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Students get a firm grasp on statics and mechanics of materials with this volume of the phenomenally selling SCHAUM'S OUTLINES series. This OUTLINE includes 211 detailed problems with step-by-step solutions; hundreds of additional practice problems and answers; clear explanations of the statics and mechanics of materials; understandable coverage of all relevant topics, and more. This

book covers the essential topics for a second-level course in strength of materials or mechanics of materials, with an emphasis on techniques that are useful for mechanical design. Design typically involves an initial conceptual stage during which many options are considered. At this stage, quick approximate analytical methods are crucial in determining which of the initial proposals are feasible. The ideal would be to get within 30% with a few lines of calculation. The designer also needs to develop experience as to the kinds of features in the geometry or the loading that are most likely to lead to critical conditions. With this in mind, the author tries wherever possible to give a physical and even an intuitive interpretation to the problems under investigation. For example, students are encouraged to estimate the location of weak and strong bending axes and the resulting neutral axis of bending before performing calculations, and the author discusses ways of getting good accuracy with a simple one degree of freedom Rayleigh-Ritz approximation. Students are also encouraged to develop a feeling for structural deformation by performing simple experiments in their outside environment, such as estimating the radius to which an initially straight bar can be bent without producing permanent deformation, or convincing themselves of the dramatic difference between torsional and bending stiffness for a thin-walled open beam section by

trying to bend and then twist a structural steel beam by hand-applied loads at one end. In choosing dimensions for mechanical components, designers will expect to be guided by criteria of minimum weight, which with elementary calculations, generally leads to a thin-walled structure as an optimal solution. This consideration motivates the emphasis on thin-walled structures, but also demands that students be introduced to the limits imposed by structural instability. Emphasis is also placed on the effect of manufacturing errors on such highly-designed structures - for example, the effect of load misalignment on a beam with a large ratio between principal stiffness and the large magnification of initial alignment or loading errors in a strut below, but not too far below the buckling load. Additional material can be found on <http://extras.springer.com/> . For the past forty years Beer and Johnston have been the uncontested leaders in the teaching of undergraduate engineering mechanics. Their careful presentation of content, unmatched levels of accuracy, and attention to detail have made their texts the standard for excellence. The revision of their classic Mechanics of Materials text features a new and updated design and art program; almost every homework problem is new or revised; and extensive content revisions and text reorganizations have been made. The multimedia supplement package includes

an extensive strength of materials Interactive Tutorial (created by George Staab and Brooks Breedon of The Ohio State University) to provide students with additional help on key concepts, and a custom book website offers online resources for both instructors and students. For core Introductory Statics and Mechanics of Materials courses found in mechanical, civil, aeronautical, or engineering mechanics departments. This text presents the foundations and applications of statics and mechanics of materials by emphasizing the importance of visual analysis of topics—especially through the use of free body diagrams. It also promotes a problem-solving approach to solving examples through its strategy, solution, and discussion format in examples. The authors further include design and computational examples that help instructors integrate these ABET 2000 requirements. The well-regarded materials science textbook, updated for enhanced learning and current content *Mechanics of Materials: An Integrated Learning System, 5th Edition* helps engineering students visualize how materials move and change better than any other course available. This text focuses on helping learners develop practical skills, encouraging them to recognize fundamental concepts relevant to specific situations, identify equations needed to solve problems, and engage critically with literature in the field. In this new edition, hundreds of new

problems—including over 200 problems with video solutions—have been added to enhance the flexibility and robustness of the course. With WileyPLUS, this course contains a rich selection of online content and interactive materials, including animations, tutorial videos, and worked problems—many of which are new and expanded in this 5th Edition. An emphasis on critical thinking forms the foundation of *Mechanics of Materials* in this revised edition. From basic concepts of stress and strain to more advanced topics like beam deflections and combined loads, this book provides students with everything they need to embark on successful careers in materials and mechanical engineering. Introduces students to the core concepts of material mechanics and presents the latest methods and current problems in the field Adds hundreds of new and revised problems, 200+ new video solutions, and over 400 new EQAT coded algorithmic problems Emphasizes practical skills and critical thinking, encouraging learners to devise effective methods of solving example problems Contains updates and revisions to reflect the current state of the discipline and to enhance the breadth of course content Includes access to interactive animations, demonstration videos, and step-by-step problem solutions with WileyPLUS online environment With added flexibility and opportunities for course customization, *Mechanics of Materials*

