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An Introduction to the Finite Element Method An Introduction to Continuum Mechanics Extended Finite Element Method Applied Functional Analysis and Variational Methods in Engineering Introductory Functional Analysis TEXTBOOK OF FINITE ELEMENT ANALYSIS Numerical Solution of Partial Differential Equations by the Finite Element Method Mechanics of Solids and Structures, Second Edition Energy Principles and Variational Methods in Applied Mechanics Solutions Manual for Theory and Analysis of Elastic Plates and Shells, Second Edition Introduction to Continuum Mechanics Principles of Continuum Mechanics Student Solutions Manual for Physical Chemistry Applied Data Analysis and Modeling for Energy Engineers and Scientists Introduction to the Finite Element Method 4E Protective Relaying The Finite Element Method for Boundary Value Problems Essentials of Offshore Structures Mechanics of Composite Materials with MATLAB Variational Methods in Theoretical Mechanics Essentials of Electronic Testing for Digital, Memory and Mixed-Signal VLSI Circuits Theory and Analysis of Elastic Plates and Shells, Second Edition Symmetry and Spectroscopy of Molecules MATLAB Codes for Finite Element Analysis Advanced Engineering Analysis Machine Drawing Principles of Continuum Mechanics API Design for C++ C++ Programming: From Problem Analysis to Program Design Fundamentals of Structural Dynamics Distributed and Cloud Computing Antennas and Propagation for Wireless Communication Systems Solutions Manual to a First Course in Fuzzy Logic Magnetism in Condensed Matter CONTROL SYSTEMS Sustainable Engineering Principles of Continuum Mechanics Probabilistic Machine Learning Concepts in Federal Taxation 2016 Mechanics of Solids

Continuum mechanics deals with the stress, deformation, and mechanical behaviour of matter as a continuum rather than a collection of discrete particles. The subject is interdisciplinary in nature, and has gained increased attention in recent times primarily because of a need to understand a variety of phenomena at different spatial scales. The second edition of Principles of Continuum Mechanics provides a concise yet rigorous treatment of the subject of continuum mechanics and elasticity at the senior undergraduate and first-year graduate levels. It prepares engineer-scientists for advanced courses in traditional as well as emerging fields such as biotechnology, nanotechnology, energy systems, and computational mechanics. The large number of examples and exercise problems contained in the book systematically advance the understanding of vector and tensor analysis, basic kinematics, balance laws, field equations, constitutive equations, and applications. A solutions manual is available for the book. Introduces the theory and applications of the extended finite element method (XFEM) in the linear and nonlinear problems of continua, structures and geomechanics Explores the concept of partition of unity, various enrichment functions, and fundamentals of XFEM formulation. Covers numerous applications of XFEM including fracture mechanics, large deformation, plasticity, multiphase flow, hydraulic fracturing and contact problems Accompanied by a website hosting source code and examples A popular text in its first edition, Mechanics of Solids and Structures serves as a course text for the senior/graduate (fourth or fifth year) courses/modules in the mechanics of solid/advanced strength of materials, offered in aerospace, civil, engineering science, and mechanical engineering departments. Now, Mechanics of Solid and Structure, Second Edition presents the latest developments in computational methods that have revolutionized the field, while retaining all of the basic principles and foundational information needed for mastering advanced engineering mechanics. Key changes to the second edition include full-color illustrations throughout, web-based computational material, and the addition of a new chapter on the energy methods of structural mechanics. Using authoritative, yet accessible language, the authors explain the construction of expressions for both total potential energy and complementary potential energy associated with structures. They explore how the principles of minimal total potential energy and complementary energy provide the means to obtain governing equations of the structure, as well as a means to determine point forces and displacements with ease using Castigliano's Theorems I and II. The material presented in this chapter also provides a deeper understanding of the finite element method, the most popular method for solving structural mechanics problems. Integrating computer techniques and programs into the body of the text, all chapters offer exercise problems for further understanding. Several appendices provide examples, answers to select problems, and opportunities for investigation into complementary topics. Listings of computer programs discussed are available on the CRC Press website. An accessible introduction to the finite element method for solving numeric problems, this volume offers the keys to an important technique in computational mathematics. Suitable for advanced undergraduate and graduate courses, it

outlines clear connections with applications and considers numerous examples from a variety of science- and engineering-related specialties. This text encompasses all varieties of the basic linear partial differential equations, including elliptic, parabolic and hyperbolic problems, as well as stationary and time-dependent problems. Additional topics include finite element methods for integral equations, an introduction to nonlinear problems, and considerations of unique developments of finite element techniques related to parabolic problems, including methods for automatic time step control. The relevant mathematics are expressed in non-technical terms whenever possible, in the interests of keeping the treatment accessible to a majority of students. Now readers can master all aspects of federal taxation with the distinctive, balanced conceptual approach found only in Murphy/Higgins' CONCEPTS IN FEDERAL TAXATION 2016. This unique text presents taxation as a small number of unifying concepts. Readers master these concepts before applying them to specific tax rules and everyday economics. This edition presents today's latest tax laws and changes for the most recent tax year in a clear, straightforward manner without overwhelming technical detail. For further clarity the text introduces individual taxation before addressing more complex business entities. The book's small, manageable segments with Concept Checks are ideal for CPA Exam review. This text balances tax concepts with the Internal Revenue Code to prepare readers for success on CPA Exam tax simulations and within their careers. Frequent examples relate tax concepts to familiar contemporary business scenarios. This edition provides more practice exercises than any other book of its kind. CONCEPTS IN FEDERAL TAXATION 2016 will provide a conceptual understanding of taxation like no other text. Important Notice: Media content referenced within the product description or the product text may not be available in the ebook version. This comprehensive text on control systems is designed for undergraduate students pursuing courses in electronics and communication engineering, electrical and electronics engineering, telecommunication engineering, electronics and instrumentation engineering, mechanical engineering, and biomedical engineering. Appropriate for self-study, the book will also be useful for AMIE and IETE students. Written in a student-friendly readable manner, the book, now in its Second Edition, explains the basic fundamentals and concepts of control systems in a clearly understandable form. It is a balanced survey of theory aimed to provide the students with an in-depth insight into system behaviour and control of continuous-time control systems. All the solved and unsolved problems in this book are classroom tested, designed to illustrate the topics in a clear and thorough way. NEW TO THIS EDITION • One new chapter on Digital control systems • Complete answers with figures • Root locus plots and Nyquist plots redrawn as per MATLAB output • MATLAB programs at the end of each chapter • Glossary at the end of chapters KEY FEATURES • Includes several fully worked-out examples to help students master the concepts involved. • Provides short questions with answers at the end of each chapter to help students prepare for exams confidently. • Offers fill in the blanks and objective type questions with answers at the end of each chapter to quiz students on key learning points. • Gives chapter-end review questions and problems to assist students in reinforcing their knowledge. Solution Manual is available for adopting faculty. This is a textbook written for use in a graduate-level course for students of mechanics and engineering science. It is designed to cover the essential features of modern variational methods and to demonstrate how a number of basic mathematical concepts can be used to produce a unified theory of variational mechanics. As prerequisite to using this text, we assume that the student is equipped with an introductory course in functional analysis at a level roughly equal to that covered, for example, in Kolmogorov and Fomin (Functional Analysis, Vol. I, Graylock, Rochester, 1957) and possibly a graduate-level course in continuum mechanics. Numerous references to supplementary material are listed throughout the book. We are indebted to Professor Jim Douglas of the University of Chicago, who read an earlier version of the manuscript and whose detailed suggestions were extremely helpful in preparing the final draft. He also gratefully acknowledge that much of our own research work on variational theory was supported by the U.S. Air Force Office of Scientific Research. He are indebted to Mr. Ming-Goei Sheu for help in proofreading. Finally, we wish to express thanks to Mrs. Marilyn Gude for her excellent and pains taking job of typing the manuscript. J. T. ODEN J. N. REDDY Table of Contents PREFACE 1. INTRODUCTION 1.1 The Role of Variational Theory in Mechanics. 1 1.2 Some Historical Comments 2 1.3 Plan of Study 5 7 2. MATHEMATICAL FOUNDATIONS OF CLASSICAL VARIATIONAL THEORY 7 2.1 Introduction This book intend to supply readers with some MATLAB codes for finite element analysis of solids and structures. After a short introduction to MATLAB, the book illustrates the finite element implementation of some problems by simple scripts and functions. The following problems are discussed: • Discrete systems, such as springs and bars • Beams and frames in bending in 2D and 3D • Plane stress problems • Plates in bending • Free vibration of Timoshenko beams and Mindlin plates, including laminated composites • Buckling of Timoshenko beams and Mindlin plates The book does not intends to give a deep insight into the finite element details, just the basic equations so that the user can modify the codes. The book was prepared for undergraduate science and engineering students, although it may be useful for graduate students. The MATLAB codes of this book are included in the disk. Readers are welcomed to use them freely. The author does not guarantee that the codes are error-free, although a major effort was taken to verify all of them. Users should use MATLAB 7.0 or greater when running these codes. Any suggestions or corrections are welcomed by an email to

ferreira@fe.up.pt. Introduction to Continuum Mechanics is a recently updated and revised text which is perfect for either introductory courses in an undergraduate engineering curriculum or for a beginning graduate course. Continuum Mechanics studies the response of materials to different loading conditions. The concept of tensors is introduced through the idea of linear transformation in a self-contained chapter, and the interrelation of direct notation, indicial notation, and matrix operations is clearly presented. A wide range of idealized materials are considered through simple static and dynamic problems, and the book contains an abundance of illustrative examples of problems, many with solutions. Serves as either a introductory undergraduate course or a beginning graduate course textbook. Includes many problems with illustrations and answers.

API Design for C++ provides a comprehensive discussion of Application Programming Interface (API) development, from initial design through implementation, testing, documentation, release, versioning, maintenance, and deprecation. It is the only book that teaches the strategies of C++ API development, including interface design, versioning, scripting, and plug-in extensibility. Drawing from the author's experience on large scale, collaborative software projects, the text offers practical techniques of API design that produce robust code for the long term. It presents patterns and practices that provide real value to individual developers as well as organizations. API Design for C++ explores often overlooked issues, both technical and non-technical, contributing to successful design decisions that product high quality, robust, and long-lived APIs. It focuses on various API styles and patterns that will allow you to produce elegant and durable libraries. A discussion on testing strategies concentrates on automated API testing techniques rather than attempting to include end-user application testing techniques such as GUI testing, system testing, or manual testing. Each concept is illustrated with extensive C++ code examples, and fully functional examples and working source code for experimentation are available online. This book will be helpful to new programmers who understand the fundamentals of C++ and who want to advance their design skills, as well as to senior engineers and software architects seeking to gain new expertise to complement their existing talents. Three specific groups of readers are targeted: practicing software engineers and architects, technical managers, and students and educators. The only book that teaches the strategies of C++ API development, including design, versioning, documentation, testing, scripting, and extensibility. Extensive code examples illustrate each concept, with fully functional examples and working source code for experimentation available online. Covers various API styles and patterns with a focus on practical and efficient designs for large-scale long-term projects. A comprehensive guide to using energy principles and variational methods for solving problems in solid mechanics This book provides a systematic, highly practical introduction to the use of energy principles, traditional variational methods, and the finite element method for the solution of engineering problems involving bars, beams, torsion, plane elasticity, trusses, and plates. It begins with a review of the basic equations of mechanics, the concepts of work and energy, and key topics from variational calculus. It presents virtual work and energy principles, energy methods of solid and structural mechanics, Hamilton's principle for dynamical systems, and classical variational methods of approximation. And it takes a more unified approach than that found in most solid mechanics books, to introduce the finite element method. Featuring more than 200 illustrations and tables, this Third Edition has been extensively reorganized and contains much new material, including a new chapter devoted to the latest developments in functionally graded beams and plates. Offers clear and easy-to-follow descriptions of the concepts of work, energy, energy principles and variational methods Covers energy principles of solid and structural mechanics, traditional variational methods, the least-squares variational method, and the finite element, along with applications for each Provides an abundance of examples, in a problem-solving format, with descriptions of applications for equations derived in obtaining solutions to engineering structures Features end-of-the-chapter problems for course assignments, a Companion Website with a Solutions Manual, Instructor's Manual, figures, and more Energy Principles and Variational Methods in Applied Mechanics, Third Edition is both a superb text/reference for engineering students in aerospace, civil, mechanical, and applied mechanics, and a valuable working resource for engineers in design and analysis in the aircraft, automobile, civil engineering, and shipbuilding industries. Comprehensively covers the definition, methodology, and current applications of the principles of