries:** Solutions Manual • MATLAB files • PowerPoint Images from Text

■ Sep 2011 | Paperback | 480 pp. | \$49.95 | €35.95 | £30.99 | ISBN: 978-0-12-385081-2



## A Guide to Microsoft Excel 2007 for Scientists and Engineers

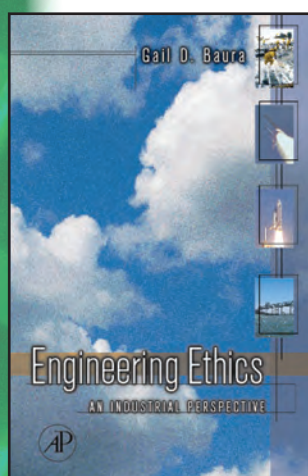
Bernard Liengme

Microsoft Excel has a range of scientific and engineering functions that can be used for modeling, analysis, and presentation of technical problems. This text provides a practical guide to using these functions to their full potential, from basic principles to more complicated areas such as charts and equation solving.

### Table of Contents

1. The Microsoft Excel Window; 2. Basic Operations; 3. Printing a Worksheet; 4. Using Functions; 5. Decision Functions; 6. Charts; 7. Curve Fitting; 8. User-defined Functions; 9. Modelling I; 10. Solving Equations; 11. Numerical Integration; 12. Differential Equations; 13. Modelling II; 14. Statistics for Experimenters; 15. Report Writing

■ Nov 2008 | Paperback | 336 pp. | \$39.95 | €26.95 | £24.99 | ISBN: 978-0-12-374623-8



## Engineering Ethics *An Industrial Perspective*

Gail Baura

Beginning with a concise overview of various approaches to engineering ethics, the heart of the book is 13 detailed case studies that give the history, official outcome, and 'real story' behind each one. They clearly illustrate the ethics issues at play and what should or should not have been done.

### Table of Contents

#### Part I: An Ethics Foundation

1. A Personal Engineering Ethics Threshold; 2. Options for Action When an Engineering Ethics Threshold is Reached

#### Part II: National Case Studies

3. 1978 – Ford Pinto Explosion; 4. 1981 – Kansas City Hyatt Regency Skywalk Collapse; 5. 1986 – Challenger Space Shuttle Explosion; 6. 1989 – Exxon Valdez Oil Spill; 7. 1989 – San Francisco-Oakland Bay Bridge Earthquake Collapse; 8. 1994 – Bjork Shiley Heart Valve Defect; 9. 1999 – Y2K Software Conversion; 10. 2002 – Bell Laboratories Scientific Fraud; 11. 2002 – Ford Explorer Rollover; 12. 2003 – Columbia Space Shuttle Explosion; 13. 2003 – Guidant Ancure Endograft System; 14. 2003 – Northeast Blackout; 15. 2004 – Indian Ocean Tsunami

Part III: Individual Case Studies 16. Anonymous Industrial Engineering Ethics Cases

■ Apr 2006 | Hardback | 256 pp. | \$48.95 | €32.95 | £29.99 | ISBN: 978-0-12-088531-2





## Exploring Engineering, Second Edition

*An Introduction to Engineering and Design*

Philip Kosky, Robert T. Balmer, William D. Keat, and George Wise

The first edition won *Best New Undergraduate Textbook* by the Professional and Scholarly Publishing Division of the American Association of Publishers (AAP). It is also the first text offering an introduction to the major engineering fields, and the engineering design process, with an interdisciplinary case study approach.

### Table of Contents

#### Part I: Minds-on

1. What Engineers Do; 2. Key Elements of Engineering Analysis; 3. How to solve problems and spreadsheet analyses; 4. Energy: Kinds, Conversion, and Conservation; 5. Chemical Energy of Fuels; 6. Powering the Future; 7. Electrical Circuits; 8. Logic and Computers; 9. Control Systems Design and Mechatronics; 10. Kinematics of Motion; 11. Materials Engineering; 12. Bioengineering; 13. Chemical Engineering; 14. Manufacturing

#### Part II: Hands-on

15. Introduction to Engineering Design; 16. Two Ground Rules for Design; 17. Clarification of the Task; 18. Generation of Alternative Concepts; 19. Evaluation of Alternatives and Selection of a Concept; 20. Detailed Design; 21. Oral Design Defense; 22. Manufacturing and Testing; 23. Performance Evaluation; 24. Design Report; 25. An Example of a Design Competition: 'A Bridge Too Far'; 26. Closing Remarks on the Important Role of Design Projects

**Ancillaries:** Solutions Manual • Instructors Aids – Sketches and Course Evaluation • Design Contests • Image Bank • Lecture Slides

■ Oct 2009 | Hardback | 464 pp. | \$89.95 | €65.95 | £56.99 | ISBN: 978-0-12-374723-5



## Technology Entrepreneurship

*Creating, Capturing, and Protecting Value*

Thomas N. Duening, Robert A. Hisrich, and Michael A. Lechter

This book offers rich case studies of entrepreneurship, focusing on the challenges of launching and operating a technology venture. It provides in-depth examinations of intellectual property development and management as well as valuation, deal structuring, and equity preservation. Extensive discussions of technology management, leadership, marketing and sales are included.

