Table of Contents

Dedication iii
Preface xvii

Chapter 1: Adding Constraints to Sketches

Introduction 1-2
Adding Geometric Constraints 1-2
Applying the Horizontal Constraint 1-2
Applying the Vertical Constraint 1-3
Applying the Coincident Constraint 1-4
Applying the Fix Constraint 1-5
Applying the Perpendicular Constraint 1-5
Applying the Parallel Constraint 1-5
Applying the Collinear Constraint 1-6
Applying the Concentric Constraint 1-6
Applying the Tangent Constraint 1-7
Applying the Symmetric Constraint 1-7
Applying the Equal Constraint 1-8
Applying the Smooth Constraint 1-8
Controlling the Display of Constraints 1-8
Applying Constraints Automatically 1-13
Applying Dimensional Constraints 1-15
Converting a Dimensional Constraint into an Annotational Constraint 1-16
Concept of a Fully-Defined Sketch 1-16
Under-defined 1-17
Fully-defined 1-17
Over-defined 1-17
Controlling the Display of the Dimensional Constraint 1-18
Working with Equations 1-23
Adding Equations while Applying Dimensional Constraints 1-23
Adding Equations Using the Parameters Manager 1-24
Self-Evaluation Test 1-28
Review Questions 1-29

Chapter 2: Understanding External References

External References 2-2
Dependent Symbols 2-2
Managing External References in a Drawing 2-4
Attaching an Xref Drawing (Attach Option) 2-6
Detaching an Xref Drawing (Detach Option) 2-10

Evaluation Copy. Do not reproduce. For information visit www.cadcim.com

Updating an Xref Drawing (Reload Option) 2-11
Unloading an Xref Drawing (Unload Option) 2-11
Adding an Xref Drawing (Bind Option) 2-11
The Overlay Option 2-13
Attaching Files to a Drawing 2-18
Working with Underlays 2-18
Editing an Underlay 2-19
Opening an Xreffed Object in a Separate Window 2-21
Using the DesignCenter to Attach a Drawing as an Xref 2-21
Adding Xref Dependent Named Objects 2-22
Clipping External References 2-24
Displaying Clipping Frame 2-26
Demand Loading 2-27
Editing References In-Place 2-28
Self-Evaluation Test 2-30
Review Questions 2-30

Chapter 3: Working with Advanced Drawing Options

Understanding the Use of Multilines 3-2
Defining a Multiline Style 3-2
Drawing Multilines 3-7
Editing Multilines by Using Grips 3-8
Editing Multilines by Using Dialog Box 3-9
Cross Intersection (CC/OC/MC) 3-10
Tee Intersection (CT/OT/MT) 3-11
Corner Joint (CJ) 3-11
Adding and Deleting Vertices (AV/DV) 3-12
Cutting and Welding Multilines (CS/CA/WA) 3-12
Creating Revision Clouds 3-15
Rectangular Revision Cloud 3-16
Polygonal Revision Cloud 3-16
Freehand Revision Cloud 3-16
Creating Wipeouts 3-17
Creating NURBS 3-18
Editing Splines 3-21
Editing Splines using 3D Edit Bar 3-25
Markup Import and Markup Assist Features 3-26
DWG Compare 3-35
Self-Evaluation Test 3-40
Review Questions 3-40

Chapter 4: Grouping and Advanced Editing of Sketched Objects

Grouping Sketched Objects Using the Object Grouping Dialog Box 4-2
Grouping Sketched Objects Using the Group Button 4-7
Selecting Groups 4-7
Changing Properties of an Object 4-8

Evaluation Copy. Do not reproduce. For information visit www.cadcim.com

Exploding Compound Objects 4-14
Editing Polylines 4-15
Editing Single Polyline 4-16
Editing Multiple Polylines 4-30
Undoing Previous Commands 4-32
Reversing the Undo Operation 4-36
Renaming Named Objects 4-37
Removing Unused Named Objects 4-38
Purgeable items Tab 4-38
Find non-Purgeable items Tab 4-39
Setting Selection Modes Using the Options Dialog Box 4-40
Self-Evaluation Test 4-44
Review Questions 4-44

Chapter 5: Working with Data Exchange & Object Linking and Embedding

Understanding the Concept of Data Exchange in AutoCAD 5-2
Creating Data Interchange (DXF) Files 5-2
Creating a Data Interchange File 5-2
Information in a DXF File 5-3
Converting DXF Files into Drawing Files 5-4
Importing CAD Files 5-4
Other Data Exchange Formats 5-4
DXB File Format 5-4
Creating and Using an ACIS File 5-5
Importing PDF Files 5-5
Importing 3D Studio Files 5-8
Creating and Using a Windows Metafile 5-8
Creating and Using a V8 DGN File 5-9
Creating a BMP File 5-9
Raster Images 5-9
Attaching Raster Images 5-10
Managing Raster Images 5-12
Editing Raster Image Files 5-14
Clipping Raster Images 5-14
Adjusting Raster Images 5-16
Modifying the Image Quality 5-16
Modifying the Transparency of an Image 5-17
Controlling the Display of Image Frames 5-17
Changing the Display Order 5-18
Other Editing Operations 5-18
Scaling Raster Images 5-19
DWG Convert 5-19
Conversion Setup Options 5-20
Working with PostScript Files 5-24
Object Linking and Embedding (OLE) 5-26
Sharing Drawing Views 5-34

Evaluation Copy. Do not reproduce. For information visit www.cadcim.com

Self-Evaluation Test 5-39
Review Questions 5-40

Chapter 6: The User Coordinate System

The User Coordinate System (UCS) 6-2
Controlling the Visibility of the UCS Icon 6-3
Defining the New UCS 6-5
Managing the UCS through the Dialog Box 6-21
System Variables 6-25
Self-Evaluation Test 6-25
Review Questions 6-26

Chapter 7: Getting Started with 3D

Starting Three Dimensional (3D) Modeling in AutoCAD 7-2
Use of Three-dimensional Drawing 7-2
Types of 3D Models 7-3
    Wireframe Models 7-3
    Surface Models 7-4
    Solid Models 7-4
Conventions Followed in AutoCAD 7-5
Changing the Viewpoint to View 3D Models 7-6
    Changing the Viewpoint Using the ViewCube 7-7
    Changing the Viewpoint Using the Ribbon or the Toolbar 7-8
    Changing the Viewpoint Using the Viewpoint Presets Dialog Box 7-10
    Changing the Viewpoint Using the -VPOINT Command 7-12
In-Canvas Viewport Control 7-15
3D Coordinate Systems 7-17
Direct Distance Entry Method 7-21
Trim, Extend, and Fillet Tools 7-24
Setting Thickness and Elevation for New Objects 7-24
    The ELEV Command 7-24
Suppressing the Hidden Edges 7-26
Creating a 3D Polyline 7-27
Converting Wireframe Models into Surface Models 7-27
    Creating 3D Faces 7-27
    Creating Polyface Meshes 7-28
    Controlling the Visibility of the 3D Face Edges 7-30
Creating Planar Surfaces 7-30
The 3DMESH Command 7-31
Editing the Surface Mesh 7-31
    The Edit Polyline Tool 7-31
Dynamic Viewing of 3D Objects 7-34
    Using the SteeringWheels 7-34
    Dynamically Rotating the View of a Model 7-37
    Clipping the View of a Model Dynamically 7-45

