

**Course Name: RWC 1400 CAD**  
**Computer Aided Drafting and Design**



**Syllabus – 2019/2020**

**RESILIENCY AT WORK 2.0®**

[www.rw2.education](http://www.rw2.education)

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**Session Schedule:**

**Morning: Tuesday, Wednesday, Thursday – 9am – 12:45pm, OR**

**Evening: Tuesday, Wednesday, Thursday – 6pm – 9:45pm**

**Saturdays: 1<sup>st</sup> and 3<sup>rd</sup>, 9am-12noon**

**Program Catalog:** <https://www.clec-education.com/resources/>

**Prerequisite:** Participants should be familiar with the Microsoft operating system, and have the ability to use a keyboard and a mouse. No previous computer-aided drafting and design (CAD) experience is required.

**Drop/Withdraw Period:** The first two (2) weeks of the program is the drop period. Any decision to discontinue the program after week two is considered the withdraw period and no refunds are given.

**Participants must notify the instructor in advance of any absence or attendance matters.**

Richard, P. & Fitzgerald J. (2017). Introduction to AutoCAD 2017: A Modern Perspective. Upper Saddle River, New Jersey: Pearson Publication, Inc. publishing as Peachpit Press. ISBN-13: 978-0134506951.

**Software:** AutoCAD 2017

**Reference Books:**

Cheryl R. Shrock & Steve Heather. Advanced AutoCAD 2018. Industrial Press. 32 Haviland, South Norwalk, CT

Shawna Lockhart 2018. Tutorial Guide to AutoCAD 2018. SDC Publications. Mission, KS

**Course Summary**

**Instructional Areas**

1. Introduction to AutoCAD
2. Drawing Display

3. Drawing Commands
4. Drawing Aids and Drafting Settings
5. Object Properties
6. Basic Editing Techniques
7. Advanced Editing Techniques
8. Drawing and Editing Complex Objects
9. Pattern Fills and Hatching
10. Texts and Tables
11. Dimensioning
12. Model Space & Paper Space
13. Managing Paper Space Layouts
14. Plotting and Publishing
15. Blocks & Dynamic Blocks
16. Xrefs

### **Course Objectives**

1. Use of graphic language to communicate design ideas.
2. Create technical drawings with CAD and demonstrate drafting skills.
3. Apply proper dimensioning practices according to the American National Standards Institute (ANSI) and demonstrate Geometric Dimensioning and Tolerancing (GD&T) as a design language for size, shape, and geometric characteristics of manufactured parts.
4. Demonstrate the techniques required to create orthographic projections, sectional and auxiliary views.
5. Utilize various design software applications and equipment for solving design problems.
6. Apply the procedures for constructing and managing a set of technical drawings for construction

### **Other Required Resources:**

- Computer running Windows 7 or above with Internet connection (Provided by program, unless otherwise noted.)
- AutoCAD 2017, (Participant not required to purchase.)
- USB Memory Flash Drive/Thumb Drive – 64 GB or more
- Three-ring binder to organize notes, hand-outs, assignments, etc., paper, pencil, pen

### **Course Outline**

#### ***Unit 1: INTRODUCTION TO AUTOCAD***

Upon completion of this unit, students are expected to:

- Communicate to others using the CAD environment.
- Describe the management and saving of files in technical graphics.
- Manage paper space layouts and plotting within the CAD environment.

#### **GRADED ACTIVITIES**

<b>READING</b>	<b>Grading</b>	<b>Activity/Deliverable Title</b>	
<ul style="list-style-type: none"> <li>Paul Richard Chapters 1-2</li> </ul>	Assignment	Unit 1 Assignment 1: Benefits of CAD in Technical Graphic Communication	
	Lab	Unit 1 Lab 1: Introduction to AutoCAD	
		Unit 1 Lab 2: Exploring Data Input Methods	
		Unit 1 Lab 3: Quickstart in AutoCAD	
		Unit 1 Lab 4: Creating and Plotting a Drawing	

***Unit 2: CONTROLLING THE DRAWING DISPLAY AND BASIC DRAWING COMMANDS***

Upon completion of this unit, students are expected to:

- Demonstrate basic CAD drafting skills.
- Use display commands to control the display environment.
- Create multiple viewports in model space.
- Apply AutoCAD's drawing commands.
- Prepare a drawing setup for use.
- Create technical drawings demonstrating proper use of AutoCAD line, circle, arc, point, and ellipse commands.
- Compare various coordinate entry methods.

<b>READING ASSIGNMENT</b>	<b>GRADED ACTIVITIES</b>		
	<b>Grading</b>	<b>Activity/Deliverable Title</b>	
<ul style="list-style-type: none"> <li>Paul Richard Chapters 3-4</li> </ul>	Assignment	Unit 2 Assignment 1: AutoCAD Basics	
	Quiz	Unit 2 Quiz 1	
	Lab	Unit 2 Lab 1: AutoCAD Drawing Display	
		Unit 2 Lab 2: Establishing Units and Drawing Limits	
		Unit 2 Lab 3: Lines, Arcs, and Circles in AutoCAD	
		Unit 2 Lab 4: Creating Ellipses and Points, and Measuring in AutoCAD	

**Unit 3: DRAWINGS AIDS AND DRAFTING SETTINGS AND MANAGING OBJECT PROPERTIES**

Upon completion of this unit, students are expected to:

- Utilizing drawing aids
- Utilize grid, snap, and ortho mode settings in the creation of a technical drawing
- Assess the importance of object snaps
- Manage object properties
- Manage the value of layers and layer filters

READING ASSIGNMENT	GRADED ACTIVITIES / DELIVERABLES		
	Grading	Activity/Deliverable Title	
Paul Richard Chapters 5-6	Assignment	Unit 3 Assignment 1: Chapter Projects	
	Quiz	Unit 3 Quiz 2	
	Lab	Unit 3 Lab 1: Drawing Tools	
		Unit 3 Lab 2: Drafting Settings	
		Unit 3 Lab 3: Managing Layers	
	Unit 3 Lab 4: Managing Object Properties		

**Unit 4: BASIC AND ADVANCED EDITING TECHNIQUES**

Upon completion of this unit, students are expected to:

- Apply AutoCAD's editing commands.
- Select objects for editing in AutoCAD.
- Utilize erase, copy, move, rotate, stretch, and scale commands in a technical drawing.
- Assess the use of grips for object editing.
- Utilize offset, array, trim, extend, fillet, and chamfer commands in a technical drawing.
- Demonstrate the ability to join multiple objects in AutoCAD.

READING ASSIGNMENT	GRADED ACTIVITIES / DELIVERABLES		
	Grading	Activity/Deliverable Title	
Paul Richard Chapters 7-8	Assignment	Unit 4 Assignment 1: Editing Tools	
	Quiz	Unit 4 Quiz 3	
	Lab	Unit 4 Lab 1: Selecting Objects for Editing	
		Unit 4 Lab 2: Basic Editing Tools	
		Unit 4 Lab 3: Using Grips to Edit	
	Unit 4 Lab 4: Advanced Editing Tools		
	Project	Project 1	

**Unit 5: DRAWING AND EDITING COMPLEX OBJECTS**

Upon completion of this unit, students are expected to:

- Demonstrate the ability to draw and edit complex objects in AutoCAD.
- Utilize polylines, rectangle, polygon, and donut commands in AutoCAD.
- Apply editing commands to polylines.

READING ASSIGNMENT	GRADED ACTIVITIES / DELIVERABLES		
	Grading	Activity/Deliverable Title	
<ul style="list-style-type: none"> <li>• Paul Richard Chapter 9</li> </ul>	Assignment	Unit 5 Assignment 1: Complex Shapes	
	Quiz	Unit 5 Quiz 4	
	Lab	Unit 5 Lab 1: Drawing and Editing Polylines	
		Unit 5 Lab 2: Using Rectangles, Polygons, and Donuts	
		Unit 5 Lab 3: Drawing and Editing Multiple Polylines	

**Unit 6: PATTERN FILLS AND HATCHING**

Upon completion of this unit, students are expected to:

- Delineate various pictorial drawings. Utilize the hatch command to distinguish materials in a technical drawing.
- Create a technical drawing with a gradient fill pattern.
- Demonstrate effective use of hatch editing commands in AutoCAD.

READING ASSIGNMENT	GRADED ACTIVITIES / DELIVERABLES		
	Grading	Activity/Deliverable Title	Grade Allocation (%)
<ul style="list-style-type: none"> <li>• Paul Richard Chapter 10</li> </ul>	Assignment	Unit 6 Assignment 1: Hatch Patterns and Fills	1.5%
	Quiz	Unit 6 Quiz 5	1.67%
	Lab	Unit 6 Lab 1: Understanding Hatch Patterns	1%
		Unit 6 Lab 2: Hatching	1%
		Unit 6 Lab 3: Editing Hatch Patterns	1%

**Unit 7& 8: ADDING TEXT AND TABLES**

Upon completion of this unit, students are expected to:

- Assess the use of multilines in AutoCAD.
- Create text in a technical drawing.
- Employ settings to control text appearance.
- Create multiline and single line text in a technical drawing.
- Edit text in a technical drawing.
- Appraise the use of tables in a technical drawing.

READING ASSIGNMENT	GRADED ACTIVITIES / DELIVERABLES			
	Grading	Activity/Deliverable Title		
<ul style="list-style-type: none"> <li>• Paul Richard Chapters 11-12</li> </ul>	Assignment	Unit 7 Assignment 1: Text in AutoCAD		
	Quiz	Unit 7 Quiz 6		
	Lab	Unit 7 Lab 1: Appearance of Text Using Styles and Fonts		
		Unit 7 Lab 2: Create and Edit Text		
		Unit 7 Lab 3: Create and Edit Tables		
Project	Project 2			

**Unit 9: DIMENSIONING DRAWINGS**

Upon completion of this unit, students are expected to:

- Exemplify proper dimensioning practices.
- Identify the functions of the dimension toolbar in AutoCAD.
- Compare types of dimensions.
- Create dimensions in a technical drawing.
- Compare datum and chain dimensioning in a technical drawing.
- Utilize Geometric Dimension and Tolerancing (GD&T) symbols.
- Manage dimension styles in AutoCAD.
- Demonstrate effective use of dimension modification commands in AutoCAD.

READING ASSIGNMENT	GRADED ACTIVITIES / DELIVERABLES			
	Grading	Activity/Deliverable Title		
<ul style="list-style-type: none"> <li>• Paul Richard Chapter 13</li> </ul>	Assignment	Unit 8 Assignment 1: Dimensