



Course Syllabus

DFTG 1325 - Blueprint Reading and Sketching

Catalog Description: An introduction to reading and interpreting working drawings for fabrication processes and associated trades. Use of sketching techniques to create pictorial and multiple-view drawings.

Lecture hours = 2, Lab hours = 3

Prerequisites: None

Semester Credit Hours: 3

Lecture Hours per Week: 2

Lab Hours per Week: 3

Extended hours:

Contact Hours per Semester: 80

State Approval Code: 15.1301

Class section meeting time:

Instructional Goals and Purposes: The purpose of this course is to interpret working drawings including dimensions, notes, symbols, sections, and auxiliary views; and sketch pictorials and multi-view drawings. In addition, to provide an understanding of the various types of drawings used in multiple disciplines, such as, petroleum technology, electrical and instrumentation, construction and etc.; and knowledge of drawing-document change control; and a basic understanding of the relationship between drawings and technical procedures which reference and illustrate-support the drawings.

...Learning Outcomes:

1. Prints: The Language of Industry
2. Line conventions and lettering
3. Title blocks and parts lists
4. Geometric terms and construction
5. Multiview drawings
6. Section views
7. Auxiliary views
8. Screw thread representation
9. Dimensioning
10. Tolerancing
11. Welding prints

12. Instrumentation and control drawings
13. Basic technical sketching and lettering

Specific Course Objectives (includes SCANS):

After studying all materials and resources presented in the course, the student will be able to:

1. **Prints: The Language of Industry.** (1 A-I, 1A-ii, 1A-iv, 1B-iii, 1B-iv, 1C-I, 1C-iv, 2A-I, 2A-iii, 2B-I, 2C-i, 2C-ii, 2C-iii, 2D-ii, 2D-iii, 2E-ii)
 - a. Identify the importance of prints.
 - b. Discuss historical processes and current role of prints in the design process.
 - c. Explain the historical and current role of prints in the design process.
 - d. Identify and define terms related to prints.
 - e. Explain how prints are produced.
 - f. Identify two important elements of print reading.
 - g. Identify ways in which to care for prints.
 - h. Identify and discuss options for using prints in an electronic (digital) format.
 - i. Discuss the role of various organizations in the standardization of drawings.
 - j. Discuss trends in engineering documentation that may reduce the need for paper prints.
2. **Line conventions and lettering.** (1 A-I, 1A-ii, 1A-iv, 1B-iii, 1B-iv, 1C-I, 1C-iv, 2A-I, 2A-iii, 2B-I, 2C-i, 2C-ii, 2C-iii, 2D-ii, 2D-iii, 2E-ii)
 - a. Identify the standard alphabet of lines.
 - b. Describe the types of lines by appearance and purpose.
 - c. Identify the style of lettering recommended for standard industrial drawings.
3. **Title blocks and parts lists.** (1 A-I, 1A-ii, 1A-iv, 1B-iii, 1B-iv, 1C-I, 1C-iv, 2A-I, 2A-iii, 2B-I, 2C-i, 2C-ii, 2C-iii, 2D-ii, 2D-iii, 2E-ii)
 - a. Describe drawing sheet sizes and formats.
 - b. Identify marginal information and zoning methods for drawing sheets.
 - c. Identify the elements of the title block as defined by industry standards.
 - d. Explain the techniques for identifying parts of an assembly drawing as represented in a basic parts list.
4. **Geometric terms and construction.** (1 A-I, 1A-ii, 1A-iv, 1B-iii, 1B-iv, 1C-I, 1C-iv, 2A-I, 2A-iii, 2B-I, 2C-i, 2C-ii, 2C-iii, 2D-ii, 2D-iii, 2E-ii)
 - a. Define terms related to the geometry of industrial drawings.
 - b. Describe orientation relationships found within two-dimensional and three-dimensional geometry.
 - c. List various properties of geometric constructions.
 - d. Identify two-dimensional geometric shapes.
 - e. Identify three-dimensional geometric shapes.
 - f. Identify specialized geometric elements that are used in product design.
5. **Multiview drawings.** (1 A-I, 1A-ii, 1A-iv, 1B-iii, 1B-iv, 1C-I, 1C-iv, 2A-I, 2A-iii, 2B-I, 2C-i, 2C-ii, 2C-iii, 2D-ii, 2D-iii, 2E-ii)
 - a. Define spatial visualization.
 - b. Explain the relationship between an orthographic projection and a multiview drawing.
 - c. Identify and define the three dimensions of an object.
 - d. Define the six principal views and the three regular views.
 - e. Identify the three principal projection planes.
 - f. Explain three visualization principles for multiview drawings.
 - g. Identify the three types of flat surfaces.
 - h. Explain characteristics of cylindrical surfaces.
 - i. Explain characteristics of fillets, rounds, and runouts.
 - j. Identify differences between third-angle and first-angle projection.
 - k. Discuss computer-generated views.
6. **Section views.** (1 A-I, 1A-ii, 1A-iv, 1B-iii, 1B-iv, 1C-I, 1C-iv, 2A-I, 2A-iii, 2B-I, 2C-i, 2C-ii, 2C-iii, 2D-ii, 2D-iii, 2E-ii)

- a. Explain the characteristics of a drawing that features a full section view.
 - b. Describe the characteristics of a half section view.
 - c. Describe the characteristics of an offset section view.
 - d. Identify the characteristics of a sectional view that features aligned features.
 - e. Identify the characteristics of a view that features a broken-out section.
 - f. Compare revolved sections and removed sections and identify the characteristics of these sections.
 - g. Explain conventional practices applied to section views.
 - h. Identify the proper representation of partial sections and outline sections.
 - i. Identify the proper representation of separate parts in an assembly section view.
 - j. Discuss computer-generated section views.
7. **Auxiliary views.** (1 A-I, 1A-ii, 1A-iv, 1B-iii, 1B-iv, 1C-I, 1C-iv, 2A-I, 2A-iii, 2B-I, 2C-i, 2C-ii, 2C-iii, 2D-ii, 2D-iii, 2E-ii)
- a. Explain the purposes of auxiliary views.
 - b. Identify auxiliary views and explain their relationship to principal views.
 - c. Discuss terms related to auxiliary view projection.
 - d. Read prints that incorporate auxiliary views.
 - e. Discuss computer-generated auxiliary views.
8. **Screw thread representation.** (1 A-I, 1A-ii, 1A-iv, 1B-iii, 1B-iv, 1C-I, 1C-iv, 2A-I, 2A-iii, 2B-I, 2C-i, 2C-ii, 2C-iii, 2D-ii, 2D-iii, 2E-ii)
- a. Define terms related to screw threads and fasteners.
 - b. Identify common screw thread forms.
 - c. Describe three methods for representing screw threads.
 - d. Discuss screw thread characteristics that may affect the specification.
 - e. Explain the different parts of a screw thread specification or callout.
 - f. Discuss the differences between metric threads and inch threads.
 - g. Identify standard pipe thread representation and designations.
 - h. Describe computer-generated thread representations.
9. **Dimensioning.** (1 A-I, 1A-ii, 1A-iv, 1B-iii, 1B-iv, 1C-I, 1C-iv, 2A-I, 2A-iii, 2B-I, 2C-i, 2C-ii, 2C-iii, 2D-ii, 2D-iii, 2E-ii)
- a. Identify terms and measurements associated with dimensioning mechanics.
 - b. Identify symbols that have been standardized for dimensioning notations.
 - c. Explain the choice and placement rules drafters use when creating dimensions.
 - d. Identify and discuss various systems and methods for dimensioning.
 - e. Describe additional types of dimensions used in special ways.
 - f. Discuss alternative methods for describing size and applying dimensions.
10. **Tolerancing.** (1 A-I, 1A-ii, 1A-iv, 1B-iii, 1B-iv, 1C-I, 1C-iv, 2A-I, 2A-iii, 2B-I, 2C-i, 2C-ii, 2C-iii, 2D-ii, 2D-iii, 2E-ii)
- a. Define terms related to tolerancing.
 - b. Explain how tolerances are expressed on a drawing.
 - c. Identify tolerance values for dimensions on the drawing, regardless of the tolerancing expression.
 - d. Compare customary inch tolerance classes with metric tolerance classes.
 - e. Calculate tolerances or limits for mating parts based on maximum material conditions and allowance.
11. **Welding prints.** (1 A-I, 1A-ii, 1A-iv, 1B-iii, 1B-iv, 1C-I, 1C-iv, 2A-I, 2A-iii, 2B-I, 2C-i, 2C-ii, 2C-iii, 2D-ii, 2D-iii, 2E-ii)
- a. Identify a welding symbol.
 - b. List the elements of a welding symbol.
 - c. Explain the meaning of a welding symbol.
 - d. Identify the basic *weld* symbols used in *welding* symbols.
 - e. Discuss other welding applications.

12. **Instrumentation and control drawings.** (1 A-I, 1A-ii, 1A-iv, 1B-iii, 1B-iv, 1C-I, 1C-iv, 2A-I, 2A-iii, 2B-I, 2C-i, 2C-ii, 2C-iii, 2D-ii, 2D-iii, 2E-ii)
 - a. Describe the types of control diagrams.
 - b. Identify symbols used on fluid power diagrams.
 - c. Recognize supplementary information accompanying circuit diagrams.
 - d. Read a graphic diagram.
 - e. Interpret graphic diagrams for fluid control devices.
13. **Basic technical sketching and lettering.** (1 A-I, 1A-ii, 1A-iv, 1B-iii, 1B-iv, 1C-I, 1C-iv, 2A-I, 2A-iii, 2B-I, 2C-i, 2C-ii, 2C-iii, 2D-ii, 2D-iii, 2E-ii)
 - a. Identify the materials to create a technical sketch.
 - b. Discuss the proper methods for sharpening a pencil.
 - c. Discuss the proper methods for holding a pencil for sketching.
 - d. Sketch horizontal, vertical, and inclined lines.
 - e. Sketch arcs, circles, and ellipses.
 - f. Identify aids used for freehand technical sketching.
 - g. Read and sketch Gothic-style technical lettering.
 - h. Identify and use guidelines for lettering.
 - i. Discuss the proper spacing methods for lettering.

Course Content:

A general description of lecture/discussion topics included in this course are listed in the Learning Objectives / Specific Course Objectives sections of this syllabus.

Students in all sections of this course will be required to do the following:

1. Study the assigned materials and complete review questions, unit quizzes and exams to assess understanding and comprehension of the material presented.
2. ***Students will submit all assignments in a timely manner. Homework quizzes (unit review questions) are due each Thursday before 11:59 PM. Unit quizzes are due each Saturday before 11:59 PM. Late submissions will not be accepted and no makeup work will be allowed in this course.***

Methods of Instruction/Course Format/Delivery:

This course is presented online only. Students will have access to this course through Canvas. The course is composed of 13 modules, each containing one complete unit of study. Each unit of study consist of a reading assignment and powerpoint, unit review questions presented in quiz format, and unit quiz. ***The course is designed to allow students to work ahead if desired.***

Major Assignments / Assessments:

The following items will be assigned and assessed during the semester and used to calculate the student's final grade.