provides excellent value for instructors and students alike. Learners will stay engaged and on track, gaining a solid and lasting understanding of the subject matter. This text is designed for a first course in mechanics of deformable bodies; it presents the concepts and skills that form the foundation of all structural analysis and machine design. Presentation relies on free-body diagrams, application of the equations of equilibrium, visualization and use of the geometry of the deformed body, and use of the relations between stresses and strains for the material being used. Includes many illustrative examples and homework problems. Also contains computer problems and an appendix on computer methods. This book, framed in the processes of engineering analysis and design, presents concepts in mechanics of materials for students in two-year or four-year programs in engineering technology, architecture, and building construction; as well as for students in vocational schools and technical institutes. Using the principles and laws of mechanics, physics, and the fundamentals of engineering, *Mechanics of Materials: An Introduction for Engineering Technology* will help aspiring and practicing engineers and engineering technicians from across disciplines—mechanical, civil, chemical, and electrical—apply concepts of engineering mechanics for analysis and design of materials, structures, and machine components. The book

is ideal for those seeking a rigorous, algebra/trigonometry-based text on the mechanics of materials. 4. 2 Solid Circular Shafts-Angle of Twist and Shearing Stresses 159 4. 3 Hollow Circular Shafts-Angle of Twist and Shearing Stresses 166 4. 4 Principal Stresses and Strains Associated with Torsion 173 4. 5 Analytical and Experimental Solutions for Torsion of Members of Noncircular Cross Sections 179 4. 6 Shearing Stress-Strain Properties 188 *4. 7 Computer Applications 195 5 Stresses in Beams 198 5. 1 Introduction 198 5. 2 Review of Properties of Areas 198 5. 3 Flexural Stresses due to Symmetric Bending of Beams 211 5. 4 Shear Stresses in Symmetrically Loaded Beams 230 *5. 5 Flexural Stresses due to Unsymmetric Bending of Beams 248 *5. 6 Computer Applications 258 Deflections of Beams 265 I 6. 1 Introduction 265 6. 2 Moment-Curvature Relationship 266 6. 3 Beam Deflections-Two Successive Integrations 268 6. 4 Derivatives of the Elastic Curve Equation and Their Physical Significance 280 6. 5 Beam Deflections-The Method of Superposition 290 6. 6 Construction of Moment Diagrams by Cantilever Parts 299 6. 7 Beam Deflections-The Area-Moment Method 302 *6. 8 Beam Deflections-Singularity Functions 319 *6. 9 Beam Deflections-Castigliano's Second Theorem 324 *6. 10 Computer Applications 332 7 Combined Stresses and Theories of Failure 336 7. 1 Introduction 336 7. 2 Axial and Torsional Stresses 336 Axial

and Flexural Stresses 342 7. 3 Torsional and Flexural Stresses 352 7. 4 7. 5 Torsional, Flexural, and Axial Stresses 358 *7. 6 Theories of Failure 365 Computer Applications 378 *7. Your ticket to excelling in mechanics of materials With roots in physics and mathematics, engineering mechanics is the basis of all the mechanical sciences: civil engineering, materials science and engineering, mechanical engineering, and aeronautical and aerospace engineering. Tracking a typical undergraduate course, Mechanics of Materials For Dummies gives you a thorough introduction to this foundational subject. You'll get clear, plain-English explanations of all the topics covered, including principles of equilibrium, geometric compatibility, and material behavior; stress and its relation to force and movement; strain and its relation to displacement; elasticity and plasticity; fatigue and fracture; failure modes; application to simple engineering structures, and more. Tracks to a course that is a prerequisite for most engineering majors Covers key mechanics concepts, summaries of useful equations, and helpful tips From geometric principles to solving complex equations, Mechanics of Materials For Dummies is an invaluable resource for engineering students! This book is the first to bridge the often disparate bodies of knowledge now known as applied mechanics and materials science. Using a very methodological process to

