

# 2007-2008 *NEW* Aerospace Engineering Titles

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by M. Gopal, Indian Institute of Technology (IIT), Delhi  
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### ELECTRONIC INSTRUMENTS AND SYSTEMS

by R R Gupta, Northern India Engineering College and BBD National Institute of Technology and Management, Lucknow  
2001 / 584 pages  
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(Tata McGraw-Hill Title)

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by Joseph DiStefano, University of California, Los Angeles; Allen Stubberud, UCLA; Ivan William, TRW Space and Technology  
1990 / 572 pages  
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## Dynamics

*International Edition*



### VECTOR MECHANICS FOR ENGINEERS: DYNAMICS

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2007  
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For the past fifty years Beer and Johnston have been the uncontested leaders in the teaching of undergraduate engineering mechanics. Over the years their textbooks have introduced significant theoretical and pedagogical innovations in statics, dynamics, and mechanics of materials education. At the same time, their careful presentation of content, unmatched levels of accuracy and attention to detail have made their texts the standard for excellence. The new Eighth Edition of Vector Mechanics for Engineers: Dynamics marks the fiftieth anniversary of the Beer/Johnston series. Continuing in the spirit of its successful previous editions, the Eighth Edition provides conceptually accurate and thorough coverage together with a significant addition of new problems, including biomechanics problems, and the most extensive media resources available.

#### NEW TO THIS EDITION

- The 8th editions offer a 48% new or revised homework problem set, with biomechanics-focused problems added appropriately throughout the texts.
- The photo program continues to be expanded in each edition, with new chapter opener and in chapter photos added to each chapter.
- A C.O.S.M.O.S. Solutions Manual, provided to instructors on DVD, allows for assignment generation, tracking, and distribution. Instructors also have the ability to edit homework problems.
- A robust Online Learning Center provides both student and instructor resources including algorithmic problems, S.M.A.R.T. tutorials, lecture PowerPoint's, and images from the text, among other resources.
- McGraw-Hill's web-based Hands-on Mechanics teaching demonstration library provides instructors with instructions for building hands-on physical models used to demonstrate important Statics and Dynamics concepts in class.

#### FEATURES

- A careful, step-by-step presentation is followed in each lesson of each chapter and every chapter is organized as follows: an opening photograph to help students visualize key concepts is followed by a chapter introduction with a chapter outline previewing what will be covered in each lesson. After each lesson there are 1-4 Sample Problems (set up to serve as a model for student solutions) followed

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- Computer Problems, relevant to the design process, are offered at the end of each chapter. While the problems will be generic, they will be designed to be easily solved using popular computational programs such as Matlab, Mathcad, Maple, etc. The computer problems focus on symbolic manipulation and plotting, as opposed to the more programming-based computer problems in the current editions. Computer problems help students gain a better understanding of basic principles because most require integration of several concepts, much like one does in design. They also allow for open-ended parametric studies.
- A Fundamentals of Engineering Examination Appendix helps prepare students for the FE/EIT exam.
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Jeff Jones, California Polytechnic State University

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by Marcelo R M Crespo da Silva, Rensselaer Polytech Institute—Troy

2004 / 672 pages

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## CONTENTS

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Chapter 1: Introduction. Chapter 2: Basic Principles. Chapter 3: Relative Motion. Chapter 4: Dynamics of a System of Particles. Chapter 5: Analytical Mechanics: Basic Concepts. Chapter 6: Analytical Mechanics: Additional Concepts. Chapter 7: Rigid-Body Geometry Chapter 8: Rigid Body Kinematics. Chapter 9: Rigid Body Dynamics: Basic Concepts. Chapter 10: Rigid Body Dynamics: Advanced Concepts. Chapter 11: Qualitative Analysis of Rigid Body Motion. Chapter 12: Dynamics of Lightly Flexible Bodies. Appendices: Chapter A: A History of Mechanics. Chapter B: Concepts from the Calculus of Variations. Chapter C: Common Mass Moments of Inertia.

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by Ferdinand P Beer (deceased), E Russell Johnston, Jr., University of Connecticut, Elliot R Eisenberg, Pennsylvania State University and David Mazurek, U S Coast Guard Academy

2007 / Hardcover / 648 pages

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#### Second Edition

by Steven C. Chapra, Tufts University

2008 (November 2006) / Hardcover / 544 pgs

ISBN-13: 978-0-07-313290-7 / MHID: 0-07-313290-X

*The web site features student and instructor resources such as an image bank, lecture slides, helpful web links, study objectives, and more!*

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Steven Chapra's second edition, Applied Numerical Methods with MATLAB for Engineers and Scientists, is written for engineers and scientists who want to learn numerical problem solving. This text focuses on problem-solving (applications) rather than theory, using MATLAB, and is intended for Numerical Methods users; hence theory is included only to inform key concepts. The second edition feature new material such as Numerical Differentiation and ODE's: Boundary-Value Problems.