Assignments

1. Unit 1 Prints: The Language of Industry
2. Unit 2 Line Conventions and Lettering
3. Unit 3 Title Blocks and Parts Lists
4. Unit 4 Geometric Terms and Construction
5. Unit 5 Multiview Drawings
6. Unit 6 Section Views
7. Unit 7 Auxiliary Views
8. Unit 8 Screw Thread Representation

9. Unit 9 Dimensioning
10. Unit 10 Tolerancing
11. Unit 22 Welding Prints
12. Unit 23 Instrumentation and Control Drawings
13. Unit C Basic Technical Sketching and Lettering

Assessment(s):

1. Unit 1 Homework Quiz
2. Unit 1 Quiz
3. Unit 2 Homework Quiz
4. Unit 2 Quiz
5. Unit 3 Homework Quiz
6. Unit 3 Quiz
7. Unit 4 Homework Quiz
8. Unit 4 Quiz
9. Unit 5 Homework Quiz
10. Unit 5 Quiz
11. Unit 6 Homework Quiz
12. Unit 6 Quiz
13. Unit 7 Homework Quiz
14. Unit 7 Quiz
15. Unit 8 Homework Quiz
16. Unit 8 Quiz
17. Unit 9 Homework Quiz
18. Unit 9 Quiz
19. Unit 10 Homework Quiz
20. Unit 10 Quiz
21. Unit 22 Homework Quiz
22. Unit 22 Quiz
23. Unit 23 Homework Quiz
24. Unit 23 Quiz
25. Unit C Quiz
26. Midterm Exam (Must be administered by a Testing Center in Carthage, Center, or Marshall)
27. Final Exam (Must be administered by a Testing Center in Carthage, Center, or Marshall)

Grading Scale: A=90-100, B=80-89, C=70-79, D=60-69, F=59 and below

Course Grade:

The grading scale for this course is as follows:

- Homework Quizzes – 30%
- Unit Quizzes – 30%
- Midterm and Final Exam – 40%

Texts, Materials, and Supplies:

- *Print Reading for Industry, 10th Edition, Walter C. Brown / Ryan K. Brown, ISBN 9781631260513* (Includes Large Prints Packet)

Required Readings:

- N/A

Recommended Readings:

- N/A

Other: N/A

- For current texts and materials, use the following link to access bookstore listings:
<http://www.panolacollegestore.com>
- For testing services, use the following link: <http://www.panola.edu/elearning/testing.html>
- If any student in this class has special classroom or testing needs because of a physical learning or emotional condition, please contact the ADA Student Coordinator in Support Services located in the Administration Building or go to <http://www.panola.edu/student-success/disability-support-services/> for more information.
- Withdrawing from a course is the student's responsibility. Students who do not attend class and who do not withdraw will receive the grade earned for the course.
- Student Handbook, *The Pathfinder*:
<http://www.panola.edu/student-success/documents/pathfinder.pdf>