Evaluation Copy. Do not reproduce. For information visit www.cadcim.com

Nudge Functionality 7-46
Self-Evaluation Test 7-47
Review Questions 7-48

Chapter 8: Creating Solid Models

What is Solid Modeling? 8-2
Creating Predefined Solid Primitives 8-2
Creating a Solid Box 8-3
Creating a Solid Cone 8-5
Creating a Solid Cylinder 8-8
Creating a Solid Sphere 8-9
Creating a Solid Torus 8-9
Creating a Solid Wedge 8-10
Creating a Pyramid 8-11
Creating a Polysolid 8-12
Creating a Helix 8-15
Modifying the Visual Styles of Solids 8-17
Creating Complex Solid Models 8-27
Creating Regions 8-27
Creating Complex Solid Models by Applying Boolean Operations 8-27
Combining Solid Models 8-27
Subtracting One Solid From the Other 8-28
Intersecting Solid Models 8-28
Checking Interference in Solids 8-29
Dynamic UCS 8-35
Defining the New UCS Using the ViewCube and the Ribbon 8-36
Creating Extruded Solids 8-36
Extruding along the Normal 8-37
Extruding with a Taper Angle 8-37
Extruding along a Direction 8-38
Extruding along a Path 8-38
Extruding using Expressions 8-39
Creating Revolved Solids 8-39
Creating Swept Solids 8-40
Creating Lofted Solids 8-44
Creating Presspull Solids 8-55
Self-Evaluation Test 8-65
Review Questions 8-65

Chapter 9: Editing 3D Objects-I

Filleting Solid Models 9-2
Chamfering Solid Models 9-3
Rotating Solid Models in 3D Space 9-4
Rotating Solid Models about an Axis 9-7
Mirroring Solid Models in 3D Space 9-8

Evaluation Copy. Do not reproduce. For information visit www.cadcim.com

Moving Models in 3D Space 9-14
Creating Arrays in 3D Space 9-15
Aligning Solid Models 9-17
Aligning Solids by Defining an Alignment Plane 9-19
Extracting Edges of a Solid Model 9-21
Converting Objects to Surfaces 9-21
Converting Objects to Solids 9-22
Converting Surfaces to Solids 9-23
Point Cloud 9-23
    Attaching the Point Cloud 9-23
Slicing Solid Models 9-25
Creating the Cross-Sections of Solids 9-29
Self-Evaluation Test 9-33
Review Questions 9-34

Chapter 10: Editing 3D Objects-II

Editing Solid Models 10-2
    Editing Faces of a Solid Model 10-2
    Editing Edges of a Solid Model 10-7
    Editing Entire Body of a Solid Model 10-10
Generating a Section by Defining a Section Plane 10-13
Solid History 10-19
Generating Drawing Views of a Solid Model 10-20
    Solid View 10-21
    Solid Drawing 10-23
    Solid Profile 10-24
Drawing Views 10-24
    Base 10-24
    Projected View 10-26
    Edit View 10-27
    Update View 10-27
    Auto Update 10-27
    Drafting Standard 10-28
    Generating Section Views 10-28
Creating Flatshot 10-33
Calculating the Mass Properties of Solid Models 10-36
Recording the Drawing Steps by Using the Action Recorder 10-38
Using ShowMotion for Presentation 10-40
    Playing the Animation 10-42
Self-Evaluation Test 10-42
Review Questions 10-43

Chapter 11: Surface Modeling

Surface Modeling 11-2
Creating Wireframe Elements 11-2

Evaluation Copy. Do not reproduce. For information visit www.cadcim.com

Spline CV 11-2
Spline Fit 11-3
Spline Freehand 11-3
Extract Isoline Curves 11-4
Creating Surfaces by Using Profiles 11-4
Creating an Extruded Surface 11-4
Creating a Revolved Surface 11-6
Creating a Loft Surface 11-7
Creating a Sweep Surface 11-7
Creating a Planar Surface 11-7
Creating a Network Surface 11-8
Creating Surfaces from other Surfaces 11-8
Creating a Blend Surface 11-9
Creating a Patch Surface 11-10
Creating an Offset Surface 11-12
Editing Surfaces 11-13
Creating Fillets 11-13
Trimming Surfaces 11-14
Untrimming Surfaces 11-16
Extending Surfaces 11-17
Sculpting Surfaces 11-18
Extracting Intersections 11-18
NURBS Surfaces 11-30
Projecting Geometries 11-34
Performing Surface Analysis 11-43
Zebra 11-44
Analysis Curvature 11-45
Analysis Draft 11-46
Self-Evaluation Test 11-47
Review Questions 11-47

