

ITT Technical Institute

DT1115

Introduction to Drafting and Design

Onsite and Online Course

SYLLABUS

Credit hours: 6


Contact/Instructional hours: 70 (50 Theory Hours, 20 Lab Hours)

Prerequisite(s) and/or Corequisite(s):

None.

Course Description:

This course introduces technical drafting and design practices as well as basic CAD (computer aided drafting). Topics include lettering, metric construction, technical sketching, orthographic projection, sections, intersections, development, fasteners, theory and applications of dimensioning and tolerances, pictorial drawing, and the preparation of working and detailed drawings.



COURSE SUMMARY

COURSE DESCRIPTION

This course introduces technical drafting and design practices as well as basic CAD (computer aided drafting). Topics include lettering, metric construction, technical sketching, orthographic projection, sections, intersections, development, fasteners, theory and applications of dimensioning and tolerances, pictorial drawing, and the preparation of working and detailed drawings.

MAJOR INSTRUCTIONAL AREAS

1. The worldwide graphic language for design
2. Layouts and lettering techniques
3. Technical sketching and shape description
4. Orthographic projection
5. 2D drawing representation
6. Full sections
7. Auxiliary views
8. Dimensioning
9. Axonometric views
10. Introduction to AutoCAD
11. Controlling the CAD drawing display
12. Basic CAD drawing commands
13. Basic CAD editing techniques

COURSE LEARNING OBJECTIVES

By the end of this course, you should be able to:

1. Utilize the graphic language to communicate design ideas.
2. Create technical drawings with typical drawing instruments and drafting equipment and demonstrate basic drafting, line work, and lettering skills.
3. Create both two- and three-dimensional drawings.
4. Explain the relationship between three-dimensional objects, multiview drawings, and isometric drawings and demonstrate their proper construction techniques.
5. Describe the procedures for constructing and managing a set of technical drawings.
6. Use AutoCAD to control the drawing display and view your drawing.
7. Use basic AutoCAD drawing commands to create new drawings.
8. Use basic AutoCAD editing commands to edit drawings.
9. Use AutoCAD to measure distance and get information about drawing objects.
10. Explain the differences and similarities between hand drafting and CAD.

COURSE OUTLINE

MODULE 1: THE GRAPHIC LANGUAGE AND TOOLS FOR DESIGN

COURSE LEARNING OBJECTIVES COVERED

- Utilize the graphic language to communicate design ideas.
- Create technical drawings with typical drawing instruments and drafting equipment and demonstrate basic drafting, line work, and lettering skills.

TOPICS COVERED

- Understanding the Role of Technical Drawings
- Engineering Design Stages
- Drafting Standards
- Understanding Types of Projections
- Measurement Systems
- Drawing Scales
- Lettering Standards
- Standard Layout Elements

MODULE LEARNING ACTIVITIES	GRADED	OUT-OF-CLASS TIME
Reading: Giesecke, F. (2012), Chapters 1 and 2.	No	4 hr
Lesson: Study the lesson for this module.	No	1.5 hr
Lab 1: Complete the lab titled “Lab Kit Inventory and Plate 1-Lettering.”	Yes	N/A
Lab 2: Complete the lab titled “Graphic Language.”	Yes	3 hr
Quiz: Prepare for Quiz 1.	No	1.5 hr

Total Out-Of-Class Activities: 10 Hours

MODULE 2: TECHNICAL SKETCHING AND GEOMETRIC CONSTRUCTION

COURSE LEARNING OBJECTIVES COVERED

- Create both two- and three-dimensional drawings.
- Explain the relationship between three-dimensional objects, multiview drawings, and isometric drawings and demonstrate their proper construction techniques.

TOPICS COVERED

- Understanding Technical Sketching Techniques
- Understanding Types of Projection Methods
- Geometric Constructions
- Orthographic Projection
- First- and Third-Angle Projection
- 2D Drawing Representation

MODULE LEARNING ACTIVITIES	GRADED	OUT-OF-CLASS TIME
Reading: Giesecke, F. (2012), Chapter 3, Chapter 4 (pp. 122–139), Chapter 5 (pp. 162–180), and Chapter 6 (pp. 202–211).	No	13 hr
Lesson: Study the lesson for this module.	No	2 hr
Discussion: Participate in the discussion titled “Technical Sketching.”	Yes	2 hr
Lab 1: Complete the lab titled “Sketch Orthographic Views.”	Yes	N/A
Lab 2: Complete the lab titled “Technical Sketching and Orthographic Projections.”	Yes	4 hr
Quiz: Take Quiz 1.	Yes	N/A
Project: Read and begin the project.	No	4 hr

Total Out-Of-Class Activities: 25 Hours

MODULE 3: VIEWS, DIMENSIONING, AND WORKING DRAWINGS

COURSE LEARNING OBJECTIVES COVERED

- Explain the relationship between three-dimensional objects, multiview drawings, and isometric drawings and demonstrate their proper construction techniques.
- Describe the procedures for constructing and managing a set of technical drawings.