introduce mechanics, materials, and design issues in a manner called "total structural design", this book seeks a solution in "total design space" Features include: * A generalized design template for solving structural design problems. * Every chapter first introduces mechanics concepts through deformation, equilibrium, and energy considerations. Then the constitutive nature of the chapter topic is presented, followed by a link between mechanics and materials concepts. Details of analysis and materials selection are subsequently discussed. * A concluding example design problem is provided in most chapters, so that students may get a sense of how mechanics and materials come together in the design of a real structure. * Exercises are provided that are germane to aerospace, civil, and mechanical engineering applications, and include both deterministic and design-type problems. * Accompanying website contains a wealth of information complementary to this text, including a set of virtual labs. Separate site areas are available for the instructor and students. Combines theories of solid mechanics, materials science and structural design in one coherent text/reference Covers physical scales from the atomistic to continuum mechanics Offers a generalized structural design template The fourth edition of Mechanics of Materials is an in-depth yet accessible introduction to the behavior of solid materials under various stresses and

strains. Emphasizing the three key concepts of deformable-body mechanics—equilibrium, material behavior, and geometry of deformation—this popular textbook covers the fundamental concepts of the subject while helping students strengthen their problem-solving skills. Throughout the text, students are taught to apply an effective four-step methodology to solve numerous example problems and understand the underlying principles of each application. Focusing primarily on the behavior of solids under static-loading conditions, the text thoroughly prepares students for subsequent courses in solids and structures involving more complex engineering analyses and Computer-Aided Engineering (CAE). The text provides ample, fully solved practice problems, real-world engineering examples, the equations that correspond to each concept, chapter summaries, procedure lists, illustrations, flow charts, diagrams, and more. This updated edition includes new Python computer code examples, problems, and homework assignments that require only basic programming knowledge. This systematic exploration of real-world stress analysis has been completely updated to reflect state-of-the-art methods and applications now used in aeronautical, civil, and mechanical engineering, and engineering mechanics. Distinguished by its exceptional visual interpretations of solutions, *Advanced Mechanics of Materials and Applied*

Elasticity offers in-depth coverage for both students and engineers. The authors carefully balance comprehensive treatments of solid mechanics, elasticity, and computer-oriented numerical methods—preparing readers for both advanced study and professional practice in design and analysis. This major revision contains many new, fully reworked, illustrative examples and an updated problem set—including many problems taken directly from modern practice. It offers extensive content improvements throughout, beginning with an all-new introductory chapter on the fundamentals of materials mechanics and elasticity. Readers will find new and updated coverage of plastic behavior, three-dimensional Mohr's circles, energy and variational methods, materials, beams, failure criteria, fracture mechanics, compound cylinders, shrink fits, buckling of stepped columns, common shell types, and many other topics. The authors present significantly expanded and updated coverage of stress concentration factors and contact stress developments. Finally, they fully introduce computer-oriented approaches in a comprehensive new chapter on the finite element method. Gives a clear and thorough presentation of the fundamental principles of mechanics and strength of materials. Provides both the theory and applications of mechanics of materials on an intermediate theoretical level. Useful as a reference tool by

postgraduates and researchers in the fields of solid mechanics as well as practicing engineers. Now in its second English edition, *Mechanics of Materials* is the second volume of a three-volume textbook series on Engineering Mechanics. It was written with the intention of presenting to engineering students the basic concepts and principles of mechanics in as simple a form as the subject allows. A second objective of this book is to guide the students in their efforts to solve problems in mechanics in a systematic manner. The simple approach to the theory of mechanics allows for the different educational backgrounds of the students. Another aim of this book is to provide engineering students as well as practising engineers with a basis to help them bridge the gaps between undergraduate studies, advanced courses on mechanics and practical engineering problems. The book contains numerous examples and their solutions. Emphasis is placed upon student participation in solving the problems. The new edition is fully revised and supplemented by additional examples. The contents of the book correspond to the topics normally covered in courses on basic engineering mechanics at universities and colleges. Volume 1 deals with Statics and Volume 3 treats Particle Dynamics and Rigid Body Dynamics. Separate books with exercises and well elaborated solutions are available. For a one/two-semester upper-level undergraduate/graduate-level

