

Course Title: Introduction to Drafting Design

Unit 1:	Orientation
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Content Standard(s) and Depth of Knowledge Level(s):	<p>Students will:</p> <ol style="list-style-type: none"> 1. Relate the importance of drafting design technology in today’s technological work force.
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Learning Objective(s) and Depth of Knowledge Level(s):	<p>Students will:</p> <ol style="list-style-type: none"> 1. The students will relate the importance of drafting design technology in today’s technological work force.
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Essential Question(s):	Why is it important to communicate in a language that transcends spoken words and barriers?
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Content Knowledge	Suggested Instructional Activities Rigor & Relevance Framework (Quadrant)	Suggested Materials, Equipment and Technology Resources
I. Mechanical Prints II. Architectural Prints III. Machine Layouts IV. Development Plans V. Assembly Layout VI. Career Outlook	PowerPoint Presentation Discussion of Careers related to Drafting Design Technology Identify educational experiences and personal traits that benefit a drafter Describe potential barriers to career advancements and strategies for removing them	Software Computer Web sites Monitor LCD Projector

Unit Assessment:	Research Project, Career Aptitude
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Unit/Course CTSO Activity:	SkillsUSA community event, Leadership Conference & Competition
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Unit/Course Culminating Product:	Portfolio
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Course/Program Credential(s): Credential Certificate Postsecondary Degree University Degree
 Other: Can lead to Articulation with Drafting Design Technology in Postsecondary

Course Title: Introduction to Drafting Design

Unit 2:	Safety
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Content Standard(s) and Depth of Knowledge Level(s):	Students will: 2. Demonstrate the safe handling of drafting design tools according to classroom and environmental practices, procedures, and regulations.
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Learning Objective(s) and Depth of Knowledge Level(s):	Students will: 1. Follow general safety procedures. 2. Adjust equipment for maximum comfort and usability. 3. Describe ergonomic considerations.
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Essential Question(s):	What is the importance of complying with safety rules, regulations and procedures?
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Content Knowledge	Suggested Instructional Activities Rigor & Relevance Framework (Quadrant)	Suggested Materials, Equipment and Technology Resources
I. Safe use of computers II. Safe use of printer and/or plotter III. Safe use of paper cutter	Lecture Demonstration	Computer Software Printer LCD Projector

Unit Assessment:	Written test to be kept on file and demonstrate proper procedures to load paper into the plotter
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Unit/Course CTSO Activity:	SkillsUSA State Leadership Conference and Competition
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**Unit/Course
Culminating
Product:**

The student will regularly demonstrate proper safety rules and regulations throughout the entire course.

Course/Program Credential(s): Credential Certificate Postsecondary Degree University Degree
 Other: Can lead to Articulation with Drafting Design Technology in Postsecondary

Course Title: Introduction to Drafting Design

Unit 3:	Applied Mathematics for Drafting
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Content Standard(s) and Depth of Knowledge Level(s):	<p>Students will:</p> <p>3. Demonstrate mathematic skills related to drafting design, including basic fractions, scale reading, and conversion of customary to metric and metric to customary measurements.</p> <ul style="list-style-type: none"> • Solving higher-order mathematics applications Example: calculating thread depth and pitch • Calculating architectural computations Example: area, rise and run
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Learning Objective(s) and Depth of Knowledge Level(s):	<p>Students will:</p> <p>1. Students will demonstrate skills in mathematical concepts related to drafting design technology.</p> <ul style="list-style-type: none"> • Basic fractions • Reading fractional scales and measuring tools • Conversion of fractional/decimal measurements • Conversion of English/metric measurements • Additional higher-level math concepts as applicable Example: calculating thread depth and pitch • Architectural computations Examples: area, rise and run calculations • Apply reference materials and relevant mathematical formulas to assigned problems
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Essential Question(s):	What is the importance of demonstrating an understanding of mathematical concepts when working in a Global environment?
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Content Knowledge	Suggested Instructional Activities Rigor & Relevance Framework (Quadrant)	Suggested Materials, Equipment and Technology Resources
I. Numbers and Operations	Use fractions to solve practical problems	Textbooks
II. Algebra	Use proportions and ratios to solve practical problems	Handouts
III. Geometry	Simplify numerical expressions	Scales
IV. Measurement	Solve practical problems involving percents	Protractor
V. Problem Solving	Solve single variable algebraic expressions	Calculator
VI. Communication	Solve multiple variable algebraic expressions	Calipers
VII. Connections		