For those who require a more theoretical approach, see Chapra's best-selling Numerical Methods for Engineers, 5/e (2006), also by McGraw-Hill.

#### NEW TO THIS EDITION

- Based on response from users and reviewers, 4 New Chapters have been added to the second edition to provide a more accessible presentation, while maintaining its student-friendly flavor.

- ~ Optimization

- ~ Numerical Differentiation

- ~ ODEs: Boundary-Value Problems

- ~ Fast Fourier Transform. This appendix chapter is presented in an introductory fashion to illustrate the power of MATLAB and to let students go away recognizing that although they have just scratched the surface, they might want to pursue the topic in greater depth in future courses.

- 50% new or revised chapter and homework problems

#### FEATURES

- Explanations are straight-forward and practically oriented. The math level is considered, just to be at the right level—not too easy or rigorous, just right.

- Extensive use of engineering examples, case studies, and applications are given throughout the text.

- Each chapter is well integrated with MATLAB M-files. In addition, relevant MATLAB functions are introduced in each chapter.

- MATLAB is used as the primary computing environment. All algorithms are presented as m-files.

- A text Web site is available at <http://www.mhhe.com/chapra>

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2006 / Hardcover / 960 pgs

ISBN-13: 978-0-07-310156-9 / MHID: 0-07-310156-7

Website: Browse <http://www.mhhe.com/chapra>

The fifth edition of Numerical Methods for Engineers continues its tradition of excellence. Instructors love this text because it is a comprehensive text that is easy to teach from. Students love it because it is written for them—with great pedagogy and clear explanations and examples throughout. The text features a broad array of applications, including all engineering disciplines. The revision retains the successful pedagogy of the prior editions. Chapra and Canale's unique approach opens each part of the text with sections called Motivation, Mathematical Background, and Orientation, preparing the student for what is to come in a motivating and engaging manner. Each part closes with an Epilogue containing sections called Trade-Offs, Important Relationships and Formulas, and Advanced Methods and Additional References. Much more than a summary, the Epilogue deepens understanding of what has been learned and provides a peek into more advanced methods. Users will find use of software packages, specifically MATLAB and Excel with VBA. This includes material on developing MATLAB m-files and VBA macros. Approximately 80% of the problems are new or revised for this edition. The expanded breadth of engineering disciplines covered is especially evident in the problems, which now cover such areas as biotechnology and biomedical engineering.

### NEW TO THIS EDITION

- Approximately 80% of the problems are new or revised for this edition.
- Users will have access to an Online Learning Center which will house PPT slides of all text figures, M-Files, general textbook information and more!
- Available to instructors only, the detailed solutions for all text problems will be delivered via CD-ROM, in our new, Complete Online Solutions Manual Organization System (COSMOS).

### FEATURES

- Challenging problems drawn from all engineering disciplines are included in the text.
- Chapra is known for his clear explanations and elegantly rendered examples.
- The text includes a helpful appendix chapter, Getting Started with MATLAB.

### CONTENTS

**Part 1 Modeling, Computers, and Error Analysis.** 1 Mathematical Modeling and Engineering Problem Solving. 2 Programming and Software. 3 Approximations and Round-Off Errors. 4 Truncation Errors and the Taylor Series. **Part 2 Roots of Equations.** 5 Bracketing Methods. 6 Open Methods. 7 Roots of Polynomials. 8 Case Studies: Roots of Equations. **Part 3 Linear Algebraic Equations.** 9 Gauss Elimination. 10 LU Decomposition and Matrix Inversion. 11 Special Matrices and Gauss-Seidel. 12 Case Studies: Linear Algebraic Equations. **Part 4 Optimization.** 13 One-Dimensional Unconstrained Optimization. 14 Multidimensional Unconstrained Optimization. 15 Constrained Optimization. 16 Case Studies: Optimization. **Part 5 Curve Fitting.** 17 Least-Squares Regression. 18 Interpolation. 19 Fourier Approximation. 20 Case Studies: Curve Fitting. **Part 6 Numerical Differentiation and Integration.** 21 Newton-Cotes Integration Formulas. 22 Integration of Equations. 23 Numerical Differentiation. 24 Case Studies: Numerical Integration and Differentiation. **Part 7 Ordinary Differential Equations.** 25 Runge-Kutta Methods. 26 Stiffness and Multistep Methods. 27 Boundary-Value and Eigenvalue Problems. 28 Case Studies: Ordinary Differential Equations. **Part 8 Partial Differential Equations.** 29 Finite Difference: Elliptic Equations. 30 Finite Difference: Parabolic Equations. 31 Finite-Element Method. 32 Case Studies: Partial Differential Equations. **Appendix A** The Fourier Series. **Appendix B** Getting Started with Matlab. Bibliography. Index.