### Table of Contents

#### Part I: Business & Economics: A Crash Course

1. Fundamentals of Business; 2. Fundamentals of Economics; 3. Technology Entrepreneurship in the Global Economy

#### Part II: Legal Structure and Capital

4. Legal Structure and Equity Distribution; 5. Raising Capital & Deal Structuring; 6. Exit Strategies & Return on Investment

#### Part III: Intellectual Property and Contracts

7. Intellectual Property Management & Protection; 8. Contracts; 9. Negotiating Contracts

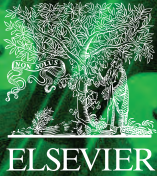
#### Part IV: Technology Venture Strategy and Operations

10. Launching Technology Ventures; 11. Going to Market and Distribution Strategies; 12. Financial Management & Control; 13. Venture Management & Leadership

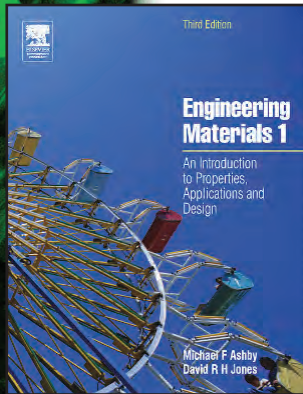
#### Part V: Managing Risk and Career Development

14. Venture Risk Management; 15. Managing Your Entrepreneurial Career

■ Sep 2008 | Hardback | 590 pp. | \$94.95 | €63.95 | £57.99 | ISBN: 978-0-12-374502-6



# MATERIALS ENGINEERING



## Engineering Materials 1, Fourth Edition

*An Introduction to Properties, Applications and Design*

**NEW EDITION**

Michael F. Ashby and D. R. H. Jones

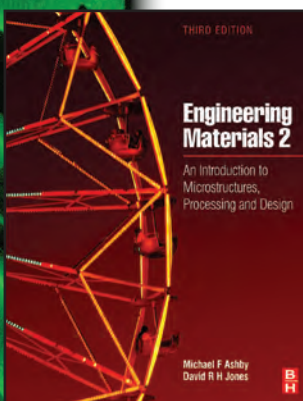
Widely adopted around the world, this is a core materials science and mechanical engineering text that gives a broad introduction to the properties of materials used in engineering applications. This edition features new online resources: a fully worked solutions manual, image bank, and tutorials.

### Table of Contents

Engineering Materials and Their Properties; Price and Availability of Materials; Elastic Moduli; Bonding Between Atoms; Packing of Atoms in Solids; Physical Basis of Young's Modulus; Case Studies in Modulus-Limited Design; Yield Strength, Tensile Strength and Ductility; Dislocations and Yielding in Crystals; Strengthening Methods and Plasticity of Polycrystals; Continuum Aspects of Plastic Flow; Case Studies in Yield-Limited Design; Fast Fracture and Toughness; Micromechanisms of Fast Fracture; Case Studies in Fast Fracture; Probabilistic Fracture of Brittle Materials; Fatigue Failure; Fatigue Design; Case Studies in Fatigue Failure; Creep and Creep Fracture; Kinetic Theory of Diffusion; Mechanisms of Creep and Creep-Resistant Materials; The Turbine Blade – Case Studies in Creep-Limited Design; Oxidation and Corrosion; Oxidation of Materials; Case Studies in Dry Oxidation; Wet Corrosion of Materials; Case Studies in Wet Corrosion; Friction and Wear; Case Studies in Friction and Wear; Design with Materials; Final Case Study – Materials and Energy in Car Design; Appendices – Symbols and Formulae; References; Index

**Ancillaries:** Solutions Manual • Online Tutorial Material

■ Sep 2011 | Paperback | 448 pp. | \$69.95 | €43.95 | £36.99 | ISBN: 978-0-08-096665-6



## Engineering Materials 2, Fourth Edition

*An Introduction to Microstructures, Processing and Design*

**NEW EDITION**

Michael F. Ashby and D. R. H. Jones

This book develops a detailed understanding of the fundamental properties of engineering materials, how they are controlled by processing, formed, joined and finished, and how all of these factors influence the selection and design of materials in real-world engineering applications.

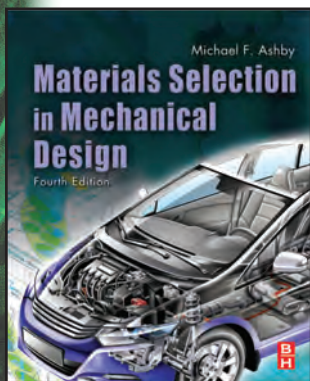
### Table of Contents

Metals: Metal Structures; Equilibrium Constitution & Phase Diagrams; Driving Force for Structural Change; Kinetics of Structural Change: Diffusive Transformations; Nucleation; Displacive Transformations; Light Alloys; Steels; Alloy Steels; Production, Forming & Joining of Metals; Ceramics & Glasses; Structure of Ceramics; Mechanical Properties of Ceramics; Statistics of Brittle Fracture; Production, Forming & Joining of Ceramics; Cements & Concretes; Polymers & Composites; Structure of Polymers; Mechanical Behaviour of Polymers; Production, Forming & Joining of Polymers; Composites: Fibrous, Particulate & Foamed; Wood; Designing with Metals, Ceramics, Polymers & Composites; Design with Materials; Engineering Failures and Disasters – The Ultimate Test of Design; Appendices: Teaching yourself Phase Diagrams; Symbols & Formulae