SCANS CRITERIA

- 1) **Foundation skills are defined in three areas: basic skills, thinking skills, and personal qualities.**
 - a) **Basic Skills:** A worker must read, write, perform arithmetic and mathematical operations, listen, and speak effectively. These skills include:
 - i) Reading: locate, understand, and interpret written information in prose and in documents such as manuals, graphs, and schedules.
 - ii) Writing: communicate thoughts, ideas, information, and messages in writing, and create documents such as letters, directions, manuals, reports, graphs, and flow charts.
 - iii) Arithmetic and Mathematical Operations: perform basic computations and approach practical problems by choosing appropriately from a variety of mathematical techniques.
 - iv) Listening: receive, attend to, interpret, and respond to verbal messages and other cues.
 - v) Speaking: Organize ideas and communicate orally.
 - b) **Thinking Skills:** A worker must think creatively, make decisions, solve problems, visualize, know how to learn, and reason effectively. These skills include:
 - i) Creative Thinking: generate new ideas.
 - ii) Decision Making: specify goals and constraints, generate alternatives, consider risks, and evaluate and choose the best alternative.
 - iii) Problem Solving: recognize problems and devise and implement plan of action.
 - iv) Visualize ("Seeing Things in the Mind's Eye"): organize and process symbols, pictures, graphs, objects, and other information.
 - v) Knowing How to Learn: use efficient learning techniques to acquire and apply new knowledge and skills.
 - vi) Reasoning: discover a rule or principle underlying the relationship between two or more objects and apply it when solving a problem.
 - c) **Personal Qualities:** A worker must display responsibility, self-esteem, sociability, self-management, integrity, and honesty.
 - i) Responsibility: exert a high level of effort and persevere toward goal attainment.
 - ii) Self-Esteem: believe in one's own self-worth and maintain a positive view of oneself.
 - iii) Sociability: demonstrate understanding, friendliness, adaptability, empathy, and politeness in group settings.
 - iv) Self-Management: assess oneself accurately, set personal goals, monitor progress, and exhibit self-control.
 - v) Integrity and Honesty: choose ethical courses of action.
- 2) **Workplace competencies are defined in five areas: resources, interpersonal skills, information, systems, and technology.**
 - a) **Resources:** A worker must identify, organize, plan, and allocate resources effectively.
 - i) Time: select goal-relevant activities, rank them, allocate time, and prepare and follow schedules.
 - ii) Money: Use or prepare budgets, make forecasts, keep records, and make adjustments to meet objectives.
 - iii) Material and Facilities: Acquire, store, allocate, and use materials or space efficiently.
Examples: construct a decision time line chart; use computer software to plan a project; prepare a budget; conduct a cost/benefits analysis; design an RFP process; write a job description; develop a staffing plan.
 - b) **Interpersonal Skills:** A worker must work with others effectively.

- i) Participate as a Member of a Team: contribute to group effort.
 - ii) Teach Others New Skills.
 - iii) Serve Clients/Customers: work to satisfy customer's expectations.
 - iv) Exercise Leadership: communicate ideas to justify position, persuade and convince others, responsibly challenge existing procedures and policies.
 - v) Negotiate: work toward agreements involving exchange of resources, resolve divergent interests.
 - vi) Work with Diversity: work well with men and women from diverse backgrounds.
- Examples: collaborate with a group member to solve a problem; work through a group conflict situation, train a colleague; deal with a dissatisfied customer in person; select and use appropriate leadership styles; use effective delegation techniques; conduct an individual or team negotiation; demonstrate an understanding of how people from different cultural backgrounds might behave in various situations.

c) **Information:** A worker must be able to acquire and use information.

- i) Acquire and Evaluate Information.
- ii) Organize and Maintain Information.
- iii) Interpret and Communicate Information.
- iv) Use Computers to Process Information.

Examples: research and collect data from various sources; develop a form to collect data; develop an inventory record-keeping system; produce a report using graphics; make an oral presentation using various media; use on-line computer data bases to research a report; use a computer spreadsheet to develop a budget.

d) **Systems:** A worker must understand complex interrelationships.

- i) Understand Systems: know how social, organizational, and technological systems work and operate effectively with them.
- ii) Monitor and Correct Performance: distinguish trends, predict impacts on system operations, diagnose deviations in systems' performance and correct malfunctions.
- iii) Improve or Design Systems: suggest modifications to existing systems and develop new or alternative systems to improve performance.

Examples: draw and interpret an organizational chart; develop a monitoring process; choose a situation needing improvement, break it down, examine it, propose an improvement, and implement it.

e) **Technology:** A worker must be able to work with a variety of technologies.

- i) Select Technology: choose procedures, tools or equipment including computers and related technologies.
- ii) Apply Technologies to Task: understand overall intent and proper procedures for setup and operation of equipment.
- iii) Maintain and Troubleshoot Equipment: Prevent, identify, or solve problems with equipment, including computers and other technologies.

Examples: read equipment descriptions and technical specifications to select equipment to meet needs; set up and assemble appropriate equipment from instructions; read and follow directions for troubleshooting and repairing equipment.