sustainability and resiliency in every engineering discipline This book contains detailed information about sustainability and resiliency principles and applications in engineering practice, and provides information on how to use scientific tools for sustainability assessment that help engineers select the best alternative for each project or activity. Logically organized around the three pillars of sustainability—environment, economy, and society—it is a primary resource for students and professionals alike. Sustainable Engineering: Drivers, Metrics, Tools, and Applications offers numerous ways to help engineers contribute towards global sustainable development while solving some of the grand challenges the world is facing today. The first part of the book covers the environmental, economic, and social impacts associated with project/product development as well as society as a whole. This is followed by a section devoted to sustainability metrics and assessment tools, which includes material flow analysis and material budget, carbon footprint analysis, life cycle assessment, environmental health risk assessment, and more. Next comes an in-depth examination of sustainable engineering practices, including sustainable energy engineering, sustainable waste management, and green and sustainable buildings. The

book concludes with a look at how sustainable engineering may be applied to different engineering (i.e. environmental, chemical, civil, materials, infrastructure) projects. Some of the key features of this book include the following: Provides a complete and sensible understanding of the important concepts of sustainability, resiliency, and sustainable engineering Offers detailed explanations of sustainable engineering practices in waste management and remediation of contaminated sites, civil construction and infrastructure, and climate geoengineering Presents a set of case studies across different engineering disciplines such as bio/chemical, environmental, materials, construction, and infrastructure engineering that demonstrate the practical applicability of sustainability assessment tools to diverse projects Includes questions at the end of each chapter as well as a solutions manual for academic adopters The depth of coverage found in *Sustainable Engineering: Drivers, Metrics, Tools, and Applications* makes it an ideal textbook for graduate students across all engineering disciplines and a handy resource for active professionals. Learn how to program with C++ using today's definitive choice for your first programming language experience -- *C++ PROGRAMMING: FROM PROBLEM ANALYSIS TO PROGRAM DESIGN, 8E*. D.S. Malik's time-tested, user-centered methodology incorporates a strong focus on problem-solving with full-code examples that vividly demonstrate the hows and whys of applying programming concepts and utilizing C++ to work through a problem. Thoroughly updated end-of-chapter exercises, more than 20 extensive new programming exercises, and numerous new examples drawn from Dr. Malik's experience further strengthen the reader's understanding of problem solving and program design in this new edition. This book highlights the most important features of C++ 14 Standard with timely discussions that ensure this edition equips you to succeed in your first programming experience and well beyond. Important Notice: Media content referenced within the product description or the product text may not be available in the ebook version. A detailed and up-to-date introduction to machine learning, presented through the unifying lens of probabilistic modeling and Bayesian decision theory. This book offers a detailed and up-to-date introduction to machine learning (including deep learning) through the unifying lens of probabilistic modeling and Bayesian decision theory. The book covers mathematical background (including linear algebra and optimization), basic supervised learning (including linear and logistic regression and deep neural networks), as well as more advanced topics (including transfer learning and unsupervised learning). End-of-chapter exercises allow students to apply what they have learned, and an appendix covers notation. Probabilistic Machine Learning grew out of the author's 2012 book, *Machine Learning: A Probabilistic Perspective*. More than just a simple update, this is a completely new book that reflects the dramatic developments in the field since 2012, most notably deep learning. In addition, the new book is accompanied by online Python code, using libraries such as scikit-learn, JAX, PyTorch, and Tensorflow, which can be used to reproduce nearly all the figures; this code can be run inside a web browser using cloud-based notebooks, and provides a practical complement to the theoretical topics discussed in the book. This introductory text will be followed by a sequel that covers more advanced topics, taking the same probabilistic approach. This is a book for people who love mechanics of composite materials and ? MATLAB . We will use the popular computer package MATLAB as a matrix calculator for doing the numerical calculations needed in mechanics of c- posite materials. In particular, the steps of the mechanical calculations will be emphasized in this book. The reader will not ?nd ready-made MATLAB programs for use as black boxes. Instead step-by-step solutions of composite material mechanics problems are examined in detail using MATLAB. All the problems in the book assume linear elastic behavior in structural mechanics. The emphasis is not on mass computations