**Ancillaries:** Solutions Manual

■ Sep 2011 | Paperback | 452 pp. | \$69.95 | €43.95 | £36.99 | ISBN: 978-0-08-096668-7





## Materials Selection in Mechanical Design, Fourth Edition

Michael F. Ashby

Written for all students of engineering, materials science, and design, this is one of the best known, best selling materials and design course texts. It describes the procedures for material selection in mechanical design to ensure that the most suitable materials for a given application are identified from the full range of materials available. Revised and updated for its fourth edition, *Materials Selection in Mechanical Design* offers readers a unique and genuinely innovative resource.

### Table of Contents

Introduction; The Design Process; Engineering Materials and Their Properties; Material Property Charts; Materials Selection – The Basics; Materials Selection – Case Studies; Processes and Process Selection; Process Selection Case Studies; Multiple Constraints and Objectives; Case Studies – Multiple Constraints and Conflicting Objectives; Selection of Materials and Shape; Selection of Materials and Shape: Case Studies; Designing Hybrid Materials; Hybrid Case Studies; Information and Knowledge Sources for Design; Materials and the Environment; Materials and Industrial Design; Forces for Change; Appendices; Exercises; Index

**Ancillaries:** Solutions Manual • Image Bank

■ Sep 2010 | Paperback | 664 pp. | \$89.95 | €42.95 | £35.99 | ISBN: 978-1-85617-663-7



## Materials and Design, Second Edition

*The Art and Science of Material Selection in Product Design*

Michael F. Ashby and Kara Johnson

This renowned book by noted materials engineering author Mike Ashby and industrial designer, Kara Johnson, explores the role of materials and materials processing in product design, with a particular emphasis on creating both desired aesthetics and functionality. The new edition features even more of the highly useful 'materials profiles,' that give critical design, processing, performance, and applications criteria for each material in question.

### Table of Contents

Function and Personality; What Influences Product Design; Design and Designing; The Stuff...Multidimensional Materials; Other Stuff...Shaping, Joining, and Surfaces; Form Follows Material; A Structure for Material Selection; Case Studies in Materials and Design; New Materials – the Potential for Innovation; Conclusions

### PRACTICAL REFERENCES FOR INSPIRATION

Materials Profiles; Shaping Profiles; Joining Profiles; Surface Profiles; Exercises for the Eye and Mind; Selected Materials Maps

■ Oct 2009 | Paperback | 344 pp. | \$59.95 | €42.95 | £36.99 | ISBN: 978-1-85617-497-8



## Materials and the Environment

*Eco-Informed Material Choice*

Michael F. Ashby

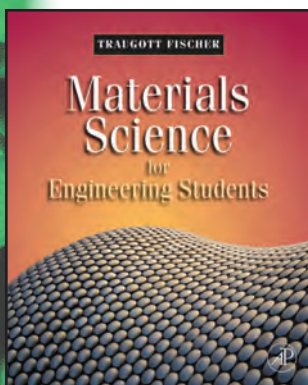
Addressing the growing global concern for sustainable engineering, this is the first book devoted exclusively to environmental aspects of materials. It includes in-depth coverage of such topics as material consumption and its drivers, eco-informed material selection, renewable materials, and sustainability, along with eco-profiles of more than 60 widely used materials.

### Table of Contents

1. Introduction – Material Dependence; 2. Resource Consumption and its Drivers; 3. The Material Life Cycle; 4. End of First Life – A Problem or a Resource?; 5. The Long Reach of Legislation; 6. Eco-data – Values, Sources, Precision; 7. Eco-audits and Eco-audit Tools; 8. Selection Strategies; 9. Eco-informed Material Selection; 10. Sustainability – Living on Renewables; 11. The Bigger Picture – Future Options; 12. Data Sheets – Metals, Polymers, Ceramics, Composites, Natural Materials; Appendix – Units, Conversion factors, etc.

**Ancillaries:** Solutions Manual • Image Bank

■ Feb 2009 | Paperback | 400 pp. | \$69.95 | €50.95 | £43.99 | ISBN: 978-1-85617-608-8



## Materials Science for Engineering Students

Traugott Fischer

This new, concise text emphasizes using an inductive method to introduce materials and their properties and then explaining the underlying phenomena responsible. The book also examines newer classes of materials, such as ceramics, polymers, and composites, treating them as part of two essential classes, structural materials, and functional materials.

