

# Introduction

As former drafting technology instructors at an Autodesk Premier Authorized Training Center for AutoCAD, we have written the textbook and this instructor's resource from an instructor's viewpoint. In doing so, we have tried to provide instructional aids that will help you develop meaningful courses with minimal effort. This instructor's resource was prepared to help you plan and teach effective AutoCAD courses. Please take a few minutes to scan its contents. In addition to answers for the chapter exercises, review questions, and problems, it contains syllabi and outlines for various types of courses. Also included are sample course exams and a sample certification exam for Autodesk's AutoCAD Certified Professional Exam. The information provided in this instructor's resource should help with the many problems that may arise when working with complex equipment and software.

## Tips for Instructors

If you are just starting to develop a computer-aided drafting class, you may soon encounter a new batch of problems that accompany the introduction of computers and software into the classroom. Be aware that issues you did not have to deal with in a manual drafting environment will arise. The best prevention for any problems, especially those related to computers, is to know your equipment and software, and to be as organized as possible.

As you organize and develop CAD courses, you should establish operating procedures and set standards. Keep the following tips in mind:

- Try to keep each student on the same machine throughout the course.
- Have students make their own hard drive folder or a folder on a network drive. Have students save files to the folder they create or to removable media, such as a USB drive.
- Make a list of all programs and files needed on each computer. Keep the list in your office or in a notebook at each workstation.
- Perform regular hard drive maintenance and management operations, such as defragmenting files and deleting unnecessary files and programs.
- Only install software that is properly licensed and only on the number of machines for which it is licensed. Violation of a licensing agreement is illegal.
- Establish a consistent and meaningful file-naming system for each class you teach. Use file names of consistent length to make file maintenance easier. Be sure your students follow the system.
- At the end of each term, semester, or training session, instruct your students to back up their files onto portable storage media. Then have them delete the files in their local hard drive folder or the network drive. Remove the folders of students who will not return for the next term.
- Provide plenty of review questions and exercises.
- Conserve the use of plotter paper and equipment. Try to grade drawings electronically when possible, either on removable media or network drives. Have students create a layer named **Correct** and place notes and corrections on that layer.
- Give open-book tests. Allow students to use the computer and their notes when taking tests. This reinforces computer skills and encourages the students to use available reference materials.

# Industry Relevance

*AutoCAD and Its Applications—Basics* is an excellent training aid for individuals and for classroom instruction. The textbook teaches AutoCAD and illustrates how it applies to common drafting tasks. The textbook is also an invaluable resource for any professional using AutoCAD.

With *AutoCAD and Its Applications—Basics*, your students not only master AutoCAD commands, but also learn the following:

- Office practices for firms using computer-aided design systems.
- Use of preliminary procedures, sketches, and drawing plan sheets.
- Development of template drawings.
- Application of editing commands to create complex geometric constructions.
- Methods for laying out multiview drawings.
- Dimensioning practices as interpreted through accepted standards.
- Construction of section views and use of hatch patterns.
- Guidelines for creating, using, and managing symbol libraries.

# How to Use the Textbook

*AutoCAD and Its Applications—Basics* provides students with complete instruction on mastering AutoCAD commands and applying skills to drafting tasks consistent with accepted standards. The topics are covered in an easy-to-learn sequence. The textbook begins with an introduction to computer-aided drafting. Learning then progresses in a format that allows students to become comfortable with the commands as their knowledge builds from one chapter to the next.

The textbook contains many features to enhance learning. Features of the textbook include the following:

- Key terms are identified with their definitions in the margin.
- Drafting standards and practices are presented throughout to reinforce AutoCAD applications.
- Exercises are referenced after important sections in each chapter and can be accessed from the companion website. The exercises provide hands-on experience while breaking the material into smaller learning segments.
- References to the Supplemental Material and Reference Material documents on the companion website direct students to more information about discussion topics.
- Chapter reviews allow students to reinforce their knowledge of commands and key AutoCAD concepts.
- End-of-chapter problems are often given as actual industrial prints or engineering sketches. These require that students apply all skills learned through the current chapter.
- Template development content is referenced where appropriate throughout the textbook. This content can be accessed from the companion website.
- Five dimensioning chapters provide thorough coverage of dimensioning. The dimensioning chapters cover dimension styles and standards, linear and angular dimensioning, dimensioning features and alternate dimensioning, dimensioning with tolerances, and editing dimensions. A section on geometric dimensioning and tolerancing is included on the companion website.

