

**ITT Technical Institute**  
**DT1230**  
**CAD Methods**  
**Onsite and Online Course**

**SYLLABUS**

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**Credit hours:** 4.5


**Contact/Instructional hours:** 56 (34 Theory Hours, 22 Lab Hours)

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

Prerequisites: DT1110 Introduction to Drafting and Design Technology or equivalent

**Course Description:**

This course examines computer-aided drafting (CAD) techniques utilizing CAD equipment. Hands-on projects include geometric construction, various projections, sections, auxiliaries, dimensioning, sketching, and detail drawing that is practiced and applied using proper CAD procedures. Maintenance of CAD drawing files through the use of operating system commands is applied and stressed.



## COURSE SUMMARY

### COURSE DESCRIPTION

This course examines computer-aided drafting (CAD) techniques utilizing CAD equipment. Hands-on projects include geometric construction, various projections, sections, auxiliaries, dimensioning, sketching, and detail drawing that is practiced and applied using proper CAD procedures. Maintenance of CAD drawing files through the use of operating system commands is applied and stressed.

### MAJOR INSTRUCTIONAL AREAS

1. Drawing Aids and Drafting Settings
2. Managing Object Properties
3. Advanced Editing Techniques
4. Drawing and Editing Complex Objects
5. Pattern Fills and Hatching
6. Adding Text and Tables
7. Dimensioning Drawings
8. Creating and Editing Text and Dimension styles
9. Managing Paper Space Layouts
10. Plotting and Publishing
11. Blocks and Xrefs in the CAD Environment

### 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 CAD and demonstrate basic drafting skills.
3. Conduct basic research on drafting techniques used in CAD.
4. Apply proper dimensioning practices according to the American National Standards Institute (ANSI).
5. Demonstrate the techniques required to create orthographic projections, sectional and auxiliary views, and various pictorial drawings.

6. Apply the procedures for constructing and managing a set of technical drawings.

## COURSE OUTLINE

### MODULE 1: DRAFTING WITH CAD

#### COURSE LEARNING OBJECTIVES COVERED

- Utilize the graphic language to communicate design ideas.
- Create technical drawings with CAD and demonstrate basic drafting skills.

#### TOPICS COVERED

- AutoCAD Drawing Display
- Lines, Arcs, and Circles in AutoCAD
- Creating Ellipses and Points
- Drawing Tools and Drafting Settings in AutoCAD

MODULE LEARNING ACTIVITIES	GRADED	OUT-OF-CLASS TIME
<b>Reading:</b> Richard, P., & Fitzgerald, J., Chapters 4 and 5.	No	7 hr
<b>Lesson:</b> Study the lesson for this module.	No	1.5 hr
<b>Discussion:</b> Participate in the discussion titled “Manual Drafting Versus AutoCAD.”	Yes	N/A
<b>Lab:</b> Complete the lab titled “Drawing Tools and Drafting Settings in AutoCAD.”	Yes	N/A
<b>Project:</b> Read and begin the project.	No	1 hr
<b>Quiz:</b> Prepare for Quiz 1.	No	1 hr

Total Out-Of-Class Activities: 10.5 Hours

## MODULE 2: USING EDITING TECHNIQUES

### COURSE LEARNING OBJECTIVES COVERED

- Utilize the graphic language to communicate design ideas.
- Create technical drawings with CAD and demonstrate basic drafting skills.
- Conduct basic research on drafting techniques used in CAD.

### TOPICS COVERED

- Managing Layers in AutoCAD
- Managing Object Properties
- Basic Editing Tools
- Advance Editing Tools

MODULE LEARNING ACTIVITIES	GRADED	OUT-OF-CLASS TIME
<b>Reading:</b> Richard, P., & Fitzgerald, J., Chapters 6-8.	No	8.5 hr
<b>Lesson:</b> Study the lesson for this module.	No	2 hr
<b>Quiz:</b> Take Quiz 1.	Yes	N/A
<b>Lab 1:</b> Complete the lab titled "Using Basic Editing Techniques."	Yes	N/A
<b>Lab 2:</b> Complete the lab titled "Using Advanced Editing Techniques."	Yes	N/A
<b>Research:</b> Submit the research titled "Line Types in AutoCAD."	Yes	4 hr
<b>Project:</b> Continue work on Project Part 1.	No	2 hr
<b>Quiz:</b> Prepare for Quiz 2.	No	1 hr

Total Out-Of-Class Activities: 17.5 Hours

## MODULE 3: CREATING COMPLEX DRAWINGS

### COURSE LEARNING OBJECTIVES COVERED

- Create technical drawings with CAD and demonstrate basic drafting skills.
- Conduct basic research on drafting techniques used in CAD.

### TOPICS COVERED

- Using Rectangles, Polygons, and Donuts in AutoCAD
- Drawing and Editing Multiple Polylines
- Creating and Editing Multiline Text
- Creating and Editing Tables in AutoCAD

MODULE LEARNING ACTIVITIES	GRADED	OUT-OF-CLASS TIME
<b>Reading:</b> Richard, P., & Fitzgerald, J., Chapters 9, 11, and 15.	No	7 hr
<b>Lesson:</b> Study the lesson for this module.	No	2 hr
<b>Quiz:</b> Take Quiz 2.	Yes	N/A
<b>Lab 1:</b> Complete the lab titled “Adding Text and Using Plotting and Publishing Options.”	Yes	N/A
<b>Lab 2:</b> Complete the lab titled “Drawing and Editing Complex Objects.”	Yes	N/A
<b>Research:</b> Submit the research titled “CAD Resources Websites.”	Yes	4 hr
<b>Quiz:</b> Prepare for Quiz 3.	No	1 hr

Total Out-Of-Class Activities: 14 Hours

## MODULE 4: DIMENSIONING DRAWINGS

### COURSE LEARNING OBJECTIVES COVERED

- Conduct basic research on drafting techniques used in CAD.
- Apply proper dimensioning practices according to the American National Standards Institute (ANSI).

### TOPICS COVERED

- Dimensioning Commands and the Dimension Toolbar
- Utilizing GD&T Symbols in AutoCAD
- Creating and Modifying Dimension Styles

MODULE LEARNING ACTIVITIES	GRADED	OUT-OF-CLASS TIME
<b>Reading:</b> Richard, P., & Fitzgerald, J., Chapter 13.	No	6 hr
<b>Lesson:</b> Study the lesson for this module.	No	2 h.
<b>Quiz:</b> Take Quiz 3.	Yes	N/A
<b>Lab:</b> Complete the lab titled "Dimensioning Drawings."	Yes	N/A
<b>Research:</b> Submit the research titled "American National Standard Institute (ANSI)."	Yes	3 hr
<b>Project:</b> Submit Project Part 1.	Yes	3 hr
<b>Quiz:</b> Prepare for Quiz 4.	No	1 hr

Total Out-Of-Class Activities: 15 Hours

## MODULE 5: MANAGING PAPER SPACE LAYOUTS

### COURSE LEARNING OBJECTIVES COVERED

- Utilize the graphic language to communicate design ideas.
- Apply proper dimensioning practices according to the American National Standards Institute (ANSI).
- Demonstrate the techniques required to create orthographic projections, sectional and auxiliary views, and various pictorial drawings.
- Apply the procedures for constructing and managing a set of technical drawings.

### TOPICS COVERED

- Using and Editing Hatch Patterns
- Configuring Various Plotting Devices
- Managing Layers and Layout Viewports
- Configuring Various Plotting Devices

MODULE LEARNING ACTIVITIES	GRADED	OUT-OF-CLASS TIME
<b>Reading:</b> Richard, P., & Fitzgerald, J., Chapters 10 and 14.	No	8 hr
<b>Lesson:</b> Study the lesson for this module.	No	2 hr
<b>Quiz:</b> Take Quiz 4.	Yes	N/A
<b>Lab 1:</b> Complete the lab titled "Pattern Fills and Hatching."	Yes	N/A
<b>Lab 2:</b> Complete the lab titled "Managing Paper Space Layout."	Yes	N/A
<b>Research:</b> Submit the research titled "AIA CAD Layering Guidelines."	Yes	3 hr
<b>Project:</b> Begin work on Project Part 2.	No	2 hr

Total Out-Of-Class Activities: 15 Hours



## MODULE 6: CREATING ePORTFOLIO

### COURSE LEARNING OBJECTIVES COVERED

- Utilize the graphic language to communicate design ideas.
- Create technical drawings with CAD and demonstrate basic drafting skills.
- Demonstrate the techniques required to create orthographic projections, sectional and auxiliary views, and various pictorial drawings.
- Apply the procedures for constructing and managing a set of technical drawings.

### TOPICS COVERED

- Using Backup and Autosave Settings in AutoCAD
- Using Object Linking and Embedding Objects in AutoCAD Drawings
- Working with Various CAD File Formats

MODULE LEARNING ACTIVITIES	GRADED	OUT-OF-CLASS TIME
<b>Reading:</b> Richard, P., & Fitzgerald, J., Chapter 18	No	4 hr.
<b>Lesson:</b> Study the lesson for this module.	No	2 hr.
<b>Discussion:</b> Participate in the discussion titled "Traditional Designing Versus Computer-Aided Designing."	Yes	N/A
<b>Project:</b> Submit Project Part 2.	Yes	3 hr.

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
Research	15%
Labs	35%
Quiz	15%
Discussion	10%
Project	25%
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

Richard, P., & Fitzgerald, J. (2014). *Introduction to AutoCAD 2015: A modern perspective (1st ed.)*. Upper Saddle River, NJ: Prentice Hall.

### RECOMMENDED RESOURCES

- Books and Professional Journals
  - Bethune, J. (2014). *Engineering graph w/AutoCAD 2015 (15th ed.)*. Upper Saddle River, NJ: Prentice Hall.
  - Shrock, R. C. & Heather, S. (2015). *Advanced AutoCAD 2015*. South Norwalk, CT: Industrial Press.
  - Kahn, L. (2014). *Tiny homes on the move: Wheels and water*. Bolinas, CA: Shelter Publications.
  - McMorrough, J. (2015). *Drawing for architects*. Greater London, UK: Waterstones.
  - Plantenberg, K. (2014). *Engineering graphics essentials with AutoCAD 2015*. Mission, KS: SDC Publications.
  - Rowan, G. (2013). *Compact houses: 50 creative floor plans for well-designed small homes*. North Adams, MA: Storey Publishing.
  - Shih, R. H. (2014). *AutoCAD 2015 tutorial - second level: 3D modeling*. Mission, KS: SDC Publishing.
- Professional Associations
  - Association for Computer Aided Design in Architecture (ACADIA)

The is an international network of digital design researchers and professionals. We facilitate critical investigations into the role of computation in architecture, planning, and building science, encouraging innovation in design creativity, sustainability, and education.

(<http://acadia.org>)

- Other References
  - U.S. General Services Administration  
[http:// www.gsa.gov/portal/content/104697](http://www.gsa.gov/portal/content/104697)

## 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 hands-on labs. Your progress will be regularly assessed through a variety of assessment tools including discussions, quizzes, labs, research, and a project.

## 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)*