TOPICS COVERED

- Necessary Views
- Section Views
- Dimensioning
- Working Drawings
- Assembly Drawings
- Drawing Management
- Parts List

MODULE LEARNING ACTIVITIES	GRADED	OUT-OF-CLASS TIME
Reading: Giesecke, F. (2012), Chapter 7 (pp. 243–250), Chapter 8 (pp. 301–313), Chapter 10 (pp. 362–381; 397–399), Chapter 11 (pp. 407–416), Chapter 13 and 14.	No	18 hr
Lesson: Study the lesson for this module.	No	2 hr
Discussion: Participate in the discussion titled “Importance of Section Views.”	Yes	N/A
Lab 1: Complete the lab titled “Freehand Section Views and Dimensioning.”	Yes	N/A
Lab 2: Complete the lab titled “Drawing Management and Axonometric Views.”	Yes	N/A
Project: Submit Project Part 1.	Yes	6 hr
Quiz: Prepare for Quiz 2.	No	2 hr

Total Out-Of-Class Activities: 28 Hours

MODULE 4: PERSPECTIVE DRAWING AND INTRODUCTION TO AUTOCAD

COURSE LEARNING OBJECTIVES COVERED

- Explain the relationship between three-dimensional objects, multiview drawings, and isometric drawings and demonstrate their proper construction techniques.
- Use AutoCAD to control the drawing display and view your drawing.
- Explain the differences and similarities between hand drafting and CAD.

TOPICS COVERED

- Perspective Drawing
- Introduction to AutoCAD
- Viewing Drawings in AutoCAD
- Comparing Hand Drafting with CAD

MODULE LEARNING ACTIVITIES	GRADED	OUT-OF-CLASS TIME
Reading: Giesecke, F. (2012), Chapter 16 (pp. 621–624 and pp. 627–631).	No	3 hr
Reading: ITT Tech Virtual Library> School of Study> School of Drafting and Design> Tutorial links> AutoCAD Services & Support> The Hitchhiker's Guide to AutoCAD Basics.	No	5 hr
Lesson: Study the lesson for this module.	No	2 hr
Discussion: Participate in the discussion titled “CAD Versus Hand Drafting.”	Yes	2 hr
Lab 1: Complete the lab titled “Perspectives.”	Yes	N/A
Lab 2: Complete the lab titled “Viewing a Drawing in AutoCAD.”	Yes	N/A
Quiz: Take Quiz 2.	Yes	N/A
Quiz: Prepare for Quiz 3.	No	2 hr

Total Out-Of-Class Activities: 14 Hours

MODULE 5: USING AUTOCAD TO CREATE AND EDIT DRAWINGS

COURSE LEARNING OBJECTIVES COVERED

- Use basic AutoCAD drawing commands to create new drawings.
- Use basic AutoCAD editing commands to edit drawings.
- Use AutoCAD to measure distance and get information about drawing objects.
- Explain the differences and similarities between hand drafting and CAD.

TOPICS COVERED

- Basic Drawing Commands in AutoCAD
- Basic Editing Commands in AutoCAD
- Measuring Distance

MODULE LEARNING ACTIVITIES	GRADED	OUT-OF-CLASS TIME
Reading: ITT Tech Virtual Library> School of Study> School of Drafting and Design> Tutorial links> AutoCAD Services & Support> The Hitchhiker's Guide to AutoCAD Basics.	No	4 hr
Lesson: Study the lesson for this module.	No	2 hr
Discussion: Participate in the discussion titled “AutoCAD Command Entry.”	Yes	2 hr
Lab 1: Complete the lab titled “Creating and Editing a Drawing in AutoCAD.”	Yes	N/A
Lab 2: Complete the lab titled “Measuring Distance in AutoCAD.”	Yes	N/A
Quiz: Take Quiz 3.	Yes	N/A
Project: Begin work on Project Part 2.	No	7 hr
Final Exam: Prepare for the final exam.	No	5 hr

Total Out-Of-Class Activities: 20 Hours

MODULE 6: PROJECT SUBMISSION AND FINAL EXAM

COURSE LEARNING OBJECTIVES COVERED

- Utilize the graphic language to communicate design ideas.
- Create technical drawings with typical drawing instruments and drafting equipment and demonstrate basic drafting, line work, and lettering skills.
- Create both two- and three-dimensional drawings.
- Explain the relationship between three-dimensional objects, multiview drawings, and isometric drawings and demonstrate their proper construction techniques.
- Describe the procedures for constructing and managing a set of technical drawings.
- Use AutoCAD to control the drawing display and view your drawing.
- Use basic AutoCAD drawing commands to create new drawings.
- Use basic AutoCAD editing commands to edit drawings.
- Use AutoCAD to measure distance and get information about drawing objects.
- Explain the differences and similarities between hand drafting and CAD.

MODULE LEARNING ACTIVITIES	GRADED	OUT-OF-CLASS TIME
Lesson: Study the lesson for this module.	No	1 hr
Discussion: Participate in the discussion titled “Importance of Isometric and Orthographic Views.”	Yes	2 hr
Project: Submit Project Part 2.	Yes	6 hr
Final Exam: Take the final exam.	Yes	N/A

Total Out-Of-Class Activities: 9 Hours

EVALUATION AND GRADING

EVALUATION CRITERIA

The graded assignments will be evaluated using the following weighted categories:

CATEGORY	WEIGHT
Lab	35%
Discussion	15%
Quiz	10%
Project	30%
Final Exam	10%
Total	100%

GRADE CONVERSION

The final grades will be calculated from the percentages earned in the course, as follows:

GRADE	PERCENTAGE
A (4.0)	90–100%
B+ (3.5)	85–89%
B (3.0)	80–84%
C+ (2.5)	75–79%
C (2.0)	70–74%
D+ (1.5)	65–69%
D (1.0)	60–64%
F (0.0)	<60%

LEARNING MATERIALS AND REFERENCES

REQUIRED RESOURCES

COMPLETE TEXTBOOK PACKAGE

- Giesecke, F. (2012). *Technical drawing with engineering graphics (Custom 14th ed.)*. Upper Saddle River, NJ: Prentice Hall.
- Davis, P., & Juneau, K. R. (2008). *Engineering drawing problem series 3 (3rd ed.)*. Upper Saddle River, NJ: Prentice Hall.

OTHER ITEMS

- DDT Drafting Kit
- AutoCAD Educational Software

RECOMMENDED RESOURCES

- Books and Professional Journals
 - Bertoline, G. (2011). *Fundamentals of graphics communication*. Glencoe, IL: McGraw-Hill.
 - Boothroyd, G. (2010). *Product Design for Manufacture and Assembly*. New York, NY: CRC Press.
 - Liebing, R. W. (2007). *Construction of Architecture: from design to build*. New York, NY: John Wiley & Sons.
 - Muller, E. J., & Grau, P.A. (2008). *Architectural Drawing and Light Construction*. Englewood Cliffs, NJ: Prentice Hall.
 - Ramsey, C. G., & Sleeper, H.R. (2010). *Architectural Graphic Standards for Residential Construction*. New York, NY: John Wiley & Sons.
- ITT Tech Virtual Library (accessed via Student Portal | <https://studentportal.itt-tech.edu>)
 - Basic Search>
 - AutoCAD For Dummies
- Other References
 - Autodesk.com

<http://knowledge.autodesk.com/learning>

INSTRUCTIONAL METHODS AND TEACHING STRATEGIES

The curriculum employs a variety of instructional methods that support the course objectives while fostering higher cognitive skills. These methods are designed to encourage and engage you in the learning process in order to maximize learning opportunities. The instructional methods include but are not limited to lectures, collaborative learning options, use of technology, and hands-on activities.

To implement the above-mentioned instructional methods, this course uses several teaching strategies, such as real life examples and hands-on exercises. Your progress will be regularly assessed through a variety of assessment tools including discussions, labs, quizzes, project, and a final exam.

OUT-OF-CLASS WORK

For purposes of defining an academic credit hour for Title IV funding purposes, ITT Technical Institute considers a quarter credit hour to be the equivalent of: (a) at least 10 clock hours of classroom activities and at least 20 clock hours of outside preparation; (b) at least 20 clock hours of laboratory activities; or (c) at least 30 clock hours of externship, practicum or clinical activities. ITT Technical Institute utilizes a “time-based option” for establishing out-of-class activities which would equate to two hours of out-of-class activities for every one hour of classroom time. The procedure for determining credit hours for Title IV funding purposes is to divide the total number of classroom, laboratory, externship, practicum and clinical hours by the conversion ratios specified above. A clock hour is 50 minutes.

A credit hour is an artificial measurement of the amount of learning that can occur in a program course based on a specified amount of time spent on class activities and student preparation during the program course. In conformity with commonly accepted practice in higher education, ITT Technical Institute has institutionally established and determined that credit hours awarded for coursework in this program course (including out-of-class assignments and learning activities described in the “Course Outline” section of this syllabus) are in accordance with the time-based option for awarding academic credit described in the immediately preceding paragraph.

ACADEMIC INTEGRITY

All students must comply with the policies that regulate all forms of academic dishonesty or academic misconduct. For more information on the academic honesty policies, refer to the Student Handbook and the School Catalog.

INSTRUCTOR DETAILS

Instructor Name	
Office Hours	
Contact Details	

(End of Syllabus)