## Stress Analysis

*International Edition*

### INTERMEDIATE MECHANICS OF MATERIALS

by James R Barber, University of Michigan, Ann Arbor

2001 / 608 pages / Hardcover

ISBN-13: 978-0-07-232519-5 / MHID: 0-07-232519-4

ISBN-13: 978-0-07-118147-1 / MHID: 0-07-118147-4 [IE]

Website: <http://www.mhhe.com/engcs/mech/barber>

### CONTENTS

1 Introduction. 2 Material Behavior and Failure. 3 Energy Methods. 4 Unsymmetrical Bending. 5 Elastic-Plastic Bending. 6 Shear and Torsion of Thin-Walled Beams. 7 Membrane Stresses in Axisymmetric Shells. 8 Beams On Elastic Foundations. 9 Axisymmetric Bending of Cylindrical Shells. 10 Thick Walled Cylinders and Disks. 11 Curved Beams. 12 Elastic Stability. A The Finite Element Method. B Properties of Areas. C Stress Concentration Factors.

*International Edition*

### ADVANCED STRENGTH AND APPLIED STRESS ANALYSIS

#### Second Edition

by Richard Budynas, Rochester Institute of Technology

1999 / 720 pages

ISBN-13: 978-0-07-008985-3 / MHID: 0-07-008985-X

ISBN-13: 978-0-07-116099-5 / MHID: 0-07-116099-X [IE]

### CONTENTS

Chapter 1 Basic Concepts of Force, Stress, Strain, and Displacement Chapter 2 Stress and Strain. Transformations, Equilibrium, and Compatibility. Chapter 3 Fundamental Formulations of Stress, Strain, and Deflection. Chapter 4 Concepts from the Theory of Elasticity. Chapter 5 Topics from Advanced Mechanics of Materials. Chapter 6 Energy Techniques in Stress Analysis. Chapter 7 Strength Theories and Design Methods. Chapter 8 Experimental Stress Analysis. Chapter 9 Introduction to the Finite Element Method. Chapter 10 Finite Element Modeling Techniques. Appendix A SI and USCU Conversions. Appendix B Properties of Cross Sections. Appendix C Beams in Bending. Appendix D Singularity Functions. Appendix E Principal Second-area Moments. Appendix F Stress Concentration Factors. Appendix G Strain Gage Rosette Equations. Appendix H Corrections for Transverse Sensitivity of Strain. Appendix I Matrix Algebra and Cartesian Tensors.

## Fluid Mechanics (Introduction)

International Edition

NEW

### ESSENTIALS OF FLUID MECHANICS Fundamentals and Applications with Student Resource DVD

John M. Cimbala, Pennsylvania State University-University Park, and Yunus A. Cengel, University Of Nevada-Reno

2008 (September 2006) / Hardcover

ISBN-13: 978-0-07-330112-9 / MHID: 0-07-330112-4

(with Student Resources DVD)

ISBN-13: 978-0-07-128597-1 / MHID: 0-07-128597-0 [IE]

The Online Learning Center will house numerous instructor and student resources such as lecture slides, an image library, FE Exam questions, text glossary, flashcards, web links, and more! (Browse <http://www.mhhe.com/cengel>)

Essentials of Fluid Mechanics: Fundamentals and Applications is an abridged version of a more comprehensive text by the same authors, Fluid Mechanics: Fundamentals and Applications (McGraw-Hill 2006). Suitable for a one-semester course, this text communicates directly with tomorrow's engineers in a simple yet precise manner. It covers the basic principles and equations of fluids in the context of numerous, diverse real-world engineering examples, and it helps students develop an intuitive understanding of fluid mechanics by emphasizing the physics. An abundance of figures, photographs and supplemental visual aids spark curiosity and reinforce the physics.

#### FEATURES

- An abridged version of the successful, Fluid Mechanics: Fundamentals and Applications by Yunus Cengel and John Cimbala (McGraw-Hill 2006), this text is suitable for a one-semester course in fluid mechanics.
- This text emphasizes the physical aspects of fluid mechanics in addition to mathematical representations and manipulations.
- Since fluid mechanics is a highly visual subject, the Cimbala text features 660 illustrations and photographs. Also included is an outstanding media program that includes narrated videos and animations.
- Topic Flexibility facilitates different approaches by covering the basics for all majors and then offers robust coverage to allow mechanical, civil, or aerospace engineering approaches.
- A Student Resources DVD is included with each text. The DVD includes the Limited Academic Version of Engineering Equation Solver (EES) with scripted solutions to select text problems and narrated Fluid Mechanics visualization videos.
- An Online Learning Center is available for students and instructors at <http://www.mhhe.com/cengel>.
- This text features Hands-on Mechanics as an additional resource for instructors. Hands-on Mechanics is a website designed for instructors who are interested in incorporating 3-Dimensional, hands-on teaching aids into their lectures.