Chapter 12: Mesh Modeling

Introduction 12-2
Creating Mesh Primitives 12-2
Creating a Mesh Box 12-2
Creating Surface Meshes 12-5
Creating Revolved Surface Meshes 12-5
Creating Edge Surface Meshes 12-7
Creating Ruled Surface Meshes 12-8
Creating Tabulated Surface Meshes 12-9
Modifying Mesh Objects 12-11
Adding Smoothness to Meshes 12-11
Refining the Meshes 12-14
Adding Crease to Meshes 12-16
Editing Mesh Faces 12-17
Splitting the Mesh Faces 12-17
Extruding the Mesh Faces 12-18

Evaluation Copy. Do not reproduce. For information visit www.cadcim.com

Merging the Mesh Faces 12-19
Closing the Gaps 12-19
Collapsing the Mesh Vertices 12-20
Spinning the Edges of Triangular Faces 12-21
Converting Mesh Objects 12-27
Converting Mesh Objects into Solids 12-27
Converting Mesh Objects into Surfaces 12-29
Working with Gizmos 12-31
Move Gizmo 12-31
Rotate Gizmo 12-32
Scale Gizmo 12-32
Self-Evaluation Test 12-42
Review Questions 12-43

Chapter 13: Rendering and Animating Designs

Understanding the Concept of Rendering 13-2
Assigning Materials 13-2
Materials Browser 13-3
Assigning Selected Materials to Objects 13-5
Attaching Material by Layers 13-6
Creating and Editing Materials 13-6
Basic Rendering 13-9
Creating New Materials 13-10
Mapping Materials on Objects 13-16
Converting Materials Created in Previous AutoCAD Release into AutoCAD 2026 Format 13-20
Adding Lights to the Design 13-21
Default Light 13-21
Point Light 13-23
Spotlight 13-32
Distant Light 13-33
Web Light 13-34
Sun Light 13-35
Converting Lights Created in AutoCAD's Previous Release into AutoCAD 2026 Format 13-43
Modifying Lights 13-43
Understanding Rendering Presets 13-44
Controlling the Rendering Environment 13-47
Rendering with a Background 13-47
Adjusting the Lighting Exposure to Rendered Image 13-48
Rendering a Model with Different Render Settings 13-48
Obtaining Rendering Information 13-51
Saving a Rendered Image 13-51
Saving the Rendered Image to a File 13-51
Saving the Viewport Rendering 13-52
Saving the Rendered Image from the Render Window 13-52
Plotting Rendered Images 13-53

Evaluation Copy. Do not reproduce. For information visit www.cadcim.com

Unloading AutoCAD Render 13-53
Working with Cameras 13-53
Create Camera 13-53
Editing the Cameras 13-56
Creating Animations 13-57
Creating Animation of 3D Navigations 13-57
Creating Animation by Defining the Path of the Camera Movement 13-58
Self-Evaluation Test 13-64
Review Questions 13-64

Chapter 14: Hyperlinks and 3D Printing

Introduction 14-2
BROWSER 14-2
HYPERLINK 14-2
HYPERLINKFWD 14-2
HYPERLINKBACK 14-2
HYPERLINKSTOP 14-2
PASTEASHYPERLINK 14-2
HYPERLINKBASE 14-2
Internet Commands 14-2
Understanding URLs 14-3
Launching a Web Browser 14-4
Changing the Default Website 14-5
Using Hyperlinks with AutoCAD 14-5
Pasting as Hyperlink 14-12
Editing Hyperlinks 14-12
Removing Hyperlinks from Objects 14-12
The Drawing Web Format 14-12
Creating a DWF File 14-13
3D Printing 14-22
Self-Evaluation Test 14-26
Review Questions 14-27

Chapter 15: Script Files and Slide Shows

What Are Script Files? 15-2
Running Script Files 15-4
Repeating Script Files 15-10
Introducing Time Delay in Script Files 15-11
Resuming Script Files 15-12
Command Line Switches 15-12
Running a Script File while Loading AutoCAD 15-12
What is a Slide Show? 15-22
What are Slides? 15-22
Creating Slides 15-23
Viewing Slides 15-24
Preloading Slides 15-26

