

COURSE GUIDE

Department: **VOCATIONAL / INDUSTRIAL EDUCATION**
Course Title: **CAD DRAFTING & BLUEPRINT READING**
Date: **One Full Year Course and Credit**

Grade Level: **8-12**

Prerequisite/Requirements:

Register through [Vilas On Line](#) requirements.

Algebra I should be completed (suggested but not required).

Course Description:

CAD Drafting & Blueprint Reading - is a computer aide design course that gives students the basic CAD, print reading and technical drawing skills necessary for developing working drawings used during future classes and life planning challenges. Pre-engineering students find this program useful for developing skills needed during future college or university training. Art Students find this course develops additional skills and more exact refinement in their technique.

Costs to Students:

Arranged through Vilas On Line

GENERAL COURSE OUTCOMES:

CONCISE PHILOSOPHY STATEMENT

Drafting and drawing are basic to all education. The earliest efforts of man were first planned or sketched. The latest up-to-date efforts of mankind are drafted in detail before the first step is taken to construct the item. Computer Drafting and blueprint reading skills are general education, which help youth get ahead in the world of work. One of the main concerns is that we develop employable skills.

GENERAL OBJECTIVES OF DRAFTING

Develop skills and knowledge in the drafting and print reading parts

Develop an insight into drafting and related occupations

Develop accuracy and craftsmanship in computer drafting.

Develop desirable work habits and the ability to work in an all electronic format..

Develop an understanding of all kinds of common graphic representations and the ability to express ideas by means of electronic drawings and sketches.

Develop individual initiative and responsibilities as a person.

Develop an ability to solve problems.

Stimulate the development of leadership qualities through service projects.

Develop occupational safety habits and understandings.

Develop social responsibilities enabling the student to take his or her place in life and be a worthy and useful citizen.

REQUIRED UNIT OF STUDY:

Themes within the course/Specific concepts being targeted

Acquiring Employable Computer Graphic Skills
Developing Blue Print Reading Skills
Accuracy and Craftsmanship
Career Awareness
Application of math skills
Application of reading skills
Application of research skills
Application of writing skills
Application of artistic skills

GENERAL STANDARDS: (Detailed Standards see vocation standards below.)

This is a list of State Standards addressed in this course. Some students, parents and school administrators want to see what state educational standards are addressed in this course of study.

I. Colorado Department of Education Standards

- Math Standard 4.1:** Finding and analyzing relationships among geometric figures using transformations such as reflections, translations, rotations, dilations) in coordinate systems.
- Science Standard 5:** Students know and understand interrelationships among science, technology, and human activity and how they can affect the world.
- Art Standard 1:** Students will recognize and use the visual arts as a form of expression and communication.
- Art Standard 3:** Students will experience and apply various visual arts media and tools to develop techniques and skills.
- Technology Standards 1:** Students demonstrate a sound understanding of the nature and operation of technology systems.
- Technology Standards 3:** Students are proficient in the use of technology. Students use technology tools to enhance learning, increase productivity, and promote creativity. Students use productivity tools to collaborate in constructing technology-enhanced models, prepare publications, and produce other creative works.
- Technology Standards 5:** Students use telecommunications to collaborate, publish, and interact with peers, experts, and other audiences. Students use a variety of media and formats to communicate information and ideas effectively to multiple audiences.

Technology Standards 7: Technology problem-solving and decision-making tools. Students use technology resources for solving problems and making informed decisions. Students employ

technology in the development of strategies for solving problems in the real world.

Unit Modifications/Enrichments:

Assistance to students having difficulty and/or special needs

Additional contact time from and teacher is available even on weekends.

Repeatable video presentations showing the skills to be acquired for most assignments.

Working at your own self pace within unit deadlines is permitted.

Additional experiences for students capable of advanced work

(cooperative learning, adaptive materials, re-teaching, second chance, etc.)

Service learning projects within our community such as:

Maps for committees to use

Tutoring or presenting to small groups

Floor plans for the local fire department pre-planning response

Floor plan proposals for building use in our schools

Charts, Logos, Signs and Graphs to support school or club projects

Learning aids for teachers throughout the schools in your area

Sports fields and other site maps for special events

New software research and development

Lesson construction to help future classes

Symbol library development

II. Colorado State Vocational Education Standards

DESIGN APPLICATION

Multimedia, Engineering, and Architectural

The learner demonstrates organizational skills for multimedia project management.

The learner actively participates on a multimedia design team.

The learner develops script and/or text for multi-media, audio visual production.

The learner defines process and produces storyboard including sketching for production of multi-media, audio-visual production.

The learner identifies sources of visuals, sound, and information for multimedia production applications.

The learner demonstrates digital art applications.

The learner demonstrates basic animation skills.

The learner uses appropriate symbols/libraries.

