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Structural and Residual Stress Analysis by Nondestructive Methods CRC Press

Stanley traces women's inventions in five vital areas of technology worldwide--agriculture, medicine, reproduction, machines, and computers.

Stress Test SDC Publications

An Autodesk Official Press guide to the powerful mechanical design software Autodesk Inventor has been used to design everything from cars and airplanes to appliances and furniture. This comprehensive guide to Inventor and Inventor LT features real-world workflows and

work environments, and is packed with practical tutorials that focus on teaching Inventor tips, tricks, and techniques. Additionally, you can download datasets to jump in and practice on any exercise. This reference and tutorial explains key interface conventions, capabilities, tools, and techniques, including design concepts and application, parts design, assemblies and subassemblies, weldment design, and the use of Design Accelerators and Design Calculators. There's also detailed coverage of design tactics for large assemblies, effective model design for various industries, strategies for effective data and asset sharing, using 2D and 3D data from other CAD systems, and improving designs by incorporating engineering principles. Uses real-world sample projects so you can quickly grasp the interface, tools, and processes Features detailed documentation on everything from project set up to simple animations and documentation for exploded views, sheet metal flat patterns, plastic part design, and more Covers crucial productivity-boosting tools, iLogic, data exchange, the Frame Generator, Inventor Studio visualization tools, dynamic simulation and stress analysis features, and routed systems features Downloadable datasets let you jump into the step-by-step tutorials anywhere Mastering Autodesk

Inventor and Autodesk Inventor LT is the essential, comprehensive training guide for this powerful software.

Mastering Autodesk Inventor 2010 Elsevier

Parametric Modeling with Autodesk Inventor 2022 contains a series of seventeen tutorial style lessons designed to introduce Autodesk Inventor, solid modeling, and parametric modeling. It uses a hands-on, exercise-intensive approach to all the important parametric modeling techniques and concepts. The lessons guide the user from constructing basic shapes to building intelligent mechanical designs, to creating multi-view drawings and assembly models. Other featured topics include sheet metal design, motion analysis, 2D design reuse, collision and contact, stress analysis, 3D printing and the Autodesk Inventor 2022 Certified User Examination. Video Training Included with every new copy of this book is access to extensive video training. There are forty-seven videos that total nearly six hours of training in total. This video training parallels the exercises found in the text. However, the videos do more than just provide you with click by click instructions. Author Luke Jumper also includes a brief discussion of each tool, as well as rich insight into why and how the tools are used. Luke isn't just telling you what to do, he's showing and explaining to you how to go through the exercises while providing clear descriptions of the entire process. It's like having him there guiding you through the book. These videos will provide you with a wealth of information and brings the text to life. They are also an invaluable resource for people who learn best through a visual experience. These videos deliver a comprehensive overview of the tools found in Autodesk Inventor and perfectly complement and reinforce the exercises in the book.

Tools for Design Using AutoCAD 2021 and Autodesk Inventor 2021 CRC Press

Tools for Design is intended to provide the user with an overview of computer aided design using two popular CAD software

packages from Autodesk: AutoCAD and Autodesk Inventor. This book explores the strengths of each package and shows how they can be used in design, both separately and in combination with each other. What you'll learn How to create and dimension 2D multiview drawings using AutoCAD How to freehand sketch using axonometric, oblique and perspective projection techniques How to create 3D parametric models and 2D multiview drawings using Autodesk Inventor How to reuse design information between AutoCAD and Autodesk Inventor How to combine parts into assemblies including assembly modeling with a LEGO® MINDSTORMS® Education Base Set, with a TETRIX® kit and a VEX Robot Kit How to perform basic finite element stress analysis using Inventor Stress Analysis Module Who this book is for This book is designed for high school and college age students wanting to learn the fundamentals of computer aided design with AutoCAD and Inventor and how the two can be used together. No prior CAD experience is required.