VIII. Representation	Measure angles Find surface area and perimeter of two dimensional objects Find volume and surface area of three dimensional objects Construct three-dimensional models Apply Pythagorean Theorem Make predictions using knowledge of probability Make comparisons, predictions and inferences using graphs and charts Organize and describe data using matrixes Graph linear equations Solve problems using proportions, formulas and functions Find slope of a line Solve practical problems involving complementary, supplementary and congruent angles Solve problems involving symmetry and transformation Use measures of interior and exterior angles of polygons to solve problems	
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Unit Assessment:	Written and Performance Test
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Unit/Course CTSO Activity:	Related Technical Math at SkillsUSA Alabama Leadership Conference and Competition
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Unit/Course Culminating Product:	Math Portfolio
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Course/Program Credential(s): <input type="checkbox"/> Credential <input type="checkbox"/> Certificate <input checked="" type="checkbox"/> Postsecondary Degree <input type="checkbox"/> University Degree <input type="checkbox"/> Other: Can lead to Articulation with Drafting Design Technology in Postsecondary
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Course Title: Introduction to Drafting Design

Unit 4:	Drafting Instruments and Techniques
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Content Standard(s) and Depth of Knowledge Level(s):	<p>Students will:</p> <p>4. Demonstrate proper usage of drafting instruments. Examples: architectural scales, graphite, lead holders</p> <ul style="list-style-type: none"> • Utilizing computer software for drafting applications • Reproducing drafting originals <p>Examples: print, plot, blueprint, photocopy</p>
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Learning Objective(s) and Depth of Knowledge Level(s):	<p>Students will:</p> <ol style="list-style-type: none"> 1. Select the appropriate scale for the given drawing problem according to ANSI standards. 2. Derive proper scaling and dimensions acceptable to industrial requirements on each assigned drawing. 3. Explain the different types of scales utilized in technical drafting and how they are used for measurements.
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Essential Question(s):	What is the significance of utilizing proper drafting instruments and techniques?
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Content Knowledge	Suggested Instructional Activities Rigor & Relevance Framework (Quadrant)	Suggested Materials, Equipment and Technology Resources
I. Drafting instruments II. Drawing media III. Drafting Kits IV. Plotter/Printer	Lecture Demonstration	Various types of: Scales Pencils Paper Plotter/Printer Templates

Unit Assessment:	Guided Practice, Written and Performance Test
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**Unit/Course
CTSO Activity:**

SkillsUSA State Leadership Conference and Competition

**Unit/Course
Culminating
Product:**

Portfolio

Course/Program Credential(s): Credential Certificate Postsecondary Degree University Degree
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Unit 5:	Lettering and Drawing Techniques
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Content Standard(s) and Depth of Knowledge Level(s):	<p>Students will:</p> <ol style="list-style-type: none"> Demonstrate drafting techniques for freehand sketching, lettering, geometric figures, and the alphabet of lines to create a drawing.
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Learning Objective(s) and Depth of Knowledge Level(s):	<p>Students will:</p> <ol style="list-style-type: none"> Apply sketching knowledge and techniques to solve the problem identified by the technical committee according to ANSI standards. Identify the types of sketches. Make freehand drawings to solve problems and convey ideas. Sketch a diagram to correct proportional sizes. Select the appropriate scale for the given drawing problem according to ANSI standards. Derive proper scaling and dimensions acceptable to industrial requirements on each assigned drawing. Explain the different types of scales utilized in technical drafting and how they are used for measurements.
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Essential Question(s):	Why is it imperative that the student understand and demonstrate proper lettering and drawing techniques?
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Content Knowledge	Suggested Instructional Activities Rigor & Relevance Framework (Quadrant)	Suggested Materials, Equipment and Technology Resources
<ol style="list-style-type: none"> Freehand lettering and/or software fonts Alphabet of lines and/or software line styles Geometric constructions Freehand sketching 	<p>Lecture Demonstration Instructional Technology</p>	<p>Workbook Textbook Paper Mechanical Pencil Eraser Various Scales Lettering Guide Graph paper Eraser shield</p>

Unit Assessment:	Guided Practice and Written Test
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**Unit/Course
CTSO Activity:**

SkillsUSA Alabama Leadership Conference and Competition, FFA Agricultural Mechanics CDE

**Unit/Course
Culminating
Product:**

Portfolio

Course/Program Credential(s): Credential Certificate Postsecondary Degree University Degree
 Other: Can lead to Articulation with Drafting Design Technology in Postsecondary

Course Title: Introduction to Drafting Design

Unit 6:	Multi-View Drawings
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Content Standard(s) and Depth of Knowledge Level(s):	<p>Students will:</p> <ol style="list-style-type: none"> Construct basic multi-view two-dimensional drawings, including visualizing principle views, creating third-angle projection, selecting proper drawing scale, and organizing layout of primary views.
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Learning Objective(s) and Depth of Knowledge Level(s):	<p>Students will:</p> <ol style="list-style-type: none"> Apply knowledge of orthographic projections to solve technical drafting problems according to ANSI standards. Explain the Theory of Orthographic Projection and how it relates to technical drafting. Draw two-dimensional orthographic projections from given three-dimensional views. Apply the principles of orthographic projection using CAD.
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Essential Question(s):	How do multi-view drawings contribute to the interpretation of the drawing?
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Content Knowledge	Suggested Instructional Activities Rigor & Relevance Framework (Quadrant)	Suggested Materials, Equipment and Technology Resources
<ol style="list-style-type: none"> I. Proper Views II. Drawing Scales III. Proper Layout IV. ANSI Standards 	<p>Lecture Demonstration Instructional Technology</p>	<p>LCD Projector Laptop AutoCAD Software Handouts Textbook Reference Books</p>

