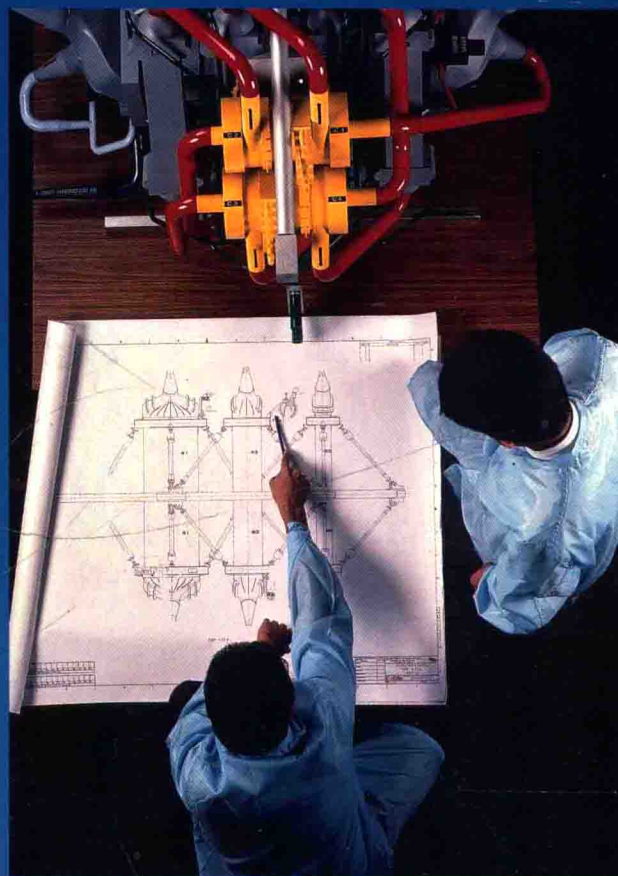


FUNDAMENTALS OF ENGINEERING DRAWING

FOURTH
EDITION



CECIL JENSEN • JAY D. HELSEL

Fundamentals of Engineering Drawing

Fourth Edition

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ABOUT THE AUTHORS

CECIL JENSEN is the author or coauthor of many successful technical books, including *Engineering Drawing and Design*, *Fundamentals of Engineering Drawing*, *Fundamentals of Engineering Graphics* (formerly called *Drafting Fundamentals*), *Interpreting Engineering Drawings*, *Geometric Dimensioning and Tolerancing for Engineering and Manufacturing Technology*, *Architectural Drawing and Design for Residential Construction*, *Home Planning and Design*, and *Interior Design*. Some of these books are printed in three languages and are used in many countries.

He has 27 years of teaching experience in mechanical and architectural drafting, and was a technical director for a large vocational school in Canada. He has also been responsible for the supervision of the teaching of technical courses for General Motors apprentices in Oshawa, Canada. Before entering the teaching profession, Mr. Jensen gained several years of design experience in the industry.

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He took an early retirement from the teaching profession in order to devote his full attention to writing.

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PREFACE

The fourth edition of *Fundamentals of Engineering Drawing* builds upon the success of the previous edition. Not all students will choose a drafting career. However, an understanding of the language of graphics is necessary for anyone who plans to work in any of the fields of technology.

Drafting, like all technical areas, is constantly changing. The computer has revolutionized the way in which drawing and parts are made. Thus, in this new edition, the authors have made every effort to translate the most current technical information available into the most useful form from the standpoint of both instructor and student. The latest developments and current practices in all areas of graphic communication, CAD, functional drafting, material representation, shop processes, and metrication have been incorporated into this edition. The approach used synthesizes, simplifies, and converts complex drafting standards and procedures into understandable instructional units.