Autodesk Inventor 2020 and Engineering Graphics Bookboon

Tools for Design is intended to provide the user with an overview of computer aided design using two popular

CAD software packages from Autodesk: AutoCAD and Autodesk Inventor. This book explores the strengths of each package and shows how they can be used in design, both separately and in combination with each other. What you'll learn

- How to create and dimension 2D multiview drawings using AutoCAD
- How to freehand sketch using axonometric, oblique and perspective projection techniques
- How to create 3D parametric models and 2D multiview drawings using Autodesk Inventor
- How to reuse design information between AutoCAD and Autodesk Inventor
- How to combine parts into assemblies including assembly modeling with a LEGO® MINDSTORMS® Education Base Set, with a TETRIX® kit and a VEX Robot Kit
- How to perform basic finite element stress analysis using Inventor Stress Analysis Module

Who this book is for This book is designed for high school and college age students wanting to learn the fundamentals of computer aided design with AutoCAD and Inventor and how the two can be used together. No prior CAD experience is required.

Autodesk Inventor and industrial use of Autodesk Inventor. In this edition of book, we have included topics on iPart, Style Editing, Customization, Deriving parts, Inspection, and Advanced Assembly. The book covers almost all the information required by a learner to master the Autodesk Inventor. The book starts with sketching and ends at advanced topics like Mold Design, Sheetmetal, Weldment, and MBD. Some of the salient features of this book are:

- In-Depth explanation of concepts Every new topic of this book starts with the explanation of the basic concepts. In this way, the user becomes capable of relating the things with real world.
- Topics Covered Every chapter starts with a list of topics being covered in that chapter. In this way, the user can easily find the topic of his/her interest easily.
- Instruction through illustration The instructions to perform any action are provided by maximum number of illustrations so that the user can perform the actions discussed in the book easily and effectively. There are about 2050 small and large illustrations that make the learning process effective.
- Tutorial point of view At the end of concept's explanation, the tutorial makes the understanding of users firm and long lasting. Almost each chapter of the book has tutorials that are real world projects. Moreover most of the tools in this book are discussed in the form of tutorials.

Project Projects and exercises are provided to students for practicing. For Faculty If you are a faculty member, then you can ask for video tutorials on any of the topic, exercise, tutorial, or concept.

Up and Running with Autodesk Inventor Simulation

2011 Grand Central Publishing

Autodesk Inventor Professional 2023 for Designers is a comprehensive book that introduces the users to Autodesk Inventor 2023, a feature-based 3D parametric solid modeling software. All environments of this solid modelling software are covered in this book with a thorough explanation of commands, options, and their applications to create real-world products. The mechanical engineering industry examples that are used as tutorials and the related additional exercises at the end of each chapter help the users to understand the design techniques used in the industry to design a product. Additionally, the author emphasizes on the solid modelling techniques that will improve the productivity and efficiency of the users. After reading this book, the users will be able to create solid parts, sheet metal parts, assemblies, weldments, drawing views with bill of materials, presentation views to animate the assemblies and apply direct modelling techniques to facilitate rapid design prototyping. Also, the users will learn the editing techniques that are essential for making a successful design.

Salient Features

Comprehensive book consisting of 20 chapters organized in a pedagogical sequence. Detailed explanation of all concepts, techniques, commands, and tools of Autodesk Inventor Professional 2023. Step-by-step instructions that guide the users through the learning

process. Real-world mechanical engineering designs as tutorials and projects. Self-Evaluation Test, Review Questions, and Exercises are given at the end of the chapters.