### Table of Contents

#### Part I. The Classes of Materials

1. Types of Materials – Electron Energy Bands and Chemical Bonds

#### Part II. Structural Materials

2. The Strength of Materials; 3. Deformation of Metals and Crystal Structures; 4. How to Strengthen Metals; 5. Alloys and Phase Diagrams; 6. Thermal Processing and the Use of Reaction Kinetics; 7. Ferrous and Non-Ferrous Alloys; 8. Ceramics; 9. Polymers; 10. Composites

#### Part III. Functional Materials

11. Conductors, Insulators and Semiconductors; 12. Fabrication of Integrated Circuits and MEMS; 13. Optical Materials; 14. Magnetic Materials; 15. Batteries

#### Part IV. Environmental Interactions

16. Corrosion and Wear; 17. Biomaterials

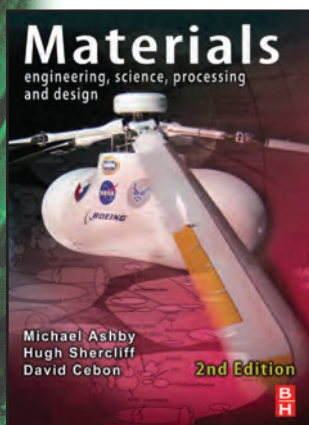
#### Part V. Nanomaterials and the Study of Materials

18. Nanomaterials; 19. The Characterization of Materials

**Ancillaries:** Online Instructor's Manual • Image Bank • Additional Problems and Questions

■ Oct 2008 | Hardback | 600 pp. | \$99.95 | €66.95 | £60.99 | ISBN: 978-0-12-373587-4





## Materials, Second Edition

*engineering, science, processing and design*

Michael F. Ashby, Hugh Shercliff, David Cebon

This is the ultimate materials engineering text and resource for students developing skills and understanding of materials properties and selection for engineering applications. This new edition retains its design-led focus and strong emphasis on visual communication while expanding its treatment of crystallography and phase diagrams and transformations.

### Table of Contents

Introduction: Materials – History and Character; Organizing Materials and Processes; Matching Material to Design; Density and Elastic Moduli; Stiffness-Limited Design; Plasticity, Yielding and Ductility; Strength-Limited Design; Fracture and Fracture Toughness; Cyclic Loading, Damage and Failure; Fracture-Limited Design; Friction and Wear; Materials and Heat; Using Materials at High Temperatures; Conductors, insulators and Dielectrics; Magnetic Materials; Materials for Optical Devices; Oxidation, Corrosion and Degradation; Manufacturing Processes; Processing and Properties; Materials, Processes and the Environment; GL1 – Simple Ideas of Crystallography; GL2 – Phase Diagrams and Phase Transformations; Appendix – Data for Engineering Materials

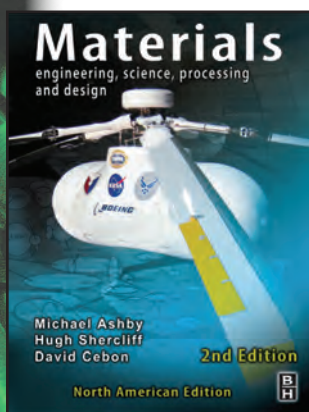
**Ancillaries:** Instructor Manual • Full-Color Solutions Manual • PowerPoint Lecture Slides • Image Bank • Link to Interactive Materials Science Tutorials • Optional Links with the Cambridge Engineering Selector (CES EduPack), the powerful materials selection software (available for purchase through [www.grantadesign.com](http://www.grantadesign.com).)

■ Oct 2009 | Hardback | 672 pp. | \$64.95 | €46.95 | £39.99 | ISBN: 978-1-85617-895-2

### Online Testing Registration Card:

This is the registration card needed to obtain access to Elsevier Online Testing for Ashby et al's *Materials: engineering, science, processing and design, Second Edition*. This test features scores of online questions that are automatically graded by the system, with results and feedback available immediately.

■ Oct 2009 | Cards | \$40.95 | €29.95 | £24.99 | ISBN: 978-1-85617-972-0



## Materials – North American Edition, Second Edition

*engineering, science, processing and design*

Michael F. Ashby, Hugh Shercliff, and David Cebon

This new edition of the ultimate materials engineering text and resource retains its design-led focus and strong emphasis on visual communication while expanding its treatment of crystallography and phase diagrams and transformations. The book is fully linked with the leading materials software package used in over 600 academic institutions worldwide.

### Table of Contents

Introduction: Materials – History and Character; Organizing Materials and Processes; Matching Material to Design; Density and Elastic Moduli; GL1 – Simple Ideas of Crystallography; Stiffness-Limited Design; Plasticity, Yielding and Ductility; Strength-Limited Design; Fracture and Fracture Toughness; Cyclic Loading, Damage and Failure; Fracture-Limited Design; Friction and Wear; Materials and Heat; Using Materials at High Temperatures; Conductors, Insulators and Dielectrics; Magnetic Materials; Materials for Optical Devices; Oxidation, Corrosion and Degradation; Manufacturing Processes; Processing and Properties; GL2 – Phase Diagrams and Phase Transformations; Materials, Processes and the Environment; Appendix – Data for Engineering Materials

**Ancillaries:** See above

■ Book Oct 2009 | Hardback | 672 pp. | \$97.95 | €70.95 | £60.99 | ISBN: 978-1-85617-743-6

■ Book + Online Testing \$117.00 | €84.95 | £73.00 | ISBN: 978-1-85617-893-8



## Fracture Mechanics

Chin-Teh Sun

This text provides new approaches and new applications to advance the understanding of crack formation and propagation. With applications in composite materials, layered structures, and microelectronic packaging among others, this timely coverage is an important resource for anyone studying or applying concepts of fracture mechanics.