second course in Mechanics of Materials. This text covers all topics usually treated in an advanced mechanics of materials course. Throughout, topics are treated by extending concepts and procedures of elementary mechanics of materials, assisted when necessary by advanced methods such as theory of elasticity. ABOUT THE BOOK Beer and Johnston's Mechanics of Materials is the uncontested leader for the teaching of solid mechanics. Used by thousands of students around the globe since publication, Mechanics of Materials, provides a precise presentation of the subject illustrated with numerous engineering examples that students both understand and relate to theory and application. The tried and true methodology for presenting material gives your student the best opportunity to succeed in this course. From the detailed examples, to the homework problems, to the carefully developed solutions manual, you and your students can be confident the material is clearly explained and accurately represented. McGraw-Hill is proud to offer Connect with the seventh edition of Beer and Johnston's Mechanics of Materials. This innovative and powerful system helps your students learn more effectively and gives you the ability to assign homework problems simply and easily. Problems are graded automatically, and the results are recorded immediately. Track individual student performance - by question, assignment, or in relation to the class overall

with detailed grade reports. ConnectPlus provides students with all the advantages of Connect, plus 24/7 access to an eBook Beer and Johnston's Mechanics of Materials, seventh edition, includes the power of McGraw-Hill's LearnSmart--a proven adaptive learning system that helps students learn faster, study more efficiently, and retain more knowledge through a series of adaptive questions. This innovative study tool pinpoints concepts the student does not understand and maps out a personalized plan for success. Connect Engineering is currently offered to support the U.S. edition which contains both imperial and metric units. For more information about Connect, please contact your sales representative. New to this edition: Connect is available with the seventh edition of Beer and Johnston, Mechanics of Materials. This innovative and powerful new system helps your students learn more efficiently and gives you the ability to assign homework problems simply and easily. Problems are graded automatically, and the results are recorded immediately. Track individual student performance--by question, assignment, or in relation to the class overall with detailed grade reports. ConnectPlus provides students with all the advantages of Connect, plus 24/7 access to an eBook. McGraw-Hill's LearnSmart is a proven adaptive learning program that helps students learn faster, study more efficiently, and retain more knowledge through a series of

adaptive questions. This innovative study tool pinpoints concepts the student does not understand and maps out a personalized plan for success. S.M.A.R.T. Problem-Solving Method In this edition, Mechanics of Materials example problems are solved using S.M.A.R.T--Strategy, Modeling, Analysis, Reflect, and Think. This concrete strategy helps students build a strong set of habits for successful completion and execution of the course's many problems. For undergraduate mechanics of materials courses in mechanical, civil, and aerospace engineering departments, the new four-colour, photo realistic art program featured in this edition helps students better visualize concepts. For courses in introductory combined Statics and Mechanics of Materials courses found in ME, CE, AE, and Engineering Mechanics departments. Statics and Mechanics of Materials represents a combined abridged version of two of the author's books, namely Engineering Mechanics: Statics, Fourteenth Edition and Mechanics of Materials, Tenth Edition with Statics and Mechanics of Materials represents a combined abridged version of two of the author's books, namely Engineering Mechanics: Statics, Fourteenth Edition in SI Units and Mechanics of Materials, Tenth Edition in SI Units. It provides a clear and thorough presentation of both the theory and application of the important fundamental topics

of these subjects that are often used in many engineering disciplines. The development emphasises the importance of satisfying equilibrium, compatibility of deformation, and material behavior requirements. The hallmark of the book, however, remains the same as the author's unabridged versions, and that is, strong emphasis is placed on drawing a free-body diagram, and the importance of selecting an appropriate coordinate system and an associated sign convention whenever the equations of mechanics are applied. Throughout the book, many analysis and design applications are presented, which involve mechanical elements and structural members often encountered in engineering practice.