Table of Contents

Chapter 1: Introduction
Chapter 2: Sketching, Dimensioning, and Creating Base Features and Drawing
Chapter 3: Adding Constraints to Sketches
Chapter 4: Editing, Extruding, and Revolving the Sketches
Chapter 5: Other Sketching and Modeling Options
Chapter 6: Advanced Modeling Tools-I
Chapter 7: Editing Features and Adding Automatic Dimensions to Sketches
Chapter 8: Advanced Modeling Tools-II
Chapter 9: Assembly Modeling-I
Chapter 10: Assembly Modeling-II
Chapter 11: Working with Drawing Views-I
Chapter 12: Working with Drawing Views-II
Chapter 13: Presentation Module
Chapter 14: Working with Sheet Metal Components
Chapter 15: Introduction to Stress Analysis
Chapter 16: Introduction to Weldments *
Chapter 17: Miscellaneous Tools *
Chapter 18: Working with Special Design Tools *
Chapter 19: Introduction to Plastic Mold Design *
Chapter 20: Introduction to Inventor Nastran *
Index (* For free download)

Mastering Autodesk Inventor 2014 and Autodesk Inventor LT 2014 SDC Publications

The field of stress analysis has gained its momentum from the widespread applications in industry and technology and has now become an important part of

materials science. Various destructive as well as nondestructive methods have been developed for the determination of stresses. This timely book provides a comprehensive review of the nondestructive techniques for strain evaluation written by experts in their respective fields. The main part of the book deals with X-ray stress analysis (XSA), focussing on measurement and evaluation methods which can help to solve the problems of today, the numerous applications of metallic, polymeric and ceramic materials as well as of thin-film-substrate composites and of advanced microcomponents. Furthermore it contains data, results, hints and recommendations that are valuable to laboratories for the certification and accreditation of their stress analysis. Stress analysis is an active field in which many questions remain unsettled. Accordingly, unsolved problems and conflicting results are discussed as well. The assessment of the experimentally determined residual and structural stress states on the static and dynamic behavior of materials and components is handled in a separate chapter. Students and engineers of materials science and scientists working in laboratories and industries will find this book invaluable.

Publications

Tools for Design is intended to provide the user with an overview of computer aided design using two popular CAD software packages from Autodesk: AutoCAD and Autodesk Inventor. This book explores the strengths of each package and shows how they can be used in design, both separately and in combination with each other. What you'll learn How to create and dimension 2D multiview drawings using AutoCAD How to freehand sketch using axonometric, oblique and perspective projection techniques How to create 3D parametric models and 2D multiview drawings using Autodesk Inventor How to reuse design information between AutoCAD and Autodesk Inventor How to combine parts into assemblies including assembly modeling with a LEGO® MINDSTORMS® Education Base Set, with a TETRIX® kit and a VEX Robot Kit How to perform basic finite element stress analysis using Inventor Stress Analysis Module Autodesk Inventor 2018 A Tutorial Introduction SDC Publications

Parametric Modeling with Autodesk Inventor 2021 contains a series of seventeen tutorial style lessons designed to introduce Autodesk Inventor, solid modeling, and parametric modeling. It uses a hands-on, exercise-intensive approach to all the important parametric modeling techniques and concepts. The lessons guide the user from constructing basic shapes to building intelligent mechanical designs, to creating multi-view drawings and assembly models. Other featured topics include sheet metal design, motion analysis, 2D design reuse, collision

Tools for Design With Vex Robot Kit SDC Publications
Parametric Modeling with Autodesk Inventor 2016 SDC Publications

Essentials of Mechanical Stress Analysis SDC

and contact, stress analysis, 3D printing and the Autodesk Inventor 2021 Certified User Examination. Video Training Included with every new copy of this book is access to extensive video training. The video training parallels the exercises found in the text and are designed to be watched first before following the instructions in the book. However, the videos do more than just provide you with click by click instructions. Author Luke Jumper also includes a brief discussion of each tool, as well as rich insight into why and how the tools are used. Luke isn't just telling you what to do, he's showing and explaining to you how to go through the exercises while providing clear descriptions of the entire process. It's like having him there guiding you through the book. These videos will provide you with a wealth of information and brings the text to life. They are also an invaluable resource for people who learn best through a visual experience. These videos deliver a comprehensive overview of the tools found in Autodesk Inventor and perfectly complement and reinforce the exercises in the book. Autodesk Inventor 2021 Certified User Examination The content of Parametric Modeling with Autodesk Inventor 2021 covers the performance tasks that have been identified by Autodesk as being included on the Autodesk Inventor 2021 Certified User examination. Special reference guides show students where the performance tasks are covered in the book.

Parametric Modeling with Autodesk Inventor 2021

Cadcamcae Works

Autodesk Inventor 2020 and Engineering Graphics: An

Integrated Approach will teach you the principles of engineering graphics while instructing you on how to use the powerful 3D modeling capabilities of Autodesk Inventor 2020. Using step-by-step tutorials, this text will teach you how to create and read engineering drawings while becoming proficient at using the most common features of Autodesk Inventor. By the end of the book you will be fully prepared to take and pass the Autodesk Inventor Certified User Exam. This text is intended to be used as a training guide for students and professionals. The chapters in this text proceed in a pedagogical fashion to guide you from constructing basic shapes to making complete sets of engineering drawings. This text takes a hands-on, exercise-intensive approach to all the important concepts of Engineering Graphics, as well as in-depth discussions of parametric feature-based CAD techniques. This textbook contains a series of fifteen chapters, with detailed step-by-step tutorial style lessons, designed to introduce beginning CAD users to the graphic language used in all branches of technical industry. This book does not attempt to cover all of Autodesk Inventor 2020's features, only to provide an introduction to the software. It is intended to help you establish a good basis for exploring and growing in the exciting field of Computer Aided Engineering. Autodesk Inventor 2020 Certified User Examination The content of this book covers the performance tasks that have been identified by Autodesk as being included on the Autodesk Inventor 2020 Certified User examination. Special reference guides show students where the performance tasks are covered in the book.

Autodesk Inventor Professional 2020 for Designers, 20th Edition Butterworth-Heinemann

Tools for Design is intended to provide you with an overview of computer aided design using two popular CAD software packages from Autodesk: AutoCAD and Autodesk Inventor. This book explores the strengths of each package and shows how they can be used in design, both separately and in combination with each other. What you'll learn • How to create and dimension 2D multiview drawings using AutoCAD • How to freehand sketch using axonometric, oblique and perspective projection techniques • How to create 3D parametric models and 2D multiview drawings using Autodesk Inventor • How to reuse design information between AutoCAD and Autodesk Inventor • How to combine parts into assemblies including assembly modeling with a LEGO® MINDSTORMS® Education Base Set, with a TETRIX® kit and a VEX Robot Kit • How to perform basic finite element stress analysis using Inventor Stress Analysis Module Who this book is for This book is designed for high school and college age students wanting to learn the fundamentals of computer aided design with AutoCAD and Inventor and how the two can be used together. No prior CAD experience is required. Table of Contents Introduction: Getting Started 1. Fundamentals of AutoCAD 2. Basic Object Construction and Dynamic Input - AutoCAD 3. Geometric Construction and Editing Tools - AutoCAD 4. Orthographic Views in Multiview Drawings - AutoCAD 5. Basic Dimensioning and Notes - AutoCAD 6. Pictorials and Sketching 7. Parametric Modeling

Fundamentals - Autodesk Inventor 8. Constructive Solid Geometry Concepts - Autodesk Inventor 9. Model History Tree - Autodesk Inventor 10. Parametric Constraints Fundamentals - Autodesk Inventor 11. Geometric Construction Tools - Autodesk Inventor 12. Parent/Child Relationships and the BORN Technique - Autodesk Inventor 13. Part Drawings and 3D Model-Based Definition - Autodesk Inventor 14. Symmetrical Features in Design - Autodesk Inventor 15. Design Reuse Using AutoCAD and Autodesk Inventor 16. Assembly Modeling - Putting It All Together - Autodesk Inventor 17. Design Analysis - Autodesk Inventor Stress Analysis Module Autodesk Inventor Professional 2022 for Designers, 22nd Edition Elsevier

