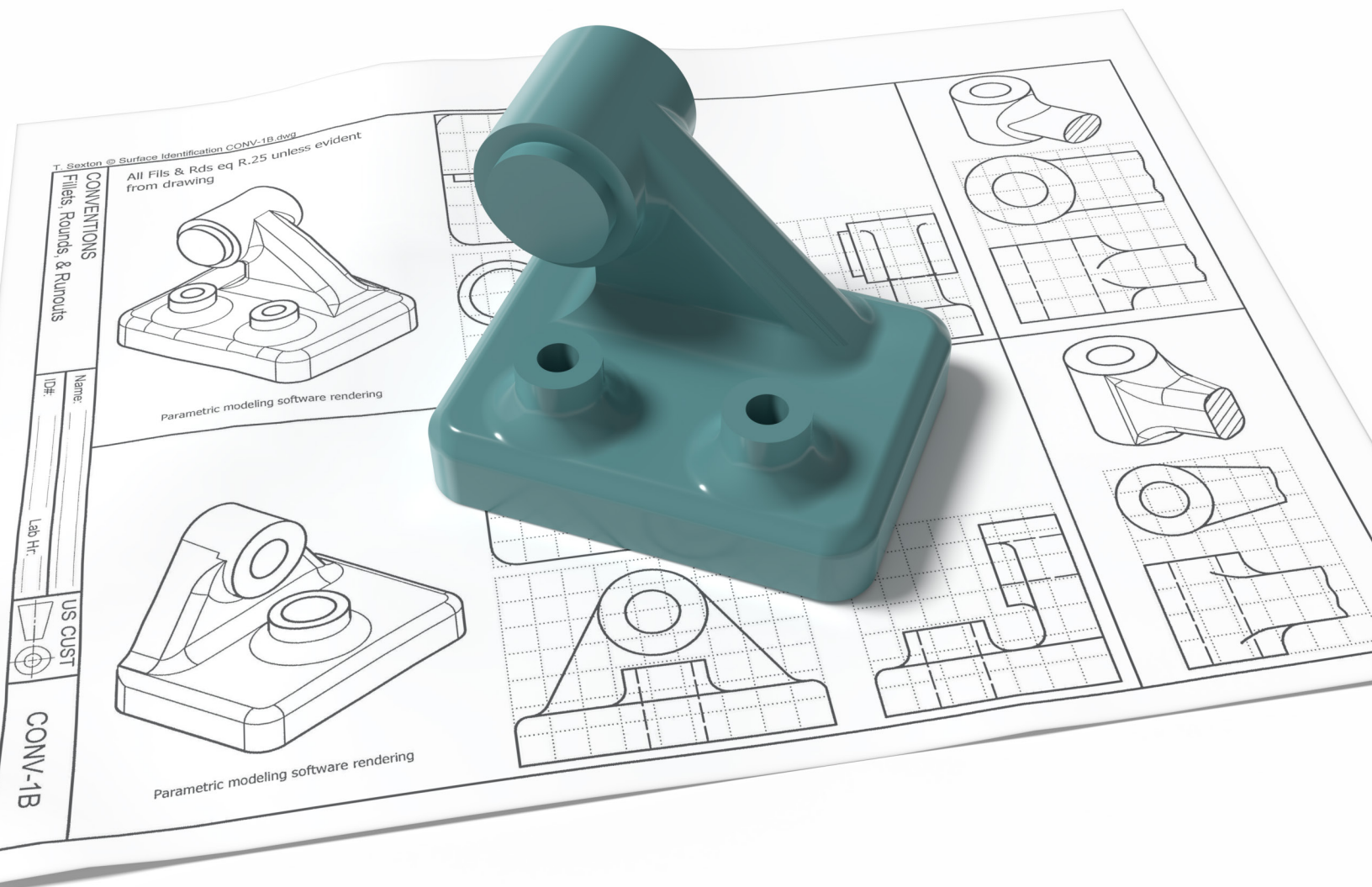


Includes
Video Lectures & Digital
Copy of Technical Graphics

A Concise Introduction to Engineering Graphics

Including Worksheet Series B

Sixth Edition



Timothy J. Sexton

Visit the following websites to learn more about this book:



[amazon.com](https://www.amazon.com)

[Google books](https://books.google.com)

[BARNES & NOBLE](https://www.barnesandnoble.com)

Table of Contents:

<i>Table of Contents:</i>	<i>i</i>
<i>Table of Problems:</i>	<i>vi</i>
<i>Teaching Resources:</i>	<i>vii</i>
Chapter 1	1
<i>Sketching Techniques & Materials</i>	<i>1</i>
Equipment:	1
Straight Lines:	1
Sketching Arcs and Circles:	2
Sketching to Scale:	3
Drafting Materials:	3
Paper:	3
Pencil lead:	3
Chapter 2	5
<i>Hand Lettering</i>	<i>5</i>
Chapter 3	7
<i>Multiview Drawing</i>	<i>7</i>
The Engine of Industry:	7
Orthographic Projection:	7
The Six Plastic Planes of Projection:	8
2-D Planes:	9
Types of Planes:	10
Normal Planes:	10
Inclined Planes:	10
Oblique Planes:	11
Single Curved Surfaces:	11
Line and Surfaces:	12
Circles vs. Ellipses:	12
Fillet and Rounds:	13
Fillet and Rounds in Castings:	14
Forming Fillets & Round Using Bended Metal:	15
3-D Parametric Models:	16
Intersecting Surfaces Using Fillets, Rounds, and Runouts:	16
Rounded Shapes Intersecting Cylinders:	17
Intersecting Planar Surfaces:	18
Angle Blocks:	18
Conventional Edges:	18
3 rd Angle vs. 1 st Angle Projection:	19
Chapter 4	21
<i>Isometric Drawing</i>	<i>21</i>
Why Isometric Drawing?	21
Isometric Projection Theory:	22
Constructing an Isometric Sketch:	23
Isometric Drawing vs. Isometric Projection:	24
Inclined and Oblique Surface:	25
Isometric Circles and Arcs	26

Table of Contents

Approximation Method:	27
Sketching an Isometric Circle:	28
Isometric Elliptical Templates:.....	29
Isometric Irregular Curves:	30
Chapter 5	31
<i>Line Types</i>	31
Drawing Line Types:.....	31
Hierarchy of Lines:.....	32
Hidden Line Technique:.....	33
Chapter 6	35
<i>Auxiliary Views</i>	35
Visualizing a Primary Auxiliary View:.....	35
Full vs. Partial Auxiliary Views	36
Type of Primary Auxiliary Views	37
Reverse Construction:	38
Successive Auxiliaries:.....	38
Dihedral Angles:	39
Chapter 7	41
<i>Sectional Views</i>	41
Sectional Views:.....	41
Cutting Plane Line:.....	42
Section Lining:	42
Full Sections:.....	44
Offset Sections:	45
Half Sections:	46
Revolved Sections:	47
Removed Sections:.....	48
Broken- out Sections:	49
Auxiliary Sections and Viewing Planes:	50
Aligned Sections:	50
Unsectioned Features:	52
Conventional Breaks:	53
Chapter 8	55
<i>Measurement & Scale</i>	55
Full Size Metric Measurement:	55
Full Size US Customary:.....	55
Scale:.....	55
Scales:	56
Civil Engineering Scale:.....	56
Mechanical Engineering Scales:.....	57
Architectural Scales:	57
Metric Scales:.....	58
Bar Scales:.....	59
Chapter 9	61
<i>Dimensioning</i>	61
Why Dimension?.....	61
Dimensioning Line Types, Terminology, and Symbols:.....	61

Table of Contents

Special Symbols:.....	62
Units of Measure:.....	62
Dimensioning Standards:.....	63
Dimensioning Strategy:.....	63
Unidirectional vs. Aligned:.....	63
Dimensioning Techniques:.....	64
Linear Dimensions:.....	67
Oblique Extension Lines:.....	68
Angular Dimensions:.....	68
Holes and Cylindrical Features:.....	68
Arcs and Radii:.....	70
Spheres and Rounded Cylinder Ends:.....	71
Rectangular Stock with Rounded Ends:.....	71
Slotted Holes:.....	72
Location Dimensions:.....	72
Holes Located About a Center Point:.....	73
Specifying Machining Operations:.....	73
Drilling and Reaming:.....	74
Counter Bore and Counter Sinks:.....	74
Chamfers:.....	76
Keyways and Keyseats.....	76
Necks and Undercuts:.....	77
Knurling:.....	78
Chapter 10.....	81
<i>General Tolerance</i>	81
Introduction:.....	81
What Determines the Tolerance?.....	81
Specifying Tolerance:.....	81
Mating Parts.....	82
ANSI Inch Based System of Limits & Fits.....	82
ISO System of Limits & Fits:.....	83
Metric Fit Symbols:.....	84
Terminology Review:.....	86
Chapter 11.....	89
<i>Geometric Dimensioning and Tolerancing (GD&T)</i>	89
Introduction:.....	89
Checking the size limits envelope:.....	90
Standard Stock Items:.....	91
Datums:.....	91
Order of Datums:.....	93
Datum axis:.....	95
Features at RFS:.....	95
Compound and Coplanar Datums:.....	97
Chain Lines and Partial Datum Surfaces:.....	98
Datum Target Points:.....	98
Datum Target Line:.....	99
Datum Target Area:.....	99
Geometric Dimensioning and Tolerancing (GD&T):.....	102
Feature Control Frame:.....	102
Geometric Characteristic Symbols:.....	103
Modifiers in a feature control frame:.....	104
Angularity:.....	105