or programming, but rather on learning the composite material mechanics computations and understanding of the underlying concepts. The basic aspects of the mechanics of fiber-reinforced composite materials are covered in this book. This includes lamina analysis in both the local and global coordinate systems, laminate analysis, and failure theories of a lamina. From theory and fundamentals to the latest advances in computational and experimental modal analysis, this is the definitive, updated reference on structural dynamics. This edition updates Professor Craig's classic introduction to structural dynamics, which has been an invaluable resource for practicing engineers and a textbook for undergraduate and graduate courses in vibrations and/or structural dynamics. Along with comprehensive coverage of structural dynamics fundamentals, finite-element-based computational methods, and dynamic testing methods, this Second Edition includes new and expanded coverage of computational methods, as well as introductions to more advanced topics, including experimental modal analysis and "active structures." With a systematic approach, it presents solution techniques that apply to various engineering disciplines. It discusses single degree-of-freedom (SDOF) systems, multiple degrees-of-freedom (MDOF) systems, and continuous systems in depth; and includes numeric evaluation of modes and frequency of MDOF systems; direct integration methods for dynamic response of SDOF systems and MDOF systems; and component mode synthesis. Numerous illustrative examples help engineers apply the techniques and methods to challenges they face in the real world. MATLAB(r) is extensively used throughout the book, and many of the .m-files are made available on the book's Web site. *Fundamentals of Structural Dynamics, Second Edition* is an indispensable reference and "refresher course" for engineering professionals; and a textbook for seniors or graduate students in mechanical engineering, civil engineering, engineering mechanics, or aerospace engineering. *Mechanics of Solids* emphasizes the development of analysis

techniques from basic principles for a broad range of practical problems, including simple structures, pressure vessels, beams and shafts. Increased use of personal computers has revolutionized the way in which engineering problems are being solved and this is reflected in the way subjects such as mechanics of solids are taught. A unique feature of this book is the integration of numerical and computer techniques and programs for carrying out analyses, facilitating design, and solving the problems found at the end of each chapter. However, the underlying theory and traditional manual solution methods cannot be ignored and are presented prior to the introduction of computer techniques. All programs featured in the book are in FORTRAN 77—the language most widely used by engineers and most portable between computers. All of the programs are suitable for PCs, minicomputers, or mainframes and are available on disk. Another important feature of this book is its use of both traditional and SI units. Many examples through the text are worked in both sets of units. The data and results for every example are also shown in both types of units. Mechanics of Solids is intended for use in a first course in mechanics of solids offered to undergraduates. An Instructor's Manual containing solutions to every problem in the book is available. A fully updated introduction to the principles and applications of the finite element method. This authoritative and thoroughly revised and self-contained classic mechanical engineering textbook offers a broad-based overview and applications of the finite element method. This revision updates and expands the already large number of problems and worked-out examples and brings the technical coverage in line with current practices. You will get details on non-traditional applications in bioengineering, fluid and thermal sciences, and structural mechanics. Written by a world-renowned mechanical engineering researcher and author, An Introduction to the Finite Element Method, Fourth Edition, teaches, step-by-step, how to determine numerical solutions to equilibrium as well as time-dependent problems from fluid and thermal sciences and structural mechanics and a host of applied sciences. Beginning with the governing differential equations, the book presents a systematic approach to the derivation of weak-forms (integral formulations), interpolation theory, finite element equations, solution of problems from fluid and thermal sciences and structural mechanics, computer implementation. The author provides a solutions manual as well as computer programs that are available for download. •Features updated problems and fully worked-out solutions•Contains downloadable programs that can be applied and extended to real-world situations•Written by a highly-cited mechanical engineering researcher and well-respected author