Autodesk Inventor Professional 2020 for Designers is a comprehensive book that introduces the users to Autodesk Inventor 2020, a feature-based 3D parametric solid modeling software. All environments of this solid modelling software are covered in this book with a thorough explanation of commands, options, and their applications to create real-world products. The mechanical engineering industry examples that are used as tutorials and the related additional exercises at the end of each chapter help the users to understand the design techniques used in the industry to design a product. Additionally, the author emphasizes on the solid modelling techniques that will improve the productivity and efficiency of the users. After reading this book, the users will be able to create solid parts, sheet metal parts, assemblies, weldments, drawing views with bill of materials, presentation views to animate the assemblies and apply direct modelling techniques to facilitate rapid design prototyping. Also, the users will learn the editing techniques that are essential for making a

successful design. Salient Features: Comprehensive book consisting of 19 chapters organized in a pedagogical sequence. Detailed explanation of all concepts, techniques, commands, and tools of Autodesk Inventor Professional 2020. Tutorial approach to explain the concepts. Step-by-step instructions that guide the users through the learning process. More than 54 real-world mechanical engineering designs as tutorials and projects. Self-Evaluation Test, Review Questions, and Exercises are given at the end of the chapters so that the users can assess their knowledge. Technical support by contacting 'techsupport@cadcim.com'. Table of Contents Chapter 1: Introduction Chapter 2: Drawing Sketches for Solid Models Chapter 3: Adding Constraints and Dimensions to Sketches Chapter 4: Editing, Extruding, and Revolving the Sketches Chapter 5: Other Sketching and Modeling Options Chapter 6: Advanced Modeling Tools-I Chapter 7: Editing Features and Adding Automatic Dimensions to Sketches Chapter 8: Advanced Modeling Tools-II Chapter 9: Assembly Modeling-I Chapter 10: Assembly Modeling-II Chapter 11: Working with Drawing Views-I Chapter 12: Working with Drawing Views-II Chapter 13: Presentation Module Chapter 14: Working with Sheet Metal Components Chapter 15: Introduction to Stress Analysis Chapter 16: Introduction to Weldments (For free download) Chapter 17: Miscellaneous Tools (For free download) Chapter 18: Working with Special Design Tools For free download) Chapter 19: Introduction to Plastic Mold Design (For free download) Index

Popular Science Crown

Up and Running with Autodesk Inventor Simulation 2011 provides a clear path to perfecting the skills of designers and engineers using simulation inside Autodesk Inventor. This book includes modal analysis, stress singularities, and H-P convergence, in addition to the new frame analysis

functionality. The book is divided into three sections: dynamic solution, stress analysis, and frame analysis, with a total of nineteen chapters. The first chapter of each section offers an overview of the topic covered in that section. There is also an overview of the Inventor Simulation interface and its strengths, weaknesses, and workarounds. Furthermore, the book emphasizes the joint creation process and discusses in detail the unique and powerful parametric optimization function. This book will be a useful learning tool for designers and engineers, and a source for applying simulation for faster production of better products. Get up to speed fast with real-life, step-by-step design problems—3 new to this edition! Discover how to convert CAD models to working digital prototypes, enabling you to enhance designs and simulate real-world performance without creating physical prototypes Learn all about the frame analysis environment—new to Autodesk Inventor Simulation 2011—and other key features of this powerful software, including modal analysis, assembly stress analysis, parametric optimization analysis, effective joint creation, and more Manipulate and experiment with design solutions from the book using datasets provided on the book's companion website (<http://www.elsevierdirect.com/v2/companion.jsp?ISBN=9780123821027>) and move seamlessly onto tackling your own design challenges with confidence New edition features enhanced coverage of key areas, including stress singularities, h-p convergence, curved elements, mechanism redundancies, FEA and simulation theory, with hand calculations, and more Autodesk Inventor 2022 A Tutorial Introduction SDC Publications