### Table of Contents

Introduction; Griffith Theory of Fracture; Elastic Stress Field Around a Crack Tip; Energy Release Rate; Mixed Mode Fracture; Crack Tip Plasticity; Elastic-Plastic Fracture Criteria; Interfacial Cracks Between Two Dissimilar Solids; Cohesive Zone Model; Appendix: Stress Intensity Factors

■ Oct 2011 | Hardback | 312 pp. | \$119.95 | €71.95 | £60.99 | ISBN: 978-0-12-385001-0



## Fluid Mechanics with Multimedia DVD, Fifth Edition

NEW EDITION

Pijush K. Kundu, Ira M. Cohen, and David R. Dowling

The leading advanced text on fluid mechanics, this edition includes a free copy of the DVD 'Multimedia Fluid Mechanics.' The DVD offers students insight into fluid flows through nearly 1,000 fluids video clips. It also allows students to conduct flow simulations in any of more than 20 virtual labs.

### Table of Contents

Introduction; Cartesian Tensors and Tensor Notation; Kinematics; Conservation Laws; Vorticity Dynamics; Ideal Flow; Gravity Waves; Laminar Flow; Boundary Layers and Related Topics; Computational Fluid Dynamics; Instability; Turbulence; Geophysical Fluid Dynamics; Aerodynamics; Compressible Flow; Introduction to Biofluid Mechanics; Nomenclature

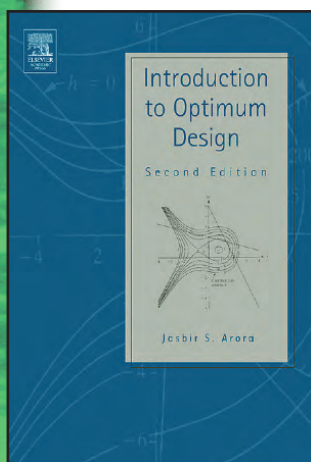
### Appendices:

A: Conversion Factors and Properties of Common Fluids; B: Thermodynamics and Thermal Science; C: Mathematical Tools and Resources; D: Visual Resources; Index

**Ancillaries:** New End-of-Chapter Problems Illustrate Fluid Mechanical Principles • Includes free Multimedia Fluid Mechanics 2e DVD

■ Sep 2011 | Book + CD ROM | 864 pp. | \$119.95 | €64.95 | £54.99 | ISBN: 978-0-12-382100-3





## Introduction to Optimum Design, Third Edition

**NEW EDITION**
**Jasbir Arora**

This is the most widely used textbook in engineering optimization and optimum design courses. It describes an organized approach to engineering design optimization in a rigorous yet simplified style, illustrating various concepts and procedures with examples and demonstrating their applicability to engineering design problems. Excel and MATLAB are featured throughout.

### Table of Contents

1. Introduction to Design Optimization; 2. Optimum Design Problem Formulation; 3. Graphical Optimization; 4. Optimum Design Concepts; 5. More on Optimum Design Concepts; 6. Excel Solver and MATLAB for Optimum Design; 7. Practical Design Examples; 8. Linear Programming Methods for Optimum Design; 9. More on Linear Programming Methods for Optimum Design; 10. Numerical Methods for Unconstrained Optimum Design; 11. More on Numerical Methods for Unconstrained Optimum Design; 12. Numerical Methods for Constrained Optimum Design; 13. More on Numerical Methods for Constrained Optimum Design; 14. Design Optimization Applications with Implicit Functions; 15. Discrete Variable Optimum Design Concepts and Methods; 16. Genetic Algorithms for Optimum Design; 17. Multi-objective Optimum Design Concepts and Methods; 18. Global Optimization Concepts and Methods for Optimum Design; 19. More Topics on Optimum Design; Appendix

■ Sep 2011 | Book + CD ROM | 864 pp. | \$119.95 | €64.95 | £54.99 | ISBN: 978-0-12-382100-3



## Measurement and Instrumentation

### Theory and Application

**Alan S. Morris**

This successful book introduces undergraduate students to the measurement principles and the range of sensors and instruments that are used for measuring physical variables. Completely updated to include new technologies such as smart sensors, displays, and interfaces, this edition also contains plenty of worked examples and self-assessment questions.