The modern electronic testing has a forty year history. Test professionals hold some fairly large conferences and numerous workshops, have a journal, and there are over one hundred books on testing. Still, a full course on testing is offered only at a few universities, mostly by professors who have a research interest in this area. Apparently, most professors would not have taken a course on electronic testing when they were students. Other than the computer engineering curriculum being too crowded, the major reason cited for the absence of a course on electronic testing is the lack of a suitable textbook. For VLSI the foundation was provided by semiconductor device technology, circuit design, and electronic testing. In a computer engineering curriculum, therefore, it is necessary that foundations should be taught before applications. The field of VLSI has expanded to systems-on-a-chip, which include digital, memory, and mixed-signalsubsystems. To our knowledge this is the first textbook to cover all three types of electronic circuits. We have written this textbook for an undergraduate “foundations” course on electronic testing. Obviously, it is too voluminous for a one-semester course and a teacher will have to select from the topics. We did not restrict such freedom because the selection may depend upon the individual expertise and interests. Besides, there is merit in having a larger book that will retain its usefulness for the owner even after the completion of the course. With equal tenacity, we address the needs of three other groups of readers. Written by two well-respected experts in the field, The Finite Element Method for Boundary Value Problems: Mathematics and Computations bridges the gap between applied mathematics and application-oriented computational studies using FEM. Mathematically rigorous, the FEM is presented as a method of approximation for differential operators that are mathematically classified as self-adjoint, non-self-adjoint, and non-linear, thus addressing totality of all BVPs in various areas of engineering, applied mathematics, and physical sciences. These classes of operators are utilized in various methods of approximation: Galerkin method, Petrov-Galerkin Method, weighted residual method, Galerkin method with weak form, least squares method based on residual functional, etc. to establish unconditionally stable finite element computational processes using calculus of variations. Readers are able to grasp the mathematical foundation of finite element method as well as its versatility of applications. h-, p-, and k-versions of finite element method, hierarchical approximations, convergence, error estimation, error computation, and adaptivity are additional significant aspects of this book. Continuum mechanics deals with the stress, deformation, and mechanical behaviour of matter as a continuum rather than a collection of discrete particles. The subject is interdisciplinary in nature, and has gained increased attention in recent times primarily because of a need to understand a variety of phenomena at different spatial scales. The second edition of Principles of Continuum Mechanics provides a concise yet rigorous treatment of the subject of continuum mechanics and elasticity at the senior undergraduate and first-year graduate levels. It prepares engineer-scientists for advanced courses in traditional as well as emerging fields such as biotechnology, nanotechnology, energy systems, and computational mechanics. The large number of examples and exercise problems contained in the book systematically advance the

understanding of vector and tensor analysis, basic kinematics, balance laws, field equations, constitutive equations, and applications. A solutions manual is available for the book. Providing an introduction to functional analysis, this text treats in detail its application to boundary-value problems and finite elements, and is distinguished by the fact that abstract concepts are motivated and illustrated wherever possible. It is intended for use by senior undergraduates and graduates in mathematics, the physical sciences and engineering, who may not have been exposed to the conventional prerequisites for a course in functional analysis, such as real analysis. Mature researchers wishing to learn the basic ideas of functional analysis will equally find this useful. Offers a good grounding in those aspects of functional analysis which are most relevant to a proper understanding and appreciation of the mathematical aspects of boundary-value problems and the finite element method. As most modern technologies are no longer discipline-specific but involve multidisciplinary approaches, undergraduate engineering students should be introduced to the principles of mechanics so that they have a strong background in the basic principles common to all disciplines and are able to work at the interface of science and engineering disciplines. This textbook is designed for a first course on principles of mechanics and provides an introduction to the basic concepts of stress and strain and conservation principles. It prepares engineer-scientists for advanced courses in traditional as well as emerging fields such as biotechnology, nanotechnology, energy systems, and computational mechanics. This simple book presents the subjects of mechanics of materials, fluid mechanics, and heat transfer in a unified form using the conservation principles of mechanics. This text presents a complete treatment of the theory and analysis of elastic plates. It provides detailed coverage of classic and shear deformation plate theories and their solutions by analytical as well as numerical methods for bending, buckling and natural vibrations. Analytical solutions are based on the Navier and Levy solution method, and numerical solutions are based on the Rayleigh-Ritz methods and finite element method. The author address a range of topics, including basic equations of elasticity, virtual work and energy principles, cylindrical bending of plates, rectangular plates and an introduction to the finite element method with applications to plates.