This book will teach you everything you need to know to start using Autodesk Inventor 2021 with easy to understand, step-by-step tutorials. This book features

a simple robot design used as a project throughout the book. You will learn to model parts, create assemblies, run simulations and even create animations of your robot design. An unassembled version of the same robot used throughout the book can be bundled with the book. No previous experience with Computer Aided Design(CAD) is needed since this book starts at an introductory level. The author begins by getting you familiar with the Inventor interface and its basic tools. You will start by learning to model simple robot parts and before long you will graduate to creating more complex parts and multi-view drawings. Along the way you will learn the fundamentals of parametric modeling through the use of geometric constraints and relationships. You will also become familiar with many of Inventor's powerful tools and commands that enable you to easily construct complex features in your models. Also included is coverage of gears, gear trains and spur gear creation using Autodesk Inventor. This book continues by examining the different mechanisms commonly used in walking robots. You will learn the basic types of planar four-bar linkages commonly used in mechanical designs and how to use the GeoGebra Dynamic Geometry software to simulate and analyze 2D linkages. Using the knowledge you gained about linkages and mechanism, you will learn how to modify your robot and change its behavior by modifying or creating new parts. In the final chapter of this book you learn how to combine all the robot parts into assemblies and then run motion analysis. You will finish off your project by creating 3D animations of your robot in action. There are many books that show you how to perform individual tasks with Autodesk Inventor, but this book takes you through an entire project and shows you the complete engineering process. By the end of this book you will have modeled and assembled nearly all the parts that make up the TAMIYA® Mechanical Tiger and can start building your own robot.

SDC Publications

Autodesk Inventor 2021 and Engineering Graphics: An Integrated Approach will teach you the principles of engineering graphics while instructing you on how to use the powerful 3D modeling capabilities of Autodesk Inventor 2021. Using step-by-step tutorials, this text will teach you how to create and read engineering drawings while becoming proficient at using the most common features of Autodesk Inventor. By the end of the book you will be fully prepared to take and pass the Autodesk Inventor Certified User Exam. This text is intended to be used as a training guide for students and professionals. The chapters in this text proceed in a pedagogical fashion to guide you from constructing basic shapes to making complete sets of engineering drawings. This text takes a hands-on, exercise-intensive approach to all the important concepts of Engineering Graphics, as well as in-depth discussions of parametric feature-based CAD techniques.

This textbook contains a series of fifteen chapters, with detailed step-by-step tutorial style lessons, designed to introduce beginning CAD users to the graphic language used in all branches of technical industry. This book does not attempt to cover all of Autodesk Inventor 2021's features, only to provide an introduction to the software. It is intended to help you establish a good basis for exploring and growing in the exciting field of Computer Aided Engineering. Autodesk Inventor 2021 Certified User Examination The content of this book covers the performance tasks that have been identified by Autodesk as being included on the Autodesk Inventor 2021 Certified User examination. Special reference guides show students where the performance tasks are covered in the book. Simulation of Material Processing: Theory, Methods and Application SDC Publications

A complete tutorial for the real-world application of Autodesk Inventor, plus video instruction on DVD Used to design everything from airplanes to appliances, Autodesk Inventor is the industry-leading 3D mechanical design software. This detailed tutorial and reference covers practical applications to help you solve design problems in your own work environment, allowing you to do more with less. It also addresses topics that are often omitted from other guides, such as Inventor Professional modules, design tactics for large assemblies, using 2D and 3D data from other CAD systems, and a detailed overview of the Inventor utility tools such as Design

