

Glendale College

Course Outline of Record Report

Course ID 010487
Archived - September 2025

STV151 : Engineering Drafting and Basic Design Mirrored Course

General Information

Author:	<ul style="list-style-type: none"> Kimberli Perner
Course Code (CB01) :	STV151
Course Title (CB02) :	Engineering Drafting and Basic Design Mirrored Course
Department:	STV
Proposal Start:	Fall 2022 (Fall 2026)
TOP Code (CB03) :	(0953.00) Drafting Technology
CIP Code:	(15.1301) Drafting and Design Technology/Technician, General.
SAM Code (CB09) :	C - Clearly Occupational
Distance Education Approved:	No
Will this course be taught asynchronously?:	No
Course Control Number (CB00) :	CCC000613462
Curriculum Committee Approval Date:	09/24/2025
Board of Trustees Approval Date:	Pending
Last Cyclical Review Date:	11/01/2021
Course Description and Course Note:	<p>STV 151 Is a mirrored course for ENGR 101 that offers limited seating through noncredit. It covers the fundamentals of traditional board drafting, descriptive geometry, orthographic projection and the graphical communication of technical engineering information. Students learn to create complete and accurate drawings that concisely communicate an engineering design. Topics include freehand drawing, lettering, and theory of orthographic and multi-view projections. Basic drafting skills, industry standards and technical graphics practices, and engineering and architecture scales are presented. The glass box theory is used to visualize orthographic projection as well as the fundamentals of auxiliary views, coordinate systems, sectioning, dimensioning, intersection of planes, visibility, lines and order of precedence of line types. Coordination dimensioning and geometric dimensioning and tolerancing (GD&T) subjects are covered including location tolerance, datum reference, tolerance symbols and feature control frames. Lecture 27 hours and Laboratory 81 hours. Seating in this course is limited. Permission from the Short Term Vocational department is mandatory.</p>
Justification:	<p>New Course</p> <p>This course was archived in the catalog and PeopleSoft in Fall 2026. I could not change the proposal start.</p>
Academic Career:	<ul style="list-style-type: none"> Noncredit
Mode of Delivery:	No value
Author:	No value
Course Family:	No value

Academic Senate Discipline

Primary Discipline:	<ul style="list-style-type: none"> Vocational (short-term): Non-Credit
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Alternate Discipline: No value
 Alternate Discipline: No value

Course Development

Basic Skill Status (CB08)

Course is not a basic skills course.

Allow Students to Gain Credit by Exam/Challenge

Course Special Class Status (CB13)

Course is not a special class.

Pre-Collegiate Level (CB21)

Not applicable.

Grading Basis

- Pass / No-Pass Only

Course Support Course Status (CB26)

Course is not a support course

General Education and C-ID

General Education Status (CB25)

Not Applicable

Transferability

Not transferable

Transferability Status

Not transferable

Units and Hours

Summary

Minimum Credit Units (CB07) 0
Maximum Credit Units (CB06) 0
Total Course In-Class (Contact) Hours 108
Total Course Out-of-Class Hours 0
Total Student Learning Hours 108

Credit / Non-Credit Options

Course Type (CB04)

Non-Credit

Noncredit Course Category (CB22)

Workforce Preparation.

Noncredit Special Characteristics

No Value

Course Classification Code (CB11)

Workforce Preparation Enhanced Funding.

Variable Credit Course

Funding Agency Category (CB23)

Not Applicable.