#### CONTENTS

1 Introduction and Basic Concepts. 2 Properties of Fluids. 3 Pressure and Fluid Statics. 4 Fluid Kinematics. 5 Mass, Bernoulli, and Energy Equations. 6 Momentum Analysis of Flow Systems. 7 Dimensional Analysis and Modeling. 8 Internal Flow. 9 Differential Analysis of Fluid Flow. 10 External Flow: Drag and Lift. 11 Open-Channel Flow. 12 Turbomachinery.

International Edition

NEW

### FLUID MECHANICS

#### Sixth Edition

by Frank M. White, University Of Rhode Island-Kingston

2008 (October 2006) / Hardcover / 896 pages

ISBN-13: 978-0-07-330920-0 / MHID: 0-07-330920-6 (with Aris bind-in card and Student DVD)

ISBN-13: 978-0-07-128646-6 / MHID: 0-07-128646-2 [IE, with Aris bind-in card and Student DVD]

Browse <http://www.mhhe.com/white6e>

White's Fluid Mechanics sixth edition will continue the text's tradition of excellent problems of different types, precision and accuracy, and good application of concepts to engineering. The new 6th edition will feature the best general problem-solving approach to date, presented at the start of the book and carefully integrated in all examples. Students can progress from general ones to those involving design, multiple steps and computer usage. Word problems are included to build readers' conceptual understanding of the subject, and FE Exam problems (in multiple-choice format) are included. EES (Engineering Equation Solver) software is included so that students can effectively use the computer to model, solve and modify typical fluid mechanics problems. A DVD containing EES is free with every book, and Appendix E describes its use and application to fluid mechanics. A limited version of EES, that does not expire, is included on the CD ROM; users of the book can also download and distribute the full Academic Version of EES, which is renewed annually with a new username and password. Also an animation library will be included as will an unlimited amount of problems, due to ARIS.

#### NEW TO THIS EDITION

- The exciting new supplements package includes a rich array of resources for students and instructors. For students there is a new Student Resource DVD that contains visualizations, Fluent's animation libraries, EES software, and scripted EES problems. The book's ARIS site includes interactive FE Exam Quizzes and Algorithmic Problems for students, as well as images and solutions for instructors. This book will also feature Hands on Mechanics! A Student Study Guide will also be available. This makes us unique compared to the competition
- New examples have been added, and as in the 5th edition, these examples and the book's problems feature such modern engineering applications as biofluidics and nano-technology applications of fluids.
- Features best general problem-solving approach to date, presented at the start of the book and carefully integrated in all examples.
- The 6th edition continues White's tradition of offering easy-to-follow explanations that are more realistic than any other book in terms of how problems are actually solved.
- 30% of the problems are new or revised.

#### FEATURES

- Excellent progression from physical concepts to engineering applications.

#### CONTENTS

1. Introduction. 2. Pressure Distribution. 3. Integral Relations for a Control Volume. 4. Differential Relations for Fluid Flow. 5. Dimensional Analysis and Similarity. 6. Viscous Flow in Ducts. 7. Flow Past Immersed Bodies. 8. Potential Flow and Computational Fluid Dynamics. 9. Compressible Flow. 10. Open-Channel Flow. 11. Turbomachinery. Appendix A Physical Properties of Fluids. Appendix B Compressible Flow Tables. Appendix C Conversion Factors. Appendix D Equations of Motion in Cylindrical Coordinates. Appendix E Introduction to EES. Answers to Selected Problems. Index

*International Edition*

## FLUID MECHANICS:

### Fundamentals & Applications with CD

by Yunus A Cengel, University of Nevada-Reno and John M Cimbala, Pennsylvania State University—University Park

2006

ISBN-13: 978-0-07-304465-1 / MHID: 0-07-304465-2

(with Student Resources DVD)

ISBN-13: 978-0-07-124934-8 / MHID: 0-07-124934-6 [IE]

Website: <http://www.mhhe.com/cengel>

FluidMechanics:FundamentalsandApplicationscommunicates directly with tomorrow's engineers in a simple yet precise manner. The text covers the basic principles and equations of fluid mechanics in the context of numerous and diverse real-world engineering examples. The text helps students develop an intuitive understanding of fluid mechanics by emphasizing the physics, and by supplying attractive figures, numerous photographs and visual aids to reinforce the physics.