### Table of Contents

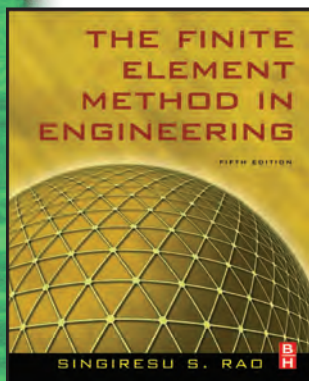
#### Part A: Principles of Measurement

Introduction to Measurement; Types of Instrument and Performance Characteristics; Errors During the Measurement Process; Calibration of Measuring Sensors and Instruments; Measurement Noise and Signal Processing; Measurement and Transducing of Sensor Outputs; Intelligent Instruments; Signal Transmission; Instrumentation/Computer Networks; Display, Recording and Presentation of Measurement Data; Measurement System Reliability and Instrument Choice; Sensor Technologies

#### Part B: Measurement sensors and instruments

Temperature Measurement; Pressure Measurement; Flow Measurement; Level Measurement; Force and Torque Measurement; Translational Displacement Transducers; Translational Velocity, Acceleration, Vibration and Shock Measurement; Rotational Displacement Transducers; Rotational Velocity and Acceleration Measurement; Dimension Measurement; Measurement of Miscellaneous Quantities; Appendices

■ Sep 2011 | Paperback | 556 pp. | \$99.95 | €53.95 | £44.99 | ISBN: 978-0-12-381960-4



## The Finite Element Method in Engineering, Fifth Edition

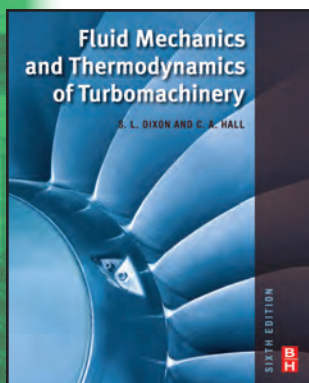
S. S. Rao

This text provides a thorough grounding of the mathematical principles for setting up finite element solutions in civil, mechanical, and aerospace engineering applications. The new edition includes examples using modern computer tools such as MatLab, Ansys, Nastran, and Abaqus. Professional engineers will benefit from the introduction to useful FEA applications.

### Table of Contents

Overview of the Finite Element Method; Discretization of the Domain; Interpolation Models; Higher Order and Isoparametric Elements; Derivation of Element Matrices and Vectors; Assembly of Element Matrices and Vectors and Derivation of System Equations; Numerical Solution of Finite Element Equations; Basic Equations and Solution Procedure; Analysis of Trusses; Beams and Frames; Analysis of Plates; Analysis of Three-Dimensional Problems; Dynamic Analysis; Formulation and Solution Procedure; One-Dimensional Problems; Two-Dimensional Problems; Three-Dimensional Problems; Basic Equations of Fluid Mechanics; Inviscid and Irrotational Flows; Viscous and Non-Newtonian Flows; Solution of Quasi-Harmonic Equations (WEB Chapter); Solution of Helmholtz Equation (WEB Chapter); Solution of Reynolds Equation (WEB Chapter); Appendix A: Green Gauss Theorem; Appendix B: Use of Commercial Software: ANSYS, ABAQUS, and NASTRAN

■ Nov 2010 | Hardback | 726 pp. | \$119.95 | €58.95 | £49.99 | ISBN: 978-1-85617-661-3



## Fluid Mechanics and Thermodynamics of Turbomachinery, Sixth Edition

S. L. Dixon and C. A. Hall

Turbomachinery is a challenging and diverse field, with applications for professionals and students in many subsets of the mechanical engineering discipline, including fluid mechanics, combustion and heat transfer, dynamics and vibrations, as well as structural mechanics, and materials engineering. This is the leading turbomachinery textbook.

### Table of Contents

Introduction-Basic Principles; Dimensional Analysis: Similitude; Two-dimensional Cascades; Axial-flow Turbines: Mean-line Analysis and Design; Axial-flow Compressors and Ducted Fans; Three-dimensional Flows in Axial Turbomachines; Centrifugal Pumps, Fans and Compressors; Radial Flow Gas Turbines; Hydraulic Turbines; Wind Turbines;

### Appendices

A: Preliminary Design of an Axial-flow Turbine for a Large Turbocharger; B: Preliminary Design of a Centrifugal Compressor for a Turbocharger; C: Tables for the Compressible Flow of a Perfect Gas; D: Conversion of British and US Units to SI Units; E: Answers to Selected Problems; Index

**Ancillaries:** Solutions Manual • Image Bank

■ Mar 2010 | Hardback | 477 pp. | \$89.95 | €47.95 | £39.99 | ISBN: 978-1-85617-793-1





## Modern Engineering Thermodynamics – Textbook with Tables Booklet

Robert T. Balmer

This text covers material suitable for both a basic thermodynamics course and an applied thermodynamics course. It offers numerous features that are unique among engineering textbooks, including historical vignettes, critical thinking boxes, and case studies. A separate tables booklet for exams is included.