Assistant and Task Scheduler that you didn't even know you had. Teaches the most popular 3D mechanical design software in the context of real-world workflows and work environments Provides an overview of the Inventor 2010 ribbon Interface, Inventor design concepts, and advanced information on productivity-boosting and visualization tools Offers crucial information on data exchange, including SolidWorks, Catia, Pro-E, and others. Shares details on documentation, including exploded presentation files, simple animations, rendered animations and stills with Inventor Studio, and sheet metal flat patterns Covers Inventor, Inventor Professional, and Inventor LT Includes a DVD with before-and-after tutorial files, a searchable PDF of the book, innovative video tutorials for each chapter, and more Mastering Autodesk Inventor teaches you to get the most from the software and provides a reference to help you on the job, allowing you to utilize the tools you didn't even know you had to quickly achieve professional results. Note: CD-ROM/DVD and other supplementary materials are not included as part of eBook file.

Autodesk Inventor 2022 and Engineering Graphics
CADCIM Technologies

Developed with stress analysts handling multidisciplinary subjects in mind, and written to provide the theories needed for problem solving and stress analysis on structural systems, Essentials of Mechanical Stress

Analysis presents a variety of relevant topics—normally offered as individual course topics—that are crucial for carrying out the analysis of structures. This work explores concepts through both theory and numerical examples, and covers the analytical and numerical approaches to stress analysis, as well as isotropic, metallic, and orthotropic composite material analyses. Comprised of 13 chapters, this must-have resource:

- Establishes the fundamentals of material behavior required for understanding the concepts of stress analysis
- Defines stress and strain, and elaborates on the basic concepts exposing the relationship between the two
- Discusses topics related to contact stresses and pressure vessels
- Introduces the different failure criteria and margins of safety calculations for ductile and brittle materials
- Illustrates beam analysis theory under various types of loading
- Introduces plate analysis theory
- Addresses elastic instability and the buckling of columns and plates
- Demonstrates the concept of fatigue and stress to life-cycle calculations
- Explores the application of energy methods for determining deflection and stresses of structural systems
- Highlights the numerical methods and finite element techniques most commonly used for the calculation of stress
- Presents stress analysis methods for composite laminates
- Explains fastener and joint connection analysis theory
- Provides MathCAD® sample simulation codes that can be used for fast and reliable stress analysis

Essentials of Mechanical Stress Analysis is a quintessential guide detailing topics related to stress and structural analysis for practicing stress analysts in

mechanical, aerospace, civil, and materials engineering fields and serves as a reference for higher-level undergraduates and graduate students.

[Autodesk Inventor Professional 2021 for Designers, 21st Edition](#) SDC Publications

This unique text and video set presents a thorough introduction to Autodesk Inventor for anyone with little or no prior experience with CAD software. It can be used in virtually any setting from four year engineering schools to on-the-job use or self-study. Unlike other books of its kind, it begins at a very basic level and ends at a very advanced level. It 's perfect for anyone interested in learning Autodesk Inventor quickly and effectively using a “ learning by doing ” approach. Additionally, the extensive videos that are included with this book make it easier than ever to learn Inventor by clearly demonstrating how to use its tools. The philosophy behind this book is that learning computer aided design programs is best accomplished by emphasizing the application of the tools. Students also seem to learn more quickly and retain information and skills better if they are actually creating something with the software program. The driving force behind this book is “ learning by doing. ” The instructional format of this book centers on making sure that students learn by doing and that students can learn from this book on their own. In fact, this is one thing that differentiates this book from others: the emphasis on being able to use the book for self-study. The presentation of Autodesk Inventor is structured so that no previous knowledge of any CAD program is required. This book uses the philosophy that Inventor is mastered best by concentrating on applying the program to create different types of solid models, starting simply and then using the power of the program to progressively create more complex solid

models. The Drawing Activities at the end of each chapter are more complex iterations of the part developed by each chapter ' s objectives. Since CAD programs are highly visual, there are graphical illustrations showing how to use the program. This reinforces the “ learn by doing ” philosophy since a student can see exactly what the program shows, and then step through progressive commands to implement the required operations. Rather than using a verbal description of the command, a screen capture of each command is replicated.