Cooperative Work Experience Education

Status (CB10)

Weekly Student Hours

In Class

Out of Class

Course Student Hours

Course Duration (Weeks)

18

Lecture Hours	27	0	Hours per unit divisor	0
Laboratory Hours	81	0	Course In-Class (Contact) Hours	
Studio Hours	0	0	Lecture	27
			Laboratory	81
			Studio	0
			Total	108
			Course Out-of-Class Hours	
			Lecture	0
			Laboratory	0
			Studio	0
			Total	0

Time Commitment Notes for Students

No value

Units and Hours - Weekly Specialty Hours

Activity Name	Type	In Class	Out of Class
No Value	No Value	No Value	No Value

Prerequisites, Corequisites, Recommended Corequisites, and Recommended Preparation

Advisory

ENGL100 - *Writing Workshop

OR

Advisory

ESL141 - Grammar And Writing IV

Objectives

- Compose a 400 to 450-word thesis-based essay which: (a) summarizes and cites appropriately a reading passage provided as a prompt, (b) includes a clear thesis statement, (c) uses evidence to support the thesis, (d) shows clear organization into an introduction, body, and conclusion, and (e) uses appropriate rhetorical modes such as comparison/contrast, cause/effect, and persuasion in order to support a thesis.

Entry Standards	
Entry Standards	Description
demonstrate control of verb tenses in active and passive voice, gerunds and infinitives, conditionals real and unreal, adjective, noun, and adverb clauses, and transitional expressions;	ESL 141
comprehend multi-paragraph reading passages in textbooks.	ESL 141
Read, analyze, and evaluate contemporary articles and stories to identify topic, thesis, support, transitions, conclusion, audience, and tone;	ENGL 100
read, analyze, and evaluate contemporary articles and stories for the comprehension of difficult content and the identification of main ideas and (topic-based) evidence;	ENGL 100
read, analyze, and evaluate student compositions for unity, development, use of evidence, interpretation, coherence, and variety of sentence form;	ENGL 100
write a summary of a contemporary article or story with correct citation techniques;	ENGL 100
write an argumentative essay that has an introduction, body paragraphs, and a conclusion, demonstrating a basic understanding of essay organization;	ENGL 100
write an argumentative essay that addresses the topic, is directed by a thesis statement, uses appropriate textual evidence, develops logical interpretations, and concludes with some compelling observations;	ENGL 100
write an argumentative essay that integrates the ideas of others (i.e., authors) through	ENGL 100

paraphrasing, summarizing, and quoting with correct citation techniques;	
write an argumentative essay that generates novel ideas (those that add to the conversation rather than repeating the author's ideas) related to the topic and the readings;	ENGL 100
write compositions (e.g., summaries and argumentative essays) that are easy to read and follow, though some errors in grammar, mechanics, spelling, or diction may exist;	ENGL 100
proofread and edit essays for content, language, citation, and formatting problems.	ENGL 100

Course Limitations	
Cross Listed or Equivalent Course	Description
ENGR 101 Engineering Drafting and Basic Design	No Value

Specifications	
Methods of Instruction	
Methods of Instruction	Lecture
Methods of Instruction	Laboratory
Methods of Instruction	Multimedia
Methods of Instruction	Demonstrations
Methods of Instruction	Presentations

Out of Class Assignments

drawings (e.g. create an engineering drawing)
 essay (e.g. write a brief summary of an industry organization such as the American Society of Civil Engineers ASCE)

Methods of Evaluation

Exam/Quiz/Test
 Project/Portfolio
 Exam/Quiz/Test

Description of Activity/Interaction

Exams
 projects (e.g. create a set of engineering drawings of each part of a machinist's vise)
 final Exam

Textbook Rationale

No Value

Textbooks

Author	Title	Publisher	Date	ISBN
Mariano Alcañiz	Visualization and Engineering Design Graphics with Augmented	SDC Publications	2019	978-1-63057-269-3
E. Max Raisor	Engineering Graphics Principles with Geometric Dimensioning and Tolerancing	SDC Publications	2017	978-1630571214

Other Instructional Materials (i.e. OER, handouts)

No Value

Learning Outcomes

Course Objectives

Demonstrate rules of orthographic projection by creating detailed multi-view drawings;

analyze an object and create auxiliary and section views of its features when necessary;

explain the glass box theory and the geometric relationships of orthographic views.