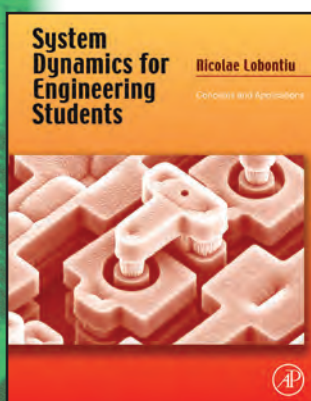
### Table of Contents

The Beginning; Thermodynamic Concepts; Thermodynamic Properties; The First Law of Thermodynamics and Energy Transport Mechanisms; First Law Closed System Applications; First Law Open System Applications; The Second Law of Thermodynamics: Entropy Transport and Production Mechanisms; Second Law Closed System Applications; Second Law Open System Applications; Availability Analysis; General Thermodynamic Property Relations; Mixtures of Gases and Vapors; Vapor and Gas Power Cycles; Vapor and Gas Refrigeration Cycles; Chemical Thermodynamics; Compressible Fluid Flow; Thermodynamics of Biological Systems; Introduction to Statistical Thermodynamics; Introduction to Coupled Phenomena; Appendix A: Physical Constants and Conversion Factors; Appendix B: Greek and Latin Origins of Engineering Terms

**Included in Booklet:** *Tables to Accompany Modern Engineering Thermodynamics*  
Thermodynamic Tables; Thermodynamic Charts

**Ancillaries:** Solutions Manual • Learning Library • PPT Lecture Slides • Elsevier Online Testing

- **Book** Dec 2010 | Hardback | 855 pp. | \$119.95 | €54.95 | £45.99 | ISBN: 978-0-12-385073-7
- **Book + Online Testing** \$129.95 | €59.95 | £49.99 | ISBN: 978-0-12-385077-5



## System Dynamics for Engineering Students

### Concepts and Applications

Lobontiu: [System Dynamics Registration card for Online Testing](#)

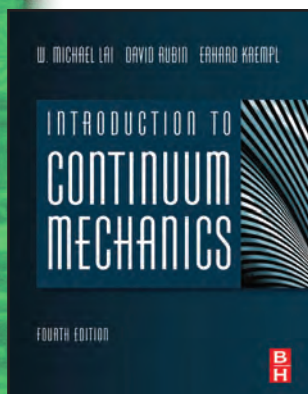
Lobontiu: [Q Site for System Dynamics for Engineering Students](#)

Nicolae Lobontiu

This book rearranges a classical approach to system dynamics into a more logical teaching progression. It provides balanced coverage of the main field systems and is the first system dynamics textbook to include extensive examples from the relatively new application areas of microelectromechanical systems (MEMS) and compliant mechanical devices.

This is the first system dynamics textbook to introduce examples from compliant mechanisms and micro/nano electromechanical systems and to include a chapter on the important area of coupled-field systems. With a balanced treatment of mechanical and electrical systems, it provides a systematic approach to modeling and analyzing system dynamics problems

- **Book** Mar 2010 | Hardback | 532 pp. | \$129.95 | €92.95 | £79.00 | ISBN: 978-0-240-81128-4
- **Book + Online Testing** \$139.95 | €100.00 | £85.00 | ISBN: 978-0-12-381990-1



## Introduction to Continuum Mechanics, Fourth Edition

W. Michael Lai, David H. Rubin, and Erhard Krempf

Continuum mechanics is the basis for defining and explaining all major forms of mechanical behavior, including stress and strain, elasticity, and plasticity. This new edition of the classic text on the subject offers improvements to address evolving teaching methods including expanded and improved problem sets and more real-world applications.

### Table of Contents

Introduction: Continuum Theory, Contents of Continuum Mechanics

#### TENSORS

Part A: The Indicical Notation; Part B: Tensors; Part C: Tensor Calculus; Part D: Curvilinear Coordinates

#### KINEMATICS OF A CONTINUUM; STRESS; THE ELASTIC SOLID

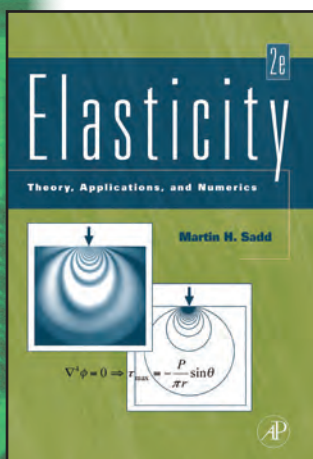
Part A: Linear Isotropic Elastic Solid; Part B: Linear Anisotropic Elastic Solid; Part C: Constitutive Equation for Isotropic Elastic Solid Under Large Deformation

#### NEWTONIAN VISCOUS FLUID; INTEGRAL FORMULATION OF GENERAL PRINCIPLES; NON-NEWTONIAN FLUIDS

Part A: Linear Viscoelastic Fluid; Part B: Nonlinear Viscoelastic Fluid; Part C: Viscometric Flow of Simple Fluid

**Ancillaries:** Solutions Manual • Figures from Text

■ Aug 2009 | Hardback | 536 pp. | \$97.95 | €70.95 | £60.99 | ISBN: 978-0-7506-8560-3



## Elasticity, Second Edition

*Theory, Applications, and Numerics*

Martin H. Sadd

This book provides a concise presentation and development of the theory of elasticity, moving from solution methodologies, formulations and strategies into applications of contemporary interest, including fracture mechanics, micromechanics, and computational methods. This new edition is the only elasticity text to cover the new area of non-homogenous material behavior.