#### FEATURES

- **EMPHASIS ON PHYSICS.** This text emphasizes the physical aspects of the subject matter in addition to mathematical representations and manipulations. The authors believe that the emphasis in undergraduate education should remain on developing a sense of the underlying physical mechanisms and a mastery of solving practical problems than an engineer is likely to face in the real world.
- **VISUAL PROGRAM.** fluid mechanics is a highly visual subject, and students learn more effectively by visual stimulation. Our text features more illustrations and photographs than other books in this category. Some of the figures and photographs in the text are intended to serve as a means of emphasizing key concepts that would otherwise go unnoticed; some serve as page summaries.
- **VIDEO CLIPS AND ANIMATIONS.** In addition to text figures and photographs, there are narrated video clips of fluid mechanics experiments that complement the text material. There are also dozens of animations created with computational fluid dynamics. Both the video clips and animations can be found on the DVD that accompanies the text.
- **SYSTEMATIC SOLUTION PROCEDURE.** A well-structured approach is used in problem solving while maintaining an informal conversational style. The problem is first stated and the objectives are identified, and the assumptions made are stated together with their justifications. The properties needed to solve the problem are listed separately. Numerical values are used together with their units to emphasize that numbers without units are meaningless, and unit manipulations are as important as manipulating the numerical values with a calculator. The significance of the findings is discussed following the solutions. This approach is also used consistently in the solutions presented in the Instructor's Solutions Manual.
- **REALISTIC END-OF-CHAPTER PROBLEMS.** End-of-chapter problems are grouped under specific topics in the order they are covered to make problem selection easier for both instructors and students. Within each group of problems are **CONCEPT QUESTIONS**, to check the students' level of understanding of basic concepts. The **COMPREHENSIVE AND REVIEW PROBLEMS** are not directly tied to any specific section of a chapter—in some cases they require review of material used in previous chapters.
- **DESIGN AND ESSAY PROBLEMS.** This special category of end-of-chapter problems encourages students to make engineering judgments, to conduct independent exploration of topics of interest, and to communicate their findings in a professional manner.
- **COMPUTER PROBLEMS.** Throughout the text comprehensive problems that require conducting extensive parametric studies are incorporated using either a spreadsheet or the enclosed EES (or other suitable) software. These problems are designated by a computer icon for easy recognition.
- **CHAPTER ON CFD.** Commercial CFD (Computational Fluid Dynamics) codes are used widely in engineering practice in the design and analysis of flow systems, and it has become exceedingly important for students to have a solid understanding of the fundamental aspects, capabilities, and common pitfalls of CFD. Chapter 15 describes the fundamental concepts of CFD, and shows

students how to use commercial CFD codes as a tool to solve complex fluid mechanics problems. We emphasize the application of CFD rather than the algorithms used in CFD code.

- **APPLICATIONS SPOTLIGHT.** Written by guest authors, this feature is designed to show how fluid mechanics has diverse applications in a wide variety of fields. The Application Spotlights highlight industry and university research worldwide.
- **CHOICE OF SI ALONE OR SI/ENGLISH UNITS.** In recognition of the fact that English units are still widely used in some industries, both SI and English units are used in this text, with an emphasis on SI. Problems, tables, and charts in English units are designated by "E" after the number for easy recognition, and they can be ignored easily by SI users.
- **ACCURACY.** The accuracy of the book will be insured by thorough testing.
- **STUDENT DVD:** Packaged free with the text, the Student Resources DVD features: 1) Limited Academic Version of EES (Engineering Equation Solver) software with scripted solutions to selected text problems 2) Video Clips of fluid mechanics experiments; and 3) Animations Library (Courtesy of Fluent, Inc.) offering dozens of animations created with CFD.
- **INSTRUCTOR'S RESOURCE CD.** This CD provides all of the text images in Jpeg and PowerPoint formats and the detailed solutions to all text problems are delivered in our electronic solutions manual and organization system—COSMOS. COSMOS is a database management tool geared toward assembling homework assignments, tests, and quizzes.

#### CONTENTS

1 Introduction and Basic Concepts. 2 Properties of Fluids. 3 Pressure and Fluid Statics. 4 Fluid Kinematics. 5 Bernoulli and Energy Equations. 6 Momentum and Analysis of Flow Systems. 7 Dimensional Analysis and Flow Systems. 8 Flow in Pipes. 9 Differential Analysis of Fluid Flow. 10 Approximations of the Navier-Stokes Equation. 11 Flow Over Bodies: Drag and Lift. 12 Compressible Flow. 13 Open-Channel Flow. 14 Turbomachinery. 15 Computational Fluid Dynamics (CFD). Appendices: 1 Property Tables and Charts (SI Units). 2 Property Tables and Charts (English Units). 3 Introduction to EES.

*International Edition*

## FUNDAMENTALS OF THERMAL-FLUID SCIENCES

### Second Edition

by Yunus A Cengel, University of Nevada—Reno and Robert H Turner, University of Nevada—Reno

2005 / 1,232 pages / Hardcover

ISBN-13: 978-0-07-297675-5 / MHID: 0-07-297675-6

(with CD/OLC Card/ Student CD/Sub Card)

ISBN-13: 978-0-07-123926-4 / MHID: 0-07-123926-X

[IE with CD/OLC]

*The book Online Learning Center offers web-based resources for instructors and students, including self-quizzing, a student study guide for thermodynamics, and Access Science. (Browse <http://www.mhhe.com/cengel>)*

The Second Edition of Fundamentals of Thermal-Fluid Sciences presents balanced coverage of the three major subject areas comprising introductory thermal-fluid engineering: thermodynamics, fluid mechanics, and heat transfer. By emphasizing the physics and underlying physical phenomena involved, the text encourages creative think, development of a deeper understanding of the subject matter, and is read with enthusiasm and interest by both students and professors.