Distributed and Cloud Computing: From Parallel Processing to the Internet of Things offers complete coverage of modern distributed computing technology including clusters, the grid, service-oriented architecture, massively parallel processors, peer-to-peer networking, and cloud computing. It is the first modern, up-to-date distributed systems textbook; it explains how to create high-performance, scalable, reliable systems, exposing the design principles, architecture, and innovative applications of parallel, distributed, and cloud computing systems. Topics covered by this book include: facilitating management, debugging, migration, and disaster recovery through virtualization; clustered systems for research or ecommerce applications; designing systems as web services; and social networking systems using peer-to-peer computing. The principles of cloud computing are discussed using examples from open-source and commercial applications, along with case studies from the leading distributed computing vendors such as Amazon, Microsoft, and Google. Each chapter includes exercises and further reading, with lecture slides and more available online. This book will be ideal for students taking a distributed systems or distributed computing class, as well as for professional system designers and engineers looking for a reference to the latest distributed technologies including cloud, P2P and grid computing. Complete coverage of modern distributed computing technology including clusters, the grid, service-oriented architecture, massively parallel processors, peer-to-peer networking, and cloud computing Includes case studies from the leading distributed computing vendors: Amazon, Microsoft, Google, and more Explains how to use virtualization to facilitate management, debugging, migration, and disaster recovery Designed for undergraduate or graduate students taking a distributed systems course—each chapter includes exercises and further reading, with lecture slides and more available online

Antennas and Propagation are of fundamental importance to the coverage, capacity and quality of all wireless communication systems. This book provides a solid grounding in antennas and propagation, covering terrestrial and satellite radio systems in both mobile and fixed contexts. Building on the highly successful first edition, this fully updated text features significant new material and brand new exercises and supplementary materials to support course tutors. A vital source of information for practising and aspiring wireless communication engineers as well as for students at postgraduate and senior undergraduate levels, this book provides a fundamental grounding in the principles of antennas and propagation without excessive recourse to mathematics. It also equips the reader with practical prediction techniques for the design and analysis of a very wide range of common wireless communication systems. Including: Overview of the fundamental electromagnetic principles underlying propagation and antennas. Basic concepts of antennas and their application to specific wireless systems. Propagation measurement, modelling and prediction for fixed links, macrocells, microcells, picocells and megacells Narrowband and wideband channel modelling and the effect of the channel on communication system performance. Methods that overcome and transform channel impairments to enhance performance using diversity, adaptive antennas and equalisers. Key second edition updates: New chapters on Antennas for Mobile Systems and Channel Measurements for Mobile Radio Systems. Coverage of new technologies, including MIMO antenna systems, Ultra Wideband (UWB) and the OFDM technology used in Wi-Fi and WiMax systems. Many new propagation models for macrocells, microcells and picocells. Fully revised and expanded end-of-chapter exercises. The Solutions Manual can be requested from

http://www.wiley.com/go/saunders_antennas_2e The book retains its strong conceptual approach, clearly examining the mathematical underpinnings of FEM, and providing a general approach of engineering application areas. Known for its detailed, carefully selected example problems and extensive selection of homework problems, the author has comprehensively covered a wide range of engineering areas making the book appropriate for all engineering majors, and underscores the wide range of use FEM has in the professional world. With its modern emphasis on the molecular view of physical chemistry, its wealth of contemporary applications, vivid full-color presentation, and dynamic new media tools, the thoroughly revised new edition is again the most modern, most effective full-length textbook available for the physical chemistry classroom. Available in Split Volumes For maximum flexibility in your physical chemistry course, this text is now offered as a traditional text or in two volumes. Volume 1: Thermodynamics and Kinetics; ISBN 1-4292-3127-0 Volume 2: Quantum Chemistry, Spectroscopy, and Statistical Thermodynamics; ISBN 1-4292-3126-2 About the Book: Written by three distinguished authors with ample academic and teaching experience, this textbook, meant for diploma and degree students of Mechanical Engineering as well as those preparing for AMIE examination, incorporates the latest st Essentials of Offshore Structures: Framed and Gravity Platforms examines the engineering ideas and offshore drilling platforms for exploration and production. This book offers a clear and acceptable demonstration