Before beginning to work on this edition, a questionnaire was mailed to a number of users and non-users of the text requesting their input on text material and format. In response to the reviewers' suggestions and recommendations, we have incorporated the following changes in the fourth edition. The suggestions and changes are:

1. Using a two-column format, rather than a three-column format, which is easier for students to read.
2. Updating the photographs of drafting and CAD equipment. The first three chapters of this edition provide up-to-date color photographs of drafting equipment.
3. A greater selection of drawing and design projects. For this edition, we have added numerous projects throughout the text.
4. Deleting CAD icons and applications throughout the existing text. In this edition, Chapter 2 covers CAD equipment including processing and storage equipment, input equipment, and output equipment. Other chapters feature basic CAD commands pertaining to a particular topic, following the information on manual drafting.
5. Continuing to use the unit approach to teach the subject matter. Reviewers find this approach to be a real bonus. It allows them to readily put together a customized program that suits the needs of their students and local industry by choosing the appropriate units. This edition continues to divide chapters into mini-teaching units.

6. Continuing to cover current ANSI and ISO drawing practices better than every other text. It is a basic requirement of any engineering drawing text to keep the instructors aware of the latest drawing standards and practices. In this edition, we again included the latest drawing standards on:

- Methods of representation (Unit 6–1)
- Symbols representation for installed rivets used in aerospace equipment (Unit 11–5)
- Simplified representation on drawing (Unit 14–1), a new standard being prepared by ISO and ANSI

These simplified representations have been used for years by American industries as a cost-saving feature. They are covered in this edition of *Fundamentals of Engineering Drawing* as they have been since the second edition.

In addition to the major changes incorporated from the reviewers' recommendations, this edition also provides other new features including key terms and a new two-color design. Each chapter begins with the important terms and their definitions. The new two-color design is used to highlight the text's features and enhance its appearance.

Fundamentals of Engineering Drawing, 4th edition is supported by ancillary products:

- *Instructor's Management System.* This comprehensive solutions manual details solutions to many of the end-of-chapter drawing problems. It provides instructors with course objectives, instructional tips, teaching transparencies, and chapter tests.
- *Problems Workbook for Fundamentals of Engineering Drawing.* Many of the reviewers suggested that we include a problems workbook to enable their students to have more practice. A correlated problems workbook is now available.

Comments and suggestions concerning this and future editions of the text are most welcomed.