When working through the textbook, students will see a variety of notices in the chapters. These notices include Professional Tips, Notes, and Cautions that help students develop their AutoCAD skills. An example of each is shown.

### PROFESSIONAL TIP

These ideas and suggestions are aimed at increasing productivity and enhancing the use of AutoCAD commands and techniques.

### NOTE

A note alerts the student to important aspects of the command, function, or activity being discussed. The student should keep these aspects in mind while working through the text.

### CAUTION

A caution alerts the student to potential problems if instructions or commands are used incorrectly or if an action could corrupt or alter computer files, folders, or drives. If students are in doubt after reading a caution, they should always consult you or the appropriate CAD or IT manager.

## Companion Website

The companion website is located at [www.g-wlearning.com/CAD/](http://www.g-wlearning.com/CAD/). Select the entry for *AutoCAD and Its Applications—Basics* to access the material for the textbook.

References to content on the companion website appear throughout the textbook. Before you begin teaching AutoCAD with this teaching package, take a few minutes to look through the supplemental and reference materials found on the companion website. The reference materials include information about ANSI/ASME drafting symbols and drafting standards. Also included on the companion website are detailed guidelines for developing AutoCAD drawing templates. When you are aware of the vast amount of reference information found on the companion website, you will be able to use *AutoCAD and Its Applications—Basics* to teach AutoCAD more effectively.

## Fonts Used in the Text

Different typefaces are used throughout each chapter in the text to define terms and identify AutoCAD commands. Important terms appear in ***bold-italic face, serif*** type. AutoCAD menus, commands, system variables, dialog box names, toolbar names, and toolbar button names appear in **boldface, sans serif** type. File names, folder names, paths, and keyboard entry items appear in the body of the text in Roman, sans serif type. Keyboard keys are shown inside square brackets [ ] and appear in Roman, sans serif type. For example, [Enter] means to press the Enter key. In addition, commands, menus, and dialog boxes related to Microsoft Windows appear in Roman, sans serif type.

Prompt sequences are set apart from the body text with space above and below and appear in Roman, sans serif type. Keyboard entry items in prompts appear in **boldface, sans serif** type. In prompts, the [Enter] key is represented by the ↵ symbol.

## Introducing AutoCAD Commands

There are several ways to select AutoCAD drawing and editing commands. Selecting commands from the ribbon or **Application Menu** is slightly different from entering them at the keyboard. AutoCAD commands and related options are introduced in the textbook by providing all commonly used entry methods. Have your students experiment with all entry methods to find the most convenient way for them to access commands.

The keyboard, ribbon, and **Application Menu** entry methods are also presented in the margin throughout the textbook. When a command is introduced, these methods are illustrated in the margin next to the text reference. The ribbon tab on which the button is located is also identified.

## Evaluation Methods

*AutoCAD and Its Applications—Basics* provides several ways for you to evaluate student performance. Student progress can be measured within chapter sections in the textbook and after the completion of each chapter. The exercises, review questions, and drawing problems in each chapter are set up to allow you to select individual or group learning goals.

- **Exercises.** References to exercises on the companion website are located throughout each chapter. Each exercise is composed of step-by-step instructions. These exercises help students become acquainted with commands at their own pace.
- **Chapter Reviews.** Each chapter includes review questions. Questions may require students to provide the proper command, option, or response to perform a certain task.
- **Drawing Problems.** A variety of drafting and design problems are provided at the end of each chapter. These are presented as “real-world” CAD drawings, 3D illustrations, or engineering sketches. The problems are designed to make students think, solve problems, use design techniques, research, and use proper drafting standards.