SLOs

complete a series of basic drafting assignments utilizing lecture and text information Expected Outcome Performance: 70.0

STV Drafting and Basic Design Certificate	Apply basic knowledge of industrial drafting practices.
	Demonstrate knowledge of basic drafting and dimensioning through a series of drawing assignments.
STV Drafting and Basic Design Certificate of Completion	Apply basic knowledge of industrial drafting practices.
	Apply industry standards to calculation problems and choose appropriate solutions.
	Demonstrate knowledge of basic drafting and dimensioning through a series of drawing assignments.
ILOs Core ILOs	Demonstrate depth of knowledge in a course, discipline, or vocation by applying practical knowledge, skills, abilities, theories, or methodologies to solve unique problems.

demonstrate knowledge of basic drafting and dimensioning through a series of drawing assignments Expected Outcome Performance: 70.0

STV Drafting and Basic Design Certificate	Apply basic knowledge of industrial drafting practices.
	Apply industry standards to calculation problems and choose appropriate solutions.
	Demonstrate knowledge of basic drafting and dimensioning through a series of drawing assignments.
STV Drafting and Basic Design Certificate of Completion	Apply basic knowledge of industrial drafting practices.
	Apply industry standards to calculation problems and choose appropriate solutions.
	Demonstrate knowledge of basic drafting and dimensioning through a series of drawing assignments.
ILOs Core ILOs	Demonstrate depth of knowledge in a course, discipline, or vocation by applying practical knowledge, skills, abilities, theories, or methodologies to solve unique problems.

apply basic knowledge of industrial drafting practices through tests and lecture information Expected Outcome Performance: 70.0

STV Drafting and Basic Design Certificate	Apply basic knowledge of industrial drafting practices.
	Demonstrate knowledge of basic drafting and dimensioning through a series of drawing assignments.
STV Drafting and Basic Design Certificate of Completion	Apply basic knowledge of industrial drafting practices.
	Demonstrate knowledge of basic drafting and dimensioning through a series of drawing assignments.
ILOs Core ILOs	Demonstrate depth of knowledge in a course, discipline, or vocation by applying practical knowledge, skills, abilities, theories, or methodologies to solve unique problems.

Course Content

Lecture Content

Introduction to Graphic Representation of Physical Objects (2 hours)

- History of drafting and engineering graphics
- Drafting and design
- Civil engineering applications
- Mechanical engineering applications
- Engineering design
- Importance of fundamentals to modern computer aided design Industry standards ASME 14.5

- American Design Drafting Association (ADDA)
- American Society of Mechanical Engineers (ASME)
- American Society of Civil Engineers (ASCE)

Instruments and Drafting Tools (2 hours)

- Units of measurement
- Reading scales
- Drafting board, drafting machine, drawing head
- Compass and protractor
- Calipers and micrometers

Geometric Construction (2 hours)

- Geometry of straight line
- Geometry of curves
- Bisecting lines and curves
- Tangencies

Standard Lettering (1 hours)

- Upper case Gothic and other fonts
- Free hand lettering uses in industry today
- Mark ups, field notes and corrections

Theory of Orthographic Drawing (2 hours)

- Glass box theory or concept
- Six principal views and their relationships
- Projection plane and visual rays
- Assumption of infinite distance to a plane
- Normal view

Process and Practice of Orthographic Projection Drawing (2 hours)

- Selection of views
- Projection of views
- Orthographic freehand sketching
- Reading orthographic projection
- Projection of normal surfaces
- Projection of inclined surfaces
- Projection of skewed surfaces
- Projection of curved surfaces

Pictorial Drawing and Sketching (2 hours)

- Axonometric projection
- Isometric projection
- Dimetric projection
- Trimetric projection
- Oblique projection
- Perspective drawing

Auxiliary Views (2 hours)

- Descriptive geometry
- Fold lines
- True length
- True size and shape
- When to create an auxiliary view

Sectioning (1 hours)

- Types of sections
- Standard Full and half sections
- Revolved sections
- Cross hatching conventions and standards

Lines and Line Types (1 hours)

- Solid or edge lines
- Hidden or dashed lines
- Center lines and center marks
- Construction and projection lines
- Line quality and thickness