#### NEW TO THIS EDITION

- A new chapter on Gas Mixtures and Psychrometrics discusses the properties of non-reacting ideal gas mixtures and examines common air-conditioning practices.
- A new chapter on Momentum Analysis of Flow Systems, discussing linear and angular momentum equations, has been added to the Fluid Mechanics part of the book.
- A new chapter on Dimensional Analysis and Modeling, contributed by John M. Cimbala of The Pennsylvania State University, is available as a web chapter.

- A new chapter on Fundamentals of Thermal Radiation discusses the basic concepts of radiation and radiation properties. The chapter on Radiation Heat Transfer is also retained in this edition.

In addition to the four new chapters, several new sections have been added to existing chapters, including: Accuracy, Precision, and Significant Digits; Energy and Environment; Compressibility Factor; Entropy Balance; Heat Transfer in Common Configurations; Natural Convection from Finned Surfaces and PCBs; Radiation Intensity. Beyond these new sections, in part II, seven new sections have been added along with two new chapters to provide completely revised and enhanced FLUID MECHANICS COVERAGE.

- Comprehensive problems with parametric studies have been added. These problems require students to conduct extensive parametric studies using Engineering Equation Solver (EES) or other suitable software. These problems are designated by a computer icon for easy recognition, and can be ignored if desired.

## FEATURES

- Electronic Solutions Manual. The detailed solutions for all text problems will be delivered via COSMOS, our new Complete

- Online Solution Manual Organization System. COSMOS is a database management tool geared towards assembling homework assignments, tests and quizzes.

- Exceptional homework problems—over 2,000 homework problems, including concept, review, design, computer essay, and lab-type problems, are grouped by topic for easy selection. Open-ended problem solving is encouraged and readers are given an early lead-in to design considerations. Numerous realistic economic and safety-related problems are presented to help promote cost, engineering practice, and safety awareness.

- A structured approach to problem solving is used while maintaining an informal style, giving readers a strong grounding in the concepts of engineering thermal-fluid sciences.

- EES (Engineering Equation Solver) CD-ROM packaged is free with text. EES is a powerful equation solver with built-in functions and property tables for thermodynamics and transport properties as well as automatic unit checking capability.

- Current industrial practices are highlighted by offering two applications chapters to supplement the text. Chapters on the heating and cooling of buildings and the cooling of electronic equipment are available for free download on the book website.

## CONTENTS

1 Introduction and Overview. **PART I Thermodynamics:** 2 Basic Concepts of Thermodynamics. 3 Properties of Pure Substances. 4 Energy Transfer by Heat, Work, and Mass. 5 The First Law of Thermodynamics. 6 The Second Law of Thermodynamics. 7 Entropy. 8 Power and Refrigeration Cycles. 9 Gas Mixtures and Psychrometrics. **PART II Fluid Mechanics:** 10 Basic Concepts of Fluid Mechanics. 11 Fluid Statics. 12 Bernoulli and Energy Equations. 13 Momentum Analysis of Flow Structures. 14 Flow in Pipes. 15 Flow Over Bodies: Drag and Lift. **Part III Heat Transfer:** 16 Mechanisms of Heat Transfer. 17 Steady Heat Conduction. 18 Transient Heat Conduction. 19 Forced Convection. 20 Natural Convection. 21 Fundamentals of Thermal Radiation. 22 Radiation Heat Transfer. 23 Heat Exchanges. **PART VI Appendices:** Appendix 1 Property Tables and Charts (SI Units). Appendix 1 Property Tables and Charts (English Units). Appendix 3 Introduction to EES

## International Edition

### FLUID MECHANICS

#### Ninth Edition

by Victor Streeter, retired, University of Florida; K.W. Bedford and E. Benjamin Wylie, University of Michigan

1998 / 656 pages / Hardcover

ISBN-13: 978-0-07-062537-2 / MHID: 0-07-062537-9 (Out-of-Print)

ISBN-13: 978-0-07-115600-4 / MHID: 0-07-115600-3 [IE]

#### CONTENTS

**Part 1•Fundamentals of Fluid Mechanics and Transport/1** Fluid Properties/2 Fluid Statics/3 Fluid Flow Concepts and Basic Control Volume Equations/4 Basic Governing Differential Equations/5 Dimensional Analysis and Similitude/6 Viscous Flow: Pipes and Channels/7 External Flows/8 Ideal Flow/9 Transport by Advection and Diffusion/**Part 2•Applications of Fluid Mechanics and Transport/10** Measurement/11 Turbo Machinery/12 Closed-Conduit Flow/13 Flow in Open Channels/14 Applications of Transport Phenomena