of both the theory and application of the relevant procedures of structural, fluid, and geotechnical mechanics to offshore structures. It Applied Data Analysis and Modeling for Energy Engineers and Scientists fills an identified gap in engineering and science education and practice for both students and practitioners. It demonstrates how to apply concepts and methods learned in disparate courses such as mathematical modeling, probability, statistics, experimental design, regression, model building, optimization, risk analysis and decision-making to actual engineering processes and systems. The text provides a formal structure that offers a basic, broad and unified perspective, while imparting the knowledge, skills and confidence to work in data analysis and modeling. This volume uses numerous solved examples, published case studies from the author's own research, and well-conceived problems in order to enhance comprehension levels among readers and their understanding of the "processes" along with the tools. This best-selling textbook presents the concepts of continuum mechanics, and the second edition includes additional explanations, examples and exercises. An understanding of the quantum mechanical nature of magnetism has led to the development of new magnetic materials which are used as permanent magnets, sensors, and information storage. Behind these practical applications lie a range of fundamental ideas, including symmetry breaking, order parameters, excitations, frustration, and reduced dimensionality. This superb new textbook presents a logical account of these ideas, starting from basic concepts in electromagnetism and quantum mechanics. It outlines the origin of magnetic moments in atoms and how these moments can be affected by their local environment inside a crystal. The different types of interactions which can be present between magnetic moments are described. The final chapters of the book are devoted to the magnetic properties of metals, and to the complex behaviour which can occur when competing magnetic interactions are present and/or the system has a reduced dimensionality. Throughout the text, the theoretical principles are applied to real systems. There is substantial discussion of experimental techniques and current research topics. The book is copiously illustrated and contains detailed appendices which cover the fundamental principles. For many years, Protective Relaying: Principles and Applications has been the go-to text for gaining proficiency in the technological fundamentals of power system protection. Continuing in the bestselling tradition of the previous editions by the late J. Lewis Blackburn, the Fourth Edition retains the core concepts at the heart of power system analysis. Featuring refinements and additions to accommodate recent technological progress, the text: Explores developments in the creation of smarter, more flexible protective systems based on advances in the computational power of digital devices and the capabilities of communication systems that can be applied within the power grid Examines the regulations related to power system protection and how they impact the way protective relaying systems are designed, applied, set, and monitored Considers the evaluation of protective systems during system disturbances and describes the tools available for analysis Addresses the benefits and problems associated with applying microprocessor-based devices in protection schemes Contains an expanded discussion of inertia protection requirements at dispersed generation facilities Providing information on a mixture of old and new equipment, Protective Relaying: Principles and Applications, Fourth Edition reflects the present state of power systems currently in operation, making it a handy reference for practicing protection engineers. And yet its challenging end-of-chapter problems, coverage of the basic mathematical requirements for fault analysis, and real-world examples ensure engineering students receive a practical, effective education on protective systems. Plus, with the inclusion of a solutions manual and figure slides with qualifying course adoption, the Fourth Edition is ready-made for classroom implementation. Designed for a one-semester course in Finite Element Method, this compact and well-organized text presents FEM as a tool to find approximate solutions to differential equations. This provides the student a better perspective on the technique and its wide range of applications. This approach reflects the current trend as the present-day applications range from structures to biomechanics to electromagnetics, unlike in conventional texts that view FEM primarily as an extension of matrix methods of structural analysis. After an

introduction and a review of mathematical preliminaries, the book gives a detailed discussion on FEM as a technique for solving differential equations and variational formulation of FEM. This is followed by a lucid presentation of one-dimensional and two-dimensional finite elements and finite element formulation for dynamics. The book concludes with some case studies that focus on industrial problems and Appendices that include mini-project topics based on near-real-life problems. Postgraduate/Senior undergraduate students of civil, mechanical and aeronautical engineering will find this text extremely useful; it will also appeal to the practising engineers and the teaching community.

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