Mechanics of Materials: With Applications in Excel® covers the fundamentals of the mechanics of materials—or strength of materials—in a clear and easily understandable way. Each chapter explains the theory of the underlying principles and the applicable mathematical relations, offering examples that illustrate the application of the mathematical relations to physical situations. Then, homework problems—arranged from the simplest to the most demanding—are presented, along with a number of challenging review problems, to ensure comprehension of key concepts. What makes this book unique is that it also instills practical skills for developing Microsoft Excel applications to solve mechanics of materials problems using

numerical techniques. Mechanics of Materials: With Applications in Excel® provides editable Excel spreadsheets representing all the examples featured in the text, PowerPoint lecture slides, multimedia simulations, graphics files, and a solutions manual with qualifying course adoption. One of the most important subjects for any student of engineering or materials to master is the behaviour of materials and structures under load. The way in which they react to applied forces, the deflections resulting and the stresses and strains set up in the bodies concerned are all vital considerations when designing a mechanical component such that it will not fail under predicted load during its service lifetime. Building upon the fundamentals established in the introductory volume Mechanics of Materials 1, this book extends the scope of material covered into more complex areas such as unsymmetrical bending, loading and deflection of struts, rings, discs, cylinders plates, diaphragms and thin walled sections. There is a new treatment of the Finite Element Method of analysis, and more advanced topics such as contact and residual stresses, stress concentrations, fatigue, creep and fracture are also covered. Each chapter contains a summary of the essential formulae which are developed in the chapter, and a large number of worked examples which progress in level of difficulty as the principles are enlarged upon. In addition,

each chapter concludes with an extensive selection of problems for solution by the student, mostly examination questions from professional and academic bodies, which are graded according to difficulty and furnished with answers at the end. KEY BENEFIT: "Mechanics of Materials" presents the foundations and applications of mechanics of materials by emphasizing the importance of visual analysis of topics--especially through the use of free body diagrams. The book also promotes a problem-solving approach to solving examples through its strategy, solution, and discussion format in examples. Provides a problem-solving approach. Emphasizes visual analysis of topics in all examples. Includes motivating applications throughout the book. Ideal for readers wanting to learn more about mechanical, civil, aerospace, engineering mechanics, and/or general engineering. This book contains the most important formulas and more than 140 completely solved problems from Mechanics of Materials and Hydrostatics. It provides engineering students material to improve their skills and helps to gain experience in solving engineering problems. Particular emphasis is placed on finding the solution path and formulating the basic equations. Topics include: - Stress - Strain - Hooke's Law - Tension and Compression in Bars - Bending of Beams - Torsion - Energy Methods - Buckling of Bars - Hydrostatics Applications of the principles of mechanics of materials have

increased considerably over the last 25 years. Today's routine industrial practices and techniques were only esoteric research topics just a few years ago. That research is now relevant to such diverse but commonplace applications as electronic packaging, medical implantation, geology (seismic prediction), and engineered wood products. It is in this rapidly changing world that Madhukar Vable's *Mechanics of Materials* takes its place as a standard text for civil, mechanical, and aerospace engineering majors, as well as for any other engineering discipline that includes mechanics of materials as a basic course. Vable's distinct pedagogical approach translates into exceptional features that enhance student participation in learning. It assumes a complementary connection between intuition, experimental observation, and mathematical generalization, suggesting that intuitive development and understanding need not be at odds with mathematical logic, rigor, and generalization. This approach also emphasizes engineering practice without distracting from the main point of the text. With strong practical examples and real-life engineering problems praised by reviewers, *Mechanics of Materials* promises to provide the skills and principles that students need to organize, integrate, and make sense of the flood of information emerging in the world of modern engineering.

Pedagogical Features

Overview: Each chapter begins

with a concise Overview that describes the motivation and major learning objective behind the chapter.