## Aerodynamics

## International Edition



### FUNDAMENTALS OF AERODYNAMICS

#### Fourth Edition

by John D Anderson, University of Maryland-College Park

2007 / 928 pages / Hardcover

ISBN-13: 978-0-07-295046-5 / MHID: 0-07-295046-3

ISBN-13: 978-0-07-125408-3 / MHID: 0-07-125408-0 [IE]

Website: <http://www.mhhe.com/anderson>

In keeping with its bestselling previous editions, Fundamentals of Aerodynamics, fourth edition, offers the most readable, interesting, and up-to-date overview of aerodynamics to be found in any text. The classic organization of the text has been preserved, with new standalone viscous flow sections at the end of various chapters to conceptualize the coverage of this topic in part 4, and complement discussion of fundamental principles in part 1, inviscid incompressible flow in part 2, and inviscid compressible flow in part 3. Historical topics, carefully developed examples, numerous illustrations, and a wide selection of chapter problems are found throughout the text to motivate and challenge students of aerodynamics. This is the most reliable up-to-date-text for students and teachers of aerodynamics. New edition will include a new support tools Aerodynamics website, including animation and simulation tools. New edition will emphasize modern methods without diminishing the study of pure theory and experiment

#### NEW TO THIS EDITION

- NEW! Self-contained viscous flow sections have been added to the end of various chapters to contextualize the topic and complement discussion of inviscid flow.

- New!! Preview boxes have been introduced at the beginning of each chapter to inform the reader in plain language what to expect from each chapter, and why the material is important and exciting.

- New worked examples and homework problems have been added to provide even more key concept practice for students.

- Historical content scattered throughout the book.

#### FEATURES

- "Design Boxes" that relate basic concepts to actual aircraft design. Strong descriptive coverage of CFD included, with additional CFD resources available of the book's web site.

- Website includes web links, animations, and additional student and instructor resources.

- Excellent writing style and integration of history and biography to show the development of aerodynamics.

- “Roadmap” feature at the beginning of every chapter provides readers with a preview of key concepts, and puts them in perspective for the student.

## CONTENTS

Part 1 Fundamental Principles: 1 Aerodynamics: Some Introductory Thoughts. 2 Aerodynamics: Some Fundamental Principles and Equations. Part 2 Inviscid, Incompressible Flow: 3 Fundamentals of Inviscid Incompressible Flow. 4 Incompressible Flow over Airfoils. 5 Incompressible Flow over Finite Wings. 6 Three-Dimensional Incompressible Flow. Part 3 Inviscid, Compressible Flow: 7 Compressible Flow: Some Preliminary Aspects. 8 Normal Shock Waves and Related Topics. 9 Oblique Shock and Expansion Waves. 10 Compressible Flow through Nozzles, Diffusers, and Wind Tunnels. 11 Subsonic Compressible Flow over Airfoils: Linear Theory. 12 Linearized Supersonic Flow. 13 Introduction to Numerical Techniques for Nonlinear Supersonic Flow. 14 Elements of Hypersonic Flow. Part 4 Viscous Flow. 15 Introduction to the Fundamental Principles and Equations of Viscous Flow. 16 Some Special Cases; Couette and Poiseuille Flows. 17 Introduction to Boundary Layers. 18 Laminar Boundary Layers. 19 Turbulent Boundary Layers. 20 Navier-Stokes Solutions: Some Examples. Appendix A Isentropic Flow Properties. Appendix B Normal Shock Properties. Appendix C Prandtl-Meyer Function and Mach Angle. Bibliography. Index.

## Computational Fluid Dynamics

*International Edition*

### COMPUTATIONAL FLUID DYNAMICS

by John Anderson, University of Maryland

1995 / 547 pages

ISBN-13: 978-0-07-001685-9 / MHID: 0-07-001685-2

ISBN-13: 978-0-07-113210-7 / MHID: 0-07-113210-4 [IE]

#### CONTENTS

**Part I: Basic Thoughts and Equations**/1 Philosophy of Computational Fluid Dynamics/2 The Governing Equations of Fluid Dynamics: Their Derivation, A Discussion of Their Physical Meaning, and A Presentation of Forms Particularly Suitable to CFD/3 Mathematical Behavior of Partial Differential Equations: The Impact on Computational Fluid Dynamics/**Part II: Basics of the Numerics**/4 Basic Aspects of Discretization/5 Grids With Appropriate Transformations/6 Some Simple CFD Techniques: A Beginning/**Part III: Some Applications**/7 Numerical Solutions of Quasi-One-Dimensional Nozzle Flows/8 Numerical Solution of A Two-Dimensional Supersonic Flow: Prandtl-Meyer Expansion Wave/9 Incompressible Couette Flow: Numerical Solution by Means of an Implicit Method and the Pressure Correction Method/10 Supersonic Flow Over a Flat Plate: Numerical Solution by Solving the Complete Navier-Stokes Equations/**Part IV: Other Topics**/11 Some Advanced Topics in Modern CFD: A Discussion/12 The Future of Computational Fluid Dynamics/Appendix A: Thomas's Algorithm for the Solution of A Tridiagonal System of Equations References

