

MET-123A: ENGINEERING DRAWING

Cuyahoga Community College

Viewing: MET-123A : Engineering Drawing

Board of Trustees:

February 2019

Academic Term:

Fall 2019

Subject Code

MET - Mech Eng/Manuf Ind Eng Tech

Course Number:

123A

Title:

Engineering Drawing

Catalog Description:

Apply visualization skills in the interpretation of orthographic projections and pictorial drawings. Applied geometry, use of scales, sections, and auxiliary views are studied. Dimensioning standards and conventions as applied to detail and assembly drawings in manual drafting.

Credit Hour(s):

1

Lab Hour(s):

3

Requisites

Prerequisite and Corequisite

MATH-0955 Beginning Algebra or appropriate Math placement score to place into MATH-0965 Intermediate Algebra.

Outcomes

Course Outcome(s):

Draw and interpret various types of engineering drawings in accordance with standard dimensioning practices and conventions.

Essential Learning Outcome Mapping:

Critical/Creative Thinking: Analyze, evaluate, and synthesize information in order to consider problems/ideas and transform them in innovative or imaginative ways.

Oral Communication: Demonstrate effective verbal and nonverbal communication for an intended audience that is clear, organized, and delivered effectively following the standard conventions of that language.

Objective(s):

1. Utilize standard dimensioning practices and conventions.
2. Demonstrate the use of engineering drawing instruments, including sketching, scales, and basic tools such as compass, straight edges, and triangles.
3. Demonstrate the proper use of points, lines and planes in technical drawings.
4. Discuss the use and importance of notes on a drawing.
5. Interpret geometrical figures, symbols, and construction as used in technical drawings.
6. Draw and interpret multi-view orthographic sketches and drawings.
7. Draw and interpret axonometric sketches and drawings.
8. Draw and interpret section views on a drawing.
9. Draw and interpret auxiliary views on drawings.
10. Draw and interpret oblique sketches and drawings.

Course Outcome(s):

Relate engineering drawings to manufacturing practices and processes and communicate in an appropriate manner with various audiences.

Essential Learning Outcome Mapping:

Critical/Creative Thinking: Analyze, evaluate, and synthesize information in order to consider problems/ideas and transform them in innovative or imaginative ways.

Written Communication: Demonstrate effective written communication for an intended audience that follows genre/disciplinary conventions that reflect clarity, organization, and editing skills.

Objective(s):

1. Discuss production and manufacturing processes and their relationship to technical graphics.
 2. Describe the engineering design process.
 3. Explain the language of the engineering field
 4. Relate the proper communication method to the proper audience.
 5. Demonstrate improved mental visualization skills.
 6. Work with others in class to foster interpersonal skills.
 7. Draw and interpret detail and assembly drawings.
-

Methods of Evaluation:

1. Quizzes and/or midterm examination
2. Final examination
3. Drawing assignments, Worksheets
4. Written Assignment
5. Oral Presentation

Course Content Outline:

1. Introduction
 - a. Objectives, content and organization of the course
 - b. Identification of equipment required of students
 - c. Selection criteria to aid in the selection of equipment
2. Lettering
 - a. Techniques
 - b. Types
3. Use and application of instruments and scales:
 - a. Architect's and civil engineer's
 - b. Mechanical engineer's
 - c. Metric
4. Characteristics and uses of lines in a drawing
 - a. ABC's of lines
 - b. Line weights
 - c. Precedence of lines
 - d. Sketching techniques
5. Applied geometry
 - a. Parallel and perpendicular lines
 - b. Regular polygons
 - c. Dividing into equal parts
 - d. Tangents, locating centers
 - e. Bisecting lines and angles
6. Multi-view orthographic drawing and sketching
 - a. Definition of orthographic projection
 - b. Standard views and their interpretation
 - c. Points, lines, surfaces
 - d. Fillets and rounds, run outs
7. Pictorial drawing and sketching
 - a. Principles and applications of axonometric and oblique drawings
 - b. Practice in isometric and oblique drawing with sketching
8. Sectional views
 - a. Full
 - b. Half
 - c. Revolved
 - d. Removed

- e. Offset
- f. Aligned sections
- g. Exceptions to section rules
- h. Conventional breaks
- 9. Auxiliary views
 - a. Normal views of inclined and oblique surfaces
 - b. Projection methods
- 10. Dimensioning
 - a. Drawing to scale
 - b. Selection and placement of dimensions
 - c. Dimensioning standard features
 - d. Aligned and unidirectional dimensioning
 - e. Baseline and chain dimensioning
 - f. Drawing symbols
- 11. Design process
 - a. General
 - b. Local
 - c. Leaders
 - d. Symbols
- 12. Types and sets of drawings and their purposes
 - a. Detail and assembly drawings
 - b. Normal inclusions and omissions

Resources

Bethune, James. *Engineering Graphics with AutoCAD 2017*. Upper Saddle River, NJ, 2017.

Dix, Mark and Paul Riley. *Discovering AutoCAD 2017*. Upper Saddle River, NJ, 2017.

Giesecke, Frederick E. et al. *Technical Drawing with Engineering Graphics*. 15th ed. Upper Saddle River, NJ. Prentice Hall, 2016.

Hart, Hillary. *Introduction to Engineering Communication*. 2nd ED. Upper Saddle River, NJ. Prentice Hall, 2009.

Koser, Gary and Dean Zirwas. *Workplace skills for success with AutoCAD 2011 basics: a layered learning approach..* Upper Saddle River, NJ, 2011.

Lehmann, K. F. *Journal of Mechanical Design*. 10-01-2007. New York: American Society of Mechanical Engineers, 2007.

Paul, Richard and Frank Puerta and Jim Fitzgerald. *Autocad 2010 in 2D and 3D: A Modern Approach*. Upper Saddle River, NJ, 2010.

"Questex" "www.Cadalist.com.". 2007-10-01 00:00:00.0.

Fuller, Ashleigh and Antonio Ramirez. *Technical Drawing 101 with AutoCAD*. 2nd ed. Prentice Hall: Upper Saddle River, NJ, 2017.

Resources Other

- Assignment and Project handouts
- AutoCad software

Top of page

Key: 4544