### Table of Contents

Mathematical Preliminaries; Deformation: Displacements and Strains; Stress and Equilibrium; Material Behavior-Linear Elastic Solids; Formulation and Solution Strategies; Strain Energy and Related Principles; Two-Dimensional Formulation; Two-Dimensional Problem Solution; Extension, Torsion and Flexure of Elastic Cylinders; Complex Variable Methods; Anisotropic Elasticity; Thermoelasticity; Displacement Potentials and Stress Functions; Nonhomogeneous Elasticity; Micromechanics Applications; Numerical Finite and Boundary Element Methods

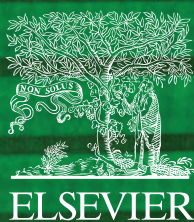
#### Appendices

A: Basic Field Equations in Cartesian, Cylindrical and Spherical Coordinates; B: Transformation of Field Variables Between Cartesian, Cylindrical and Spherical Components; C: MATLAB Primer; D: Review of Mechanics of Materials

**Ancillaries:** Instructor Solutions Manual

■ Jan 2009 | Hardback | 552 pp. | \$99.95 | €72.95 | £62.99 | ISBN: 978-0-12-374446-3





# CUSTOMER SERVICE INDEX

## **NORTH AMERICAN SALES CONTACTS:**

North American Retail Sales:  
**nabooksales@elsevier.com**

Corporate/Bulk Sales:  
**corporatesales@elsevier.com**

Colleges/Universities:  
**textbook@elsevier.com**

Career Schools:  
**textbook@elsevier.com**

## **GLOBAL SALES CONTACTS:**

UK & Ireland:  
**guy.simpson@elsevier.com**

Europe (excluding UK & Ireland):  
**r.ramacciotti@elsevier.com**

Middle East, Africa, & Caribbean:  
**k.beran@elsevier.com**

Australia, New Zealand, & Fiji:  
**miriam.thomas@elsevier.com**

Japan:  
**jp.stbooks@elsevier.com**

## **CUSTOMER SERVICE CONTACTS:**

### **United States and Canada:**

Email: [BooksCustomerService-usa@elsevier.com](mailto:BooksCustomerService-usa@elsevier.com)

US Customers:

Toll Free: +1 (800) 545-2522

Fax: +1 (800) 535-9935

Customers Outside US:

Toll Free: +1 (800) 460-3110

Tel: +1 (314) 447-8010

Fax: +1 (314) 447-8030

### **Latin America and the Caribbean:**

Tel: 1 314 453 7010

Fax: 1 314 453 7095

Email Brazil, Caribbean:

[USBKbracarib@elsevier.com](mailto:USBKbracarib@elsevier.com)

Email Mexico, all other countries:

[USBKLatMex@elsevier.com](mailto:USBKLatMex@elsevier.com)

### **UK, Europe, Middle East, and Africa:**

Email: [eurobkinfo@elsevier.com](mailto:eurobkinfo@elsevier.com)

Tel: +44 (0)1865 844644

Fax: +44 (0)1865 853301

### **Australia, New Zealand, & Fiji:**

Email: [customerserviceau@elsevier.com](mailto:customerserviceau@elsevier.com)

Toll Free Australia: 1800 263 951

Toll Free New Zealand: 0800 170 165

Toll Free Fax New Zealand: 0800 170 160

Tel: +61 (02) 9422 8557

Fax: +61 (02) 9422 8501

### **Asia (excluding India and Japan):**

Email: [asiabkinfo@elsevier.com](mailto:asiabkinfo@elsevier.com)

Tel: +65 6349 0222

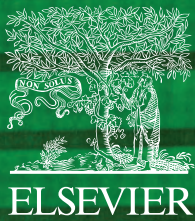
Fax: +65 6733 1510

### **India:**

Email: [csindia@elsevier.com](mailto:csindia@elsevier.com)

### **Japan:**

Email: [jp.stbooks@elsevier.com](mailto:jp.stbooks@elsevier.com)



# FURTHER INFORMATION

All publication dates, prices, and other details are correct at the time of going to press, but are subject to change without further notice.

## SECURE ONLINE ORDERING

Order online at [elsevierdirect.com](http://elsevierdirect.com). Sign up today at [elsevierdirect.com](http://elsevierdirect.com) to receive exclusive offers, including discounts, free chapter downloads, video clips, contests, and more.



## PROFESSORS/INSTRUCTORS

Register at our instructor site, <http://textbooks.elsevier.com>, to browse our list of cutting-edge books at student-friendly prices, request review copies, access ancillaries, view selected books electronically, and contact your textbook representative.

## CORPORATE/BULK/SPECIAL SALES/CUSTOM CONTENT

For bulk purchases or to explore customized content for your corporation, please see [elsevierdirect.com/corporatesales](http://elsevierdirect.com/corporatesales) or e-mail the Elsevier corporate sales team at [corporatesales@elsevier.com](mailto:corporatesales@elsevier.com).

## PRESS

If you are a member of the press and would like a gratis copy of any book to consider for review, excerpt, or an author interview, please e-mail the Elsevier Publicity Team at [bookpublicity@elsevier.com](mailto:bookpublicity@elsevier.com).

## LIBRARIANS

Librarians can register for this free site, <http://www.virtualelibrary.com>, specifically designed to fit their needs. Save frequently used search criteria, create wish lists, read peer reviews, and more.





ELSEVIER

A5

A10

A15

A20

A25