Table of Contents

Parallelism:.....	106
Perpendicularity:	107
Straightness:	109
Straightness of Surface Elements:	109
Checking Surface Elements on a Cylinder:	109
Central Axis:	110
Geometric Tolerance Modifiers:	111
Flatness:.....	112
Flatness of a Specific Area:.....	113
Circularity:	113
Cylindricity:	115
Profile's Basic Concepts:	116
Profile of a Line:	116
Floating Tolerance Zone:	118
Profile of a Surface:.....	118
Profile of a Surface on a Spherical Radius or Planar Surface:	119
Profile of a Surface on a Conical Surface:	119
Profile All Around:.....	120
Limits of Application:	120
Positional Tolerance:.....	120
Positional Tolerance at MMC:	121
Composite Positional Tolerance:.....	122
Datums in the Second Line of a Composite Positional Tolerance:	123
Virtual Condition:	124
Concentricity:	125
Coaxial Control Using Positional Tolerance:.....	125
Symmetry:	126
Projected Tolerance Zone:.....	126
Runout:.....	127
Circular Runout:	127
Limited Application:	128
Total Runout:.....	128
Chapter 12.....	131
<i>Working Drawings</i>	131
Detail Working Drawings:	131
Assembly Drawings:	132
Exploded Isometric Assemblies:	132
Flow Lines:.....	134
Balloons:	134
General Sheet Layout:	134
Title Blocks:	135
List of Materials:	135
Revision Block:	136
General Notes Area:	137
Zone Markings:	137
Chapter 13.....	139
<i>Threads</i>	139
Thread Terminology:.....	139
Thread Profiles:	140
Unified Thread Series:.....	141
Metric Thread Series:	141
Class of Fit:	141

Table of Contents

Right vs. Left Hand Threads:	141
Multiple Threads:	141
Thread Representation	142
Inch Thread Specification:	144
Metric Thread Specification:.....	145
Gage Numbers in Thread Specifications:.....	145
Acme Thread Specification:.....	146
National Pipe Thread Specification:.....	146
Buttress Thread Specification:	146
Major Diameter:	146
Forming Threads:	147
Measuring Threads.....	149
Index:	151

Table of Problems:

Chapter 3

MULTIVIEW:

Surface Identification.....	MVS-1B
Normal Surfaces Sketching.....	MVN-1B
Normal Surfaces Sketching.....	MVN-2B
Normal Surfaces Sketching.....	MVN-3B
Inclined Surfaces Sketching.....	MVI-1B
Inclined Surfaces Sketching.....	MVI-2B
Oblique Surfaces Sketching.....	MVO-1B
Oblique Surfaces Sketching.....	MVO-2B

Chapter 4

MULTIVIEW / ISOMETRIC:

Normal Surfaces Sketching.....	ISMN-1B
Normal Surfaces Sketching.....	ISMN-2B
Normal Surfaces Sketching.....	ISMN-3B
Normal Surfaces Sketching.....	ISMN-4B
Inclined Surfaces Sketching.....	ISMI-1B
Inclined Surfaces Sketching.....	ISMI-2B
Inclined Surfaces Sketching.....	ISMI-3B
Oblique Surfaces Sketching.....	ISMO-1B
Oblique Surfaces Sketching.....	ISMO-2B
Curved Surfaces Sketching.....	ISMC-1B
Curved Surfaces Sketching.....	ISMC-2B
Curved Surfaces Sketching.....	ISMC-3B
Curved Surfaces Sketching.....	ISMC-4B
Fillet, Rounds, & Runouts.....	CONV-1B

Chapter 6

AUXILIARY VIEWS:

Auxiliary Views.....	AUX-1B
Auxiliary Views.....	AUX-2B

Chapter 7

SECTIONING:

Full Sections Sketching	SECF-1B
Full Sections	SECF-2B
Full Sections Sketching	SECF-3B
Full Sections Sketching	SECF-4B
Half Sections Sectioning.....	SECH-1B
Offset Sections Sketching.....	SECOF-1B
Broken Out Sections Sketching	SECBO-1B
Aligned Sections Sketching	SECAL-1B

Removed Sections Sketching .. SECR-1B

Chapter 8

MEASUREMENT and SCALE:

Architectural Scale.....	SCALEARB
Civil Engineering Scale	SCALECEB
Mechanical Engineering Scale.....	SCALEMEB
Metric Scale	SCALESIB

Chapter 9

DIMENSIONING:

Using CAD	DIM-1B
Sketching.....	DIM-2B
Sketching.....	DIM-3B
Sketching.....	DIM-4B
Using CAD.....	DIM-5B
Using CAD.....	DIM-6B

GEOMETRIC CONSTRUCTION:

2-D CAD	GC-BB
2-D CAD	GC-IB
2-D CAD	GC-AB

WORKING DRAWING:

2-D CAD	WD-1B
---------------	-------

PARAMETRIC MODEL:

3-D CAD	PARM-1B
---------------	---------