Each drawing problem deals with one of seven technical disciplines. Although doing all of the problems will allow students to enhance their AutoCAD skills, you may have a particular discipline on which you wish your students to focus. The discipline a problem addresses is indicated by a label next to the problem number.

## Prerequisites

The only prerequisite to using the textbook is an interest in AutoCAD. *AutoCAD and Its Applications—Basics* takes the student through the entire AutoCAD command structure and applies AutoCAD functions to basic drafting concepts and standards. While prior experience with Microsoft Windows is helpful, it is by no means a requirement.

# Checking the AutoCAD Online Documentation

No other reference should be needed when using the text. However, the AutoCAD online documentation, or help system, may provide a different perspective on a command explanation. The online documentation provides an alphabetical listing of AutoCAD commands and system variables and other help resources. The search function of the online documentation is a powerful feature for students to use when seeking information about specific topics.

## Special Instructions and Considerations

The best way to learn any computer program effectively is to sit at the computer and use it. There is no substitute for practice. Establish a regular schedule of computer time and have students stick to it. An effective method of learning AutoCAD with *AutoCAD and Its Applications—Basics* is for students to read the book while sitting at a computer and follow along with the commands, explanations, and discussions. Working through the exercises in each chapter reinforces the material and allows your students to immediately apply it to a drawing.

Students who study the book without benefit of a computer should make notes about the commands or techniques they do not understand or cannot visualize. They should then focus on those areas when they have access to a computer.

## Instructor's Resources

The teaching resources available in this instructor's resource include sample course syllabi, chapter-specific content and answer keys for the textbook, drawing problem solutions in DWG format, final exams, and a sample AutoCAD certification exam for Autodesk's Professional certification level.

### Course Syllabi

AutoCAD courses take on various structures depending on the instructional facility, the learner, and you, the instructor. You can use or revise the sample syllabi to suit individual classroom needs. General explanations of the courses outlined by these sample syllabi are given in the next sections.

### Long-Term Program

This format is designed for certificate or degree programs that run in a semester or quarter format. There are two courses:

- Computer-Aided Drafting I
- Computer-Aided Drafting II

Chapter assignments from the textbook are provided, along with additional ideas and suggestions. A final exam is also provided for each course.

## Short-Term Program

This format is designed for short-term training programs that target AutoCAD professional upgrade skills. Each course is designed for short, intense training offered in programs such as Autodesk Authorized Training Centers, where the length of each course is approximately 32 hours. There are two courses:

- AutoCAD Level I
- AutoCAD Level II

## Chapter Objectives and Answer Keys

The answers and solutions for the textbook exercises, chapter reviews, and drawing problems are provided. Learning objectives are listed for each chapter.

## Final Exams and Answers

Final exams corresponding to the Computer-Aided Drafting I and Computer-Aided Drafting II sample courses are available. The questions are similar to the chapter review questions in the textbook.

## Sample AutoCAD Certification Exam

The sample AutoCAD certification exam provided in this instructor's resource mimics the style used in Autodesk's AutoCAD Certified Professional Exam. The sample exam consists of 50 questions. AutoCAD drawing files for problems on the exam are provided. You will need to make the files available to students at the time of testing. Students are required to access the files and perform an AutoCAD task correctly. After students complete each drawing problem, they must answer a question about the drawing.

The actual AutoCAD Certified Professional Exam is a 2-hour timed exam consisting of 35 questions. You may wish to make student experience more realistic by imposing a similar time limit when you administer the practice exam.

# Please Let Us Hear from You

If you find something in the textbook or instructor's resource that is not clear, or if you feel that a technique, professional tip, or explanation is missing, we want to hear from you. Please e-mail your findings or suggestions to [custserv@g-w.com](mailto:custserv@g-w.com). Your input will help make the textbook a better teaching tool for you and your students.