Unit Assessment:	Guided Practice, Written and Performance Test
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Unit/Course CTSO Activity:	SkillsUSA State Leadership Conference and Competition; FFA Agricultural Mechanics CDE
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Unit/Course Culminating Product:	Portfolio
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Course/Program Credential(s): <input type="checkbox"/> Credential <input type="checkbox"/> Certificate <input checked="" type="checkbox"/> Postsecondary Degree <input type="checkbox"/> University Degree <input type="checkbox"/> Other: Can lead to Articulation with Drafting Design Technology in Postsecondary
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Course Title: Introduction to Drafting Design

Unit 7:	Basic Dimensioning
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Content Standard(s) and Depth of Knowledge Level(s):	<p>Students will:</p> <ol style="list-style-type: none"> Apply dimensions and notes to multi-view drawings, utilizing American National Standards Institute (ANSI) dimensioning standards and decimal, metric, or dual dimensioning.
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Learning Objective(s) and Depth of Knowledge Level(s):	<p>Students will:</p> <ol style="list-style-type: none"> Implement techniques in dimensioning and tolerance including geometric dimensioning and tolerances to solve technical drafting problems according to ANSI standards. Define basic tolerance terminology. Demonstrate correct dimensioning techniques and symbol applications. Explain the theory of dimensioning. Identify dimensioning styles and methods.
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Essential Question(s):	Why is it so important for the student to understand and apply proper dimensioning techniques?
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Content Knowledge	Suggested Instructional Activities Rigor & Relevance Framework (Quadrant)	Suggested Materials, Equipment and Technology Resources
I. Dimensioning standards II. Decimal dimensioning III. Metric dimensioning IV. ANSI Standards	Lecture Demonstration Instructional Technology	Textbook Computer Software LCD Projector

Unit Assessment:	Guided Practice, Integrated Performances, Written and Performance Test
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Unit/Course CTSO Activity:	Begin preparation for SkillsUSA Alabama State Leadership Conference and Competition <ul style="list-style-type: none"> Job Skills Demo A – Begin preparation for all students – Graded Assignment Begin review of previous contest projects and Technical standards
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**Unit/Course
Culminating
Product:**

Portfolio

Course/Program Credential(s): Credential Certificate Postsecondary Degree University Degree
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Unit 8:	Fundamentals of Computer-Aided Drafting
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Content Standard(s) and Depth of Knowledge Level(s):	<p>Students will:</p> <p>8. Utilize CAD software to generate a multi-view drawing using appropriate file management techniques, basic drawing commands, and basic dimensioning techniques.</p> <p style="padding-left: 40px;">Examples: file management techniques – create, set up, and save files basic drawing commands – line, ellipse, circle, scale basic dimensioning techniques – linear, angular</p> <ul style="list-style-type: none"> • Utilizing CAD software and computer to print a multi-view drawing
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Learning Objective(s) and Depth of Knowledge Level(s):	<p>Students will:</p> <p>1. The student will utilize CAD software to create a computer generated 3-D model and drawing.</p>
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Essential Question(s):	How has Computer-Aided Drafting enhanced the Manufacturing and Construction fields?
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Content Knowledge	Suggested Instructional Activities Rigor & Relevance Framework (Quadrant)	Suggested Materials, Equipment and Technology Resources
<p>I. Fundamental computer skills</p> <p>II. Basic components of CADD</p> <p style="padding-left: 20px;">A. Set up commands</p> <p style="padding-left: 20px;">B. Drawing commands</p> <p style="padding-left: 20px;">C. Modifying commands</p> <p style="padding-left: 20px;">D. Dimensioning commands</p> <p style="padding-left: 20px;">E. 3D Solid Modeling Commands</p> <p style="padding-left: 20px;">F. File commands</p>	<p>Demonstration</p> <p>Instructional Technology</p> <p>Problem-based learning</p>	<p>LCD Projector</p> <p>Laptop</p> <p>AutoCAD Software</p> <p>Handouts</p> <p>Textbook</p> <p>Reference Books</p>

Unit Assessment:	Guided Practice, Written and Performance Test
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Unit/Course CTSO Activity:	SkillsUSA State Leadership Conference and Competition
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Unit/Course Culminating Product:	Portfolio
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Course/Program Credential(s): <input type="checkbox"/> Credential <input type="checkbox"/> Certificate <input checked="" type="checkbox"/> Postsecondary Degree <input type="checkbox"/> University Degree <input type="checkbox"/> Other: Can lead to Articulation with Drafting Design Technology in Postsecondary
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