The learner creates a 3-D object.

The learner creates 3-D wireframe models from 2-D geometry.

The learner will utilize editing commands (e.g., trimming, extending scaling).

The learner controls coordinates and display scale.

The learner controls entity properties (e.g., color, line, type).

The learner uses viewing commands (e.g., dynamic rotation, zooming, panning) and display.

The learner plots drawings on media using correct layout and scale.

The learner uses layering techniques.

The learner uses grouping techniques.

The learner uses query commands to integrate database (e.g., entity characteristics, distance, area, status).

The learner uses associative dimensioning correctly.

The learner will identify and demonstrate technical knowledge and skills about the use and care of drafting instruments and equipment materials and supplies.

The learner uses proper drafting symbols and alphabet of lines in accordance with technical standards and practices.

The learner will apply proper lettering techniques.

23. The learner interprets information from drawings, prints, and sketches.

The learner produces and reproduces drawings using modern technical methods for drafting reproduction.

The learner will identify the principal views of an object.

The learner produces detailed assembly drawings.

The learner will design and plan structures.

The learner will produce pilot plans.

The learner produces elevations.

The learner produces sections and details.

The learner produces electrical and plumbing plans.

The learner produces an elevation illustration of a structure.

The learner produces three-view orthographic isometric and oblique drawings.

The learner produces an auxiliary view and sectional.

The learner constructs geometric figures.

The learner produces detailed machine drawings.

The learner produces dimensional floor plan drawings.

The learner creates text using appropriate style and size to annotate drawings.

The learner will use and control accuracy enhancement tools (e.g., entity positioning methods such as snap and XYZ).

MATERIALS/RESOURCES:

All course ware is provided by Vilas On Line through the website at www.VilasOnLine.org

Media materials used

Instructor made videos stored on the student computer station or on the network at:

<http://www.VilasOnLine.org>

Technology needs

Vilas on line provides all technology needs.

Students having difficulty should contact:

vilas@vilasonline.org , or call us at (866) 539-4941.

ASSESSMENT PROGRAM:

Tests and Quizzes, Homework

Decimal Skills Test

Cad Basic Speed Tests

Symbol Identification Tests: Mechanical, Threads, Fasteners, Dimensioning, Electrical, Plumbing, Materials, Electronic, Geometric Tolerancing. Sketching Home work assignments, Grade Reports,

Writings: Notebook and written assignments may also be used if the instructor determines they are needed.

Concise list of units

This school year course is set for 180 class periods of 50 minutes each day.

Some student may finish early by their diligent and consistent work, high test scores and by developing quality design projects.

I. BASIC COMPUTER SKILLS

- A. WinXP Pro Operating System
- B. CAD Terms and icon use
- C. Software Overview
- D. Menu System
- E. Lesson Procedures
- F. Required Descriptive Writing

II. Office Software

- A. Document Preparation for CAD work
- B. Spread Sheet Preparation for CAD work
- C. Presentation Software for CAD work

III. Cad Commands

- A. Draw Menu
- B. Edit Menu
- C. File Handling
- D. Basic Data Entry Methods
- D. Introduction To Macros

IV. CAD Drawing Orthographic

- A. Software Drawing Tools
- B. Dimensioning Tools
- C. View Projection
- D. Line analysis
- E. Attributes
- F. Curve plotting

V. Section views

- A. Simple sections
- B. Half sections
- C. Offset sections
- D. Broken out
- E. Conventions
- G. Full sections
- H. Assembly sections

- I. Split sections
- K. Revolved sections
- L. Removed sections

VI. Blueprint reading lessons

- A. Cost Estimates
- B. Construction Specs Documents
- C. Working drawings in CAD and sketching format

VII. Threads and Fasteners

- A. Schematic
- B. Simplified
- C. Detailed
- D. Nut and Bolt assembly
- E. Single View Working drawings in CAD

VIII. Working Drawings

- A. 3 views skill development
- B. Skill tests

IX. Welding Symbols

- A. Applications
- B. Oral test

X. Architectural Symbols

- A. Measurement review
- B. Door symbols
- C. Window symbols
- D. Dimensions
- E. Plan symbols
- F. Plumbing symbols
- G. Electrical symbols
- H. Cross section symbols
- I. Concrete symbols
- J. Symbol test

XI. Architectural Layout and Design

- A. Kitchen layout
- B. Kitchen design
- C. Kitchen details
- D. Living room layout
- E. Living room design
- F. Bathroom layout
- G. Bedroom layout

- H. Garage and shop layout
- I. Elevation layout

XII. Topographical / Mapping Drawing

- A. Reading Plat Maps
- B. Plotting contour lines
- E. Cross sections graph
- F. Metes & Bounds Plats
- G. Test layout in CAD