Civil Engineering Applications (2 hours)

- Elevations
- Topographical maps
- Surveying
- Definition of Geographic Information systems (GIS)
- Definition of Building Information Management (BIM)
- Title block

Mechanical and Manufacturing Engineering Applications (2 hours)

- Fasteners
- Basic hole and shaft systems
- Standard notation for fasteners
- Production drawings
- Drawing notes
- Title block

Engineering Design Process (2 hours)

- Engineering design process steps
- Iteration
- Drawing revision
- Roles of engineers, designers, technologists and technicians

Dimensioning (2 hours)

- Dimension standards
- Coordinate dimensioning
- Arrows and leaders
- Fully defined dimensions
- Clarity and order of dimensions

Geometric Dimensioning and Tolerancing (GD&T) (2 hours)

- Fundamental rules
- GD&T symbols
- Feature control frames Datums
- Material condition modifiers
- Maximum and least material conditions
- Importance of GD&T in manufacturing

Total hours 27

Laboratory/Studio Content

Introduction to Graphic Representation of Physical Objects (2 hours)

- History of drafting and engineering graphics
- Drafting and design
- Civil engineering applications
- Mechanical engineering applications
- Engineering design
- Importance of fundamentals to modern computer aided design Industry standards ASME 14.5
- American Design Drafting Association (ADDA)
- American Society of Mechanical Engineers (ASME)
- American Society of Civil Engineers (ASCE)

Instruments and Drafting Tools (5 hours)

- Units of measurement
- Reading scales
- Drafting board, drafting machine, drawing head
- Compass and protractor
- Calipers and micrometers

Geometric Construction (5 hours)

- Geometry of straight line
- Geometry of curves
- Bisecting lines and curves
- Tangencies

Standard Lettering (2 hours)

- Upper case Gothic and other fonts

- Free hand lettering uses in industry today
- Mark ups, field notes and corrections

Theory of Orthographic Drawing (7 hours)

- Glass box theory or concept
- Six principal views and their relationships
- Projection plane and visual rays
- Assumption of infinite distance to a plane
- Normal view

Process and Practice of Orthographic Projection Drawing (7 hours)

- Selection of views
- Projection of views
- Orthographic freehand sketching
- Reading orthographic projection
- Projection of normal surfaces
- Projection of inclined surfaces
- Projection of skewed surfaces
- Projection of curved surfaces

Pictorial Drawing and Sketching (7 hours)

- Axonometric projection
- Isometric projection
- Dimetric projection
- Trimetric projection
- Oblique projection
- Perspective drawing

Auxiliary Views (7 hours)

- Descriptive geometry
- Fold lines
- True length
- True size and shape
- When to create an auxiliary view

Sectioning (6 hours)

- Types of sections
- Standard Full and half sections
- Revolved sections
- Cross hatching conventions and standards

Lines and Line Types (2 hours)

- Solid or edge lines
- Hidden or dashed lines
- Center lines and center marks
- Construction and projection lines
- Line quality and thickness

Civil Engineering Applications (6 hours)

- Elevations
- Topographical maps
- Surveying
- Definition of Geographic Information systems (GIS)
- Definition of Building Information Management (BIM)
- Title block

Mechanical and Manufacturing Engineering Applications (6 hours)

- Fasteners
- Basic hole and shaft systems
- Standard notation for fasteners
- Production drawings
- Drawing notes

Title block Engineering Design Process (5 hours)

- Engineering design process steps
- Iteration
- Drawing revision
- Roles of engineers, designers, technologists and technicians

Dimensioning (7 hours)

- Dimension standards
- Coordinate dimensioning
- Arrows and leaders
- Fully defined dimensions
- Clarity and order of dimensions

Geometric Dimensioning and Tolerancing (GD&T) (7 hours)

- Fundamental rules
- GD&T symbols
- Feature control frames Datums
- Material condition modifiers
- Maximum and least material conditions
- Importance of GD&T in manufacturing

Total hours 81