Evaluation Copy. Do not reproduce. For information visit www.cadcim.com

Slide Libraries 15-28
Self-Evaluation Test 15-32
Review Questions 15-33

Chapter 16: Creating Linetypes and Hatch Patterns

Standard Linetypes 16-2
Linetype Definitions 16-2
Elements of Linetype Specification 16-3
Creating Linetypes 16-3
Alignment Specification 16-9
LTSCALE Command 16-10
LTSCALE Factor for Plotting 16-12
Current Linetype Scaling (CELTSCALE) 16-13
Alternate Linetypes 16-14
Modifying Linetypes 16-15
Complex Linetypes 16-18
Creating a String Complex Linetype 16-18
Hatch Pattern Definition 16-27
How Hatch Works? 16-30
Simple Hatch Pattern 16-30
Effect of Angle and Scale Factor on Hatch 16-32
Hatch Pattern with Dashes and Dots 16-33
Hatch with Multiple Descriptors 16-35
Saving Hatch Patterns in a Separate File 16-40
Custom Hatch Pattern File 16-40
Self-Evaluation Test 16-42
Review Questions 16-43

Chapter 17: Customizing the acad.pgp File

What is the acad.pgp File? 17-2
Sections of the acad.pgp File 17-9
Reinitializing the acad.pgp File 17-10
Self-Evaluation Test 17-13
Review Questions 17-13

Chapter 18: Conventional Dimensioning and Projection Theory Using AutoCAD

Dimensioning 18-2
Dimension Units 18-2
Dimensioning Components 18-4
Common Rules for Dimensioning 18-5
Working Drawings 18-15
    Detail Drawing 18-15
    Assembly Drawing 18-16

Evaluation Copy. Do not reproduce. For information visit www.cadcim.com

Bill of Materials 18-17
Multiview Drawings 18-18
Understanding the X, Y, and Z Axes 18-19
Orthographic Projections 18-19
Positioning Orthographic Views 18-23
Sectional Views 18-23
Full Section 18-29
Half Section 18-30
Broken Section 18-31
Revolved Section 18-31
Removed Section 18-32
Offset Section 18-32
Aligned Section 18-34
Cutting Plane Lines 18-34
Spacing for Hatch Lines 18-35
Direction of Hatch Lines 18-37
Points to Remember 18-37
Auxiliary Views 18-38
Self-Evaluation Test 18-47
Review Questions 18-48

CHAPTERS AVAILABLE FOR FREE DOWNLOAD

In this textbook, one chapter is available for free download. You can download this chapters from our website *www.cadcim.com*. *Textbooks > CAD/CAM > AutoCAD Advanced > Advanced AutoCAD 2026 with Videos: A Problem-Solving Approach, 3D and Advanced > Chapters for Free Download.* Next, click on the chapter name that you want to download.

Chapter 19: Isometric Drawings

Isometric Drawings 19-2
Isometric Projections 19-3
Isometric Axes and Planes 19-3
Setting the Isometric Grid and Snap 19-4
Drawing Isometric Circles 19-8
Creating Fillets in Isometric Drawings 19-9
Dimensioning Isometric Objects 19-10
Isometric Text 19-11
Self-Evaluation Test 19-12
Review Questions 19-13

Evaluation Copy. Do not reproduce. For information visit www.cadcim.com

PROJECT AVAILABLE FOR FREE DOWNLOAD

In this textbook two projects have been given for free download. You can download these chapters from our website *www.cadcim.com*. To download these chapters, follow the given path: *Textbooks > CAD/CAM > AutoCAD Advanced > Advanced AutoCAD 2026 with Videos: A Problem-Solving Approach, 3D and Advanced > Projects for Free Download* and then click on the required file.

Student Project 1 SP-1
Student Project 2 SP-5

Index **I-1**

Evaluation Copy. Do not reproduce. For information visit www.cadcim.com