## Viscous Fluid Flow/Boundary Layer Theory

*International Edition*

### VISCOUS FLUID FLOW

#### Third Edition

by Frank White, University of Rhode Island

2006 / 640 pages / Hardcover

ISBN-13: 978-0-07-240231-5 / MHID: 0-07-240231-8

ISBN-13: 978-0-07-124493-0 / MHID: 0-07-124493-X [IE]

*The site will include general textbook information, the solutions to end-of-chapter problems and links to helpful Web sites. (Browse <http://www.engineeringcs.com>)*

Frank White's Viscous Fluid Flow, Third Edition continues to be the market leader in this course area. The text is for a senior or graduate level elective in Mechanical Engineering, and has a strong professional and international appeal. Author Frank White is has a strong reputation in the field, his book is accurate, conceptually strong, and contains excellent problem sets. A large number of the problems are new to this third edition; a rarity among senior and graduate level textbooks as advanced problems are difficult to create. The references found in the text have been updated and reflect the most current information available. Users will also be interested to find explanations of, and references to ongoing controversies and trends in this course area. Topically speaking, the text contains modern information on technological advances, such as Micro- and Nano-technology, Turbulence Modeling, Computational Fluid Dynamics (CFD), and Unsteady Boundary Layers.

#### NEW TO THIS EDITION

- Topically speaking, the text contains modern information on technological advances, such as Micro- and Nano-technology, Turbulence Modeling, Computational Fluid Dynamics (CFD), and Unsteady Boundary Layers.
- The role of Computerized Fluid Mechanics (“CFD”) in viscous fluid flow/boundary layer analysis will be described, and examples of CFD as an analysis tool will be included.
- The 3rd edition has been redesigned for a more open and attractive appearance.
- Each reference in the text reflects the most recent information available.
- A text Web site will accompany this text at <http://www.engineeringcs.com>. The site will host general textbook information, the solutions to end of chapter problems, and additional reference resources.

#### FEATURES

- Frank White has always been recognized for his engaging, and easy-to-read writing style.

#### CONTENTS

1 Preliminary Concepts. 2 Fundamental Equations of Compressible Viscous Flow. 3 Solutions of the Newtonian Viscous-Flow Equations. 4 Laminar Boundary Layers. 5 The Stability of Laminar Flows. 6 Incompressible Turbulent Mean Flow. 7 Compressible Boundary Layer Flow. Appendices: A Transport Properties of Various Newtonian Fluids. B Equations of Motion of Incompressible Newtonian Fluids in Cylindrical and Spherical Coordinates. C A Runge-Kutta Subroutine for N Simultaneous Differential Equations. Bibliography. Index

## Compressible Flow/Gas Dynamics

*International Edition*

### MODERN COMPRESSIBLE FLOW

With historical perspective

Third edition

by John D. Anderson University of Maryland—College Park

2003 / 776 pages

ISBN-13: 978-0-07-242443-0 / MHID: 0-07-242443-5

ISBN-13: 978-0-07-124136-6 / MHID: 0-07-124136-1 [IE]

*This website will have solutions to all chapter problems, additional information on Computerized Fluid Dynamics (CFD), and additional CFD applications. (Browse <http://highered.mcgraw-hill.com/sites/0072424435>)*

### CONTENTS

1 Compressible Flow - Some History and Introductory Thoughts. 2 Integral Forms of the observation Equations for Inviscid Flows. 3 One-Dimensional Flow. 4 Oblique Shock and Expansion Waves. 5 Quasi-One-Dimensional Flow. 6 Differential Conservation Equations Revisited for Inviscid Flows. 7 Unsteady Wave Motion. 8 General Conservation Equations Revisited: Velocity Potential Equation. 9 Linearized Flow. 10 Conical Flow. 11 Numerical Techniques for Steady Supersonic Flow. 12 The Time Technique With Application to Supersonic Blunt Bodies and Nozzles. 13 Three-Dimensional Flow. 14 Transonic Flow. 15 Hypersonic Flow. 16 Properties of High-Temperature Gases. 17 High-Temperature Flows: Basic Examples

*International Edition*

### COMPRESSIBLE FLUID FLOW

by Patrick Oosthuizen, Queens University and William Carscallen, National Research Council of Canada

1997 / 512 pages / Hardcover

ISBN-13: 978-0-07-048197-8 / MHID: 0-07-048197-0

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