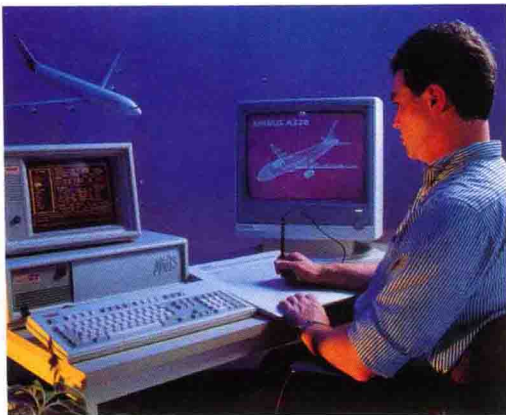
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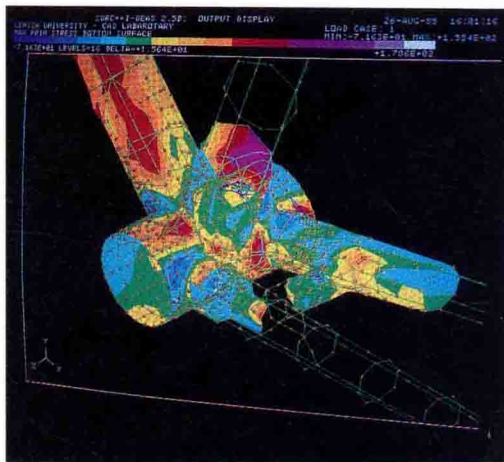
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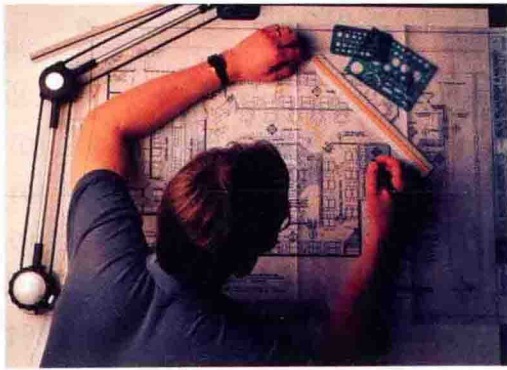
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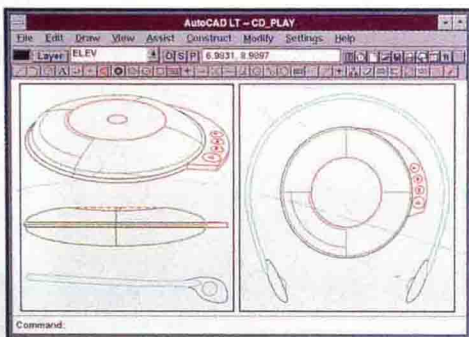
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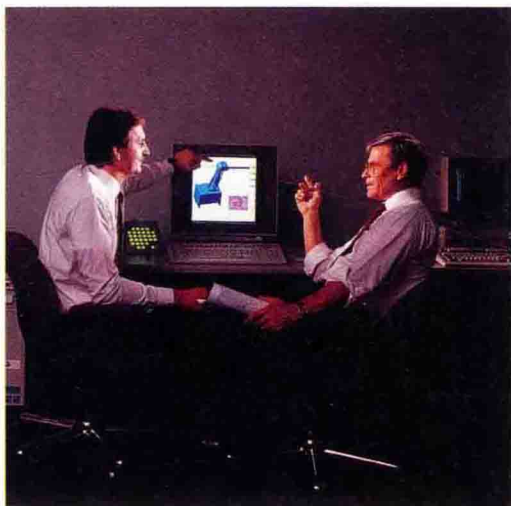
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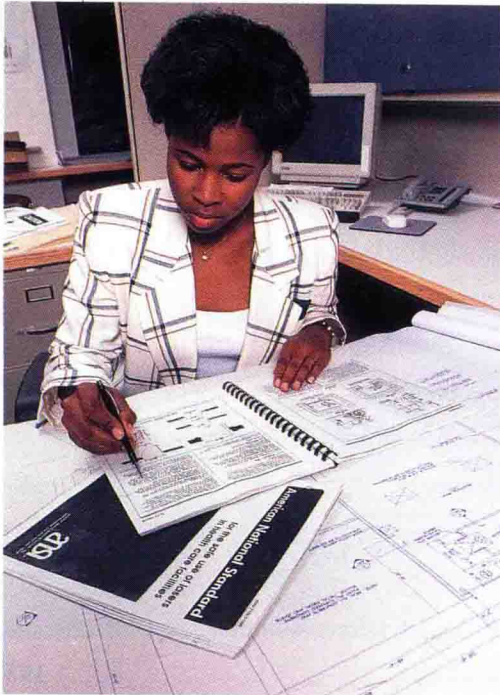




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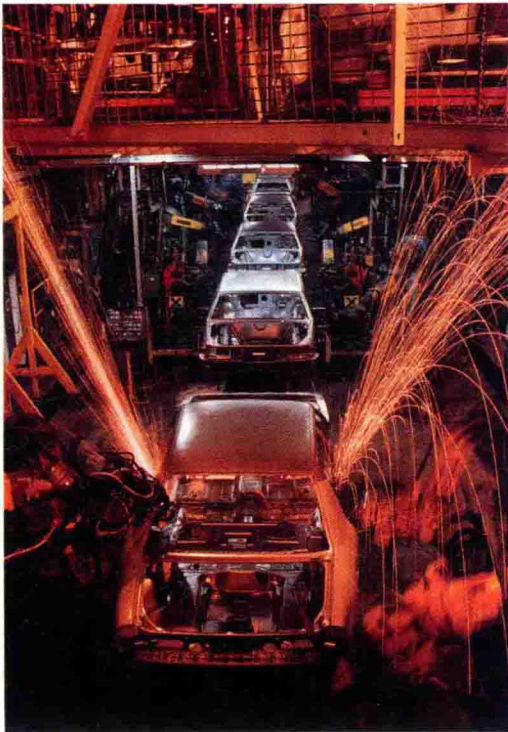
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