- **Points and Formulas to Remember:** Each chapter ends with a convenient one-page synopsis of essential topics.
- **Plans and Comments:** Every example starts with a Plan for solving the problem and ends with Comments that connect the example with previous and future concepts in the text, putting examples firmly into context within the field of mechanics.
- **Quick Tests:** Quick Tests help students effectively diagnose their own understanding of text material.
- **Consolidate Your Knowledge:** These boxes follow major topics and prompt students to write a synopsis of or derive a formula for material just covered, encouraging development of personal reasoning skills.
- **General Information:** These intriguing sections connect historical development and advanced topics to material in each chapter.
- **"Stretch Yourself":** Problems labeled "Stretch Yourself" contain important reference material that will be useful to students as future engineers.
- **Closure:** Every chapter closes with helpful links to topics in subsequent chapters.
- **Formula Sheet:** These useful sheets are found inside the back cover of the book for easy reference. They list equations of essential topics but include no explanations of variables and equations, making them perfect for use during exams. By emphasizing the three key concepts of mechanics of solids, this new edition helps

engineers improve their problem-solving skills. They'll discover how these fundamental concepts underlie all of the applications presented, and they'll learn how to identify the equations needed to solve various problems. New discussions are included on literature reviews, focusing on the literature review found in proposals and research articles. Groupware communication tools including blogs, wikis and meeting applications are covered. More information is also presented on transmittal letters and PowerPoint style presentations. And with the addition of detailed example problems, engineers will learn how to organize their solutions. At McGraw-Hill, we believe Beer and Johnston's *Mechanics of Materials* is the uncontested leader for the teaching of solid mechanics. Used by thousands of students around the globe since its publication in 1981, *Mechanics of Materials*, provides a precise presentation of the subject illustrated with numerous engineering examples that students both understand and relate to theory and application. The tried and true methodology for presenting material gives your student the best opportunity to succeed in this course. From the detailed examples, to the homework problems, to the carefully developed solutions manual, you and your students can be confident the material is clearly explained and accurately represented. If you want the best book for your students, we feel Beer, Johnston's *Mechanics of*

Materials, 5th edition is your only choice. The Eighth Edition of MECHANICS OF MATERIALS continues its tradition as one of the leading texts on the market. With its hallmark clarity and accuracy, this text develops student understanding along with analytical and problem-solving skills. The main topics include analysis and design of structural members subjected to tension, compression, torsion, bending, and more. The book includes more material than can be taught in a single course giving instructors the opportunity to select the topics they wish to cover while leaving any remaining material as a valuable student reference. Important Notice: Media content referenced within the product description or the product text may not be available in the ebook version. This textbook covers the fundamental principles and applications and discusses topics, such as, simple and compound stresses, bending moments, shear forces, stresses in beams, deflection in beams, torsion of shafts, thick and thin cylinders, and columns and struts. Beer and Johnston's Mechanics of Materials is the uncontested leader for the teaching of solid mechanics. Used by thousands of students around the globe since its publication in 1981, Mechanics of Materials, provides a precise presentation of the subject illustrated with numerous engineering examples that students both understand and relate to theory and application. The tried and true

methodology for presenting material gives your student the best opportunity to succeed in this course. From the detailed examples, to the homework problems, to the carefully developed solutions manual, you and your students can be confident the material is clearly explained and accurately represented. If you want the best book for your students, we feel Beer, Johnston's Mechanics of Materials, 6th edition is your only choice. Master two essential subjects in engineering mechanics--statics and mechanics of materials--with the rigorous, complete, and integrated treatment found in STATICS AND MECHANICS OF MATERIALS. This practical text helps you establish a strong foundation for further study in mechanics that is essential whether you continue in mechanical, structural, civil, biomedical, petroleum, nuclear, aeronautical, or aerospace engineering. The authors present numerous practical problems based on real structures, using state-of-the-art graphics, photograph, and detailed drawings of freebody diagrams. All example problems and end-of-chapter problems follow a comprehensive, organized, and systematic Four-Step Problem-Solving Approach to help you strengthen important problem-solving skills and gain new insight into methods for dissecting and solving problems. This free website also contains nearly 200 FE-type review problems to help prepare you for success on the FE Exams. Important Notice:

Media content referenced within the product description or the product text may not be available in the ebook version. This text provides a clear, comprehensive presentation of both the theory and applications of mechanics of materials. The text examines the physical behaviour of materials under load, then proceeds to model this behaviour to development theory. The contents of each chapter are organized into well-defined units that allow instructors great flexibility in course emphasis. writing style, cohesive organization, and exercises, examples, and free body diagrams to help prepare tomorrow's engineers. The book contains over 1,700 homework problems depicting realistic situations students are likely to encounter as engineers. These illustrated problems are designed to stimulate student interest and enable them to reduce problems from a physical description to a model or symbolic representation to which the theoretical principles may be applied. The problems balance FPS and SI units and are arranged in an increasing order of difficulty so students can evaluate their understanding of the material. This 2006 book combines modern and traditional solid mechanics topics in a coherent theoretical framework. This book covers the essential topics for a second-level course in strength of materials or mechanics of materials, with an emphasis on techniques that are useful for mechanical design. Design typically

involves an initial conceptual stage during which many options are considered. At this stage, quick approximate analytical methods are crucial in determining which of the initial proposals are feasible. The ideal would be to get within 30% with a few lines of calculation. The designer also needs to develop experience as to the kinds of features in the geometry or the loading that are most likely to lead to critical conditions. With this in mind, the author tries wherever possible to give a physical and even an intuitive interpretation to the problems under investigation. For example, students are encouraged to estimate the location of weak and strong bending axes and the resulting neutral axis of bending before performing calculations, and the author discusses ways of getting good accuracy with a simple one degree of freedom Rayleigh-Ritz approximation. Students are also encouraged to develop a feeling for structural deformation by performing simple experiments in their outside environment, such as estimating the radius to which an initially straight bar can be bent without producing permanent deformation, or convincing themselves of the dramatic difference between torsional and bending stiffness for a thin-walled open beam section by trying to bend and then twist a structural steel beam by hand-applied loads at one end. In choosing dimensions for mechanical components, designers will expect to be guided by criteria of minimum

weight, which with elementary calculations, generally leads to a thin-walled structure as an optimal solution. This consideration motivates the emphasis on thin-walled structures, but also demands that students be introduced to the limits imposed by structural instability. Emphasis is also placed on the effect of manufacturing errors on such highly-designed structures - for example, the effect of load misalignment on a beam with a large ratio between principal stiffness and the large magnification of initial alignment or loading errors in a strut below, but not too far below the buckling load. Additional material can be found on <http://extras.springer.com/>. The full text downloaded to your computer With eBooks you can: search for key concepts, words and phrases make highlights and notes as you study share your notes with friends eBooks are downloaded to your computer and accessible either offline through the Bookshelf (available as a free download), available online and also via the iPad and Android apps. Upon purchase, you'll gain instant access to this eBook. Time limit The eBooks products do not have an expiry date. You will continue to access your digital ebook products whilst you have your Bookshelf installed. Thorough coverage, a highly visual presentation, and increased problem solving from an author you trust. Mechanics of Materials clearly and thoroughly presents the theory and supports the application of

essential mechanics of materials principles. Professor Hibbeler's concise writing style, countless examples, and stunning four-colour photorealistic art program — all shaped by the comments and suggestions of hundreds of colleagues and students — help students visualise and master difficult concepts. The Tenth SI Edition retains the hallmark features synonymous with the Hibbeler franchise, but has been enhanced with the most current information, a fresh new layout, added problem solving, and increased flexibility in the way topics are covered in class. * Use of Free-Body Diagrams. Authors, Riley, Sturges and Morris, feel that a proper free-body diagram is very important in all mechanics courses. Whenever an equation of equilibrium is written, a complete, proper free-body diagram accompanies it. * Problem Solving Procedures. Statics and Mechanics of Materials: An Integrated Approach provides students with an effective methodology for problem decomposition and solution, the ability to present results in a clear, and logical manner is emphasized throughout the text. * Homework Problems. Over 1100 homework problems allow for varied problem assignments. Each set of problems represents a range of difficulty and is grouped according to this range of difficulty. * SI vs. U.S. Customary Units are used in equal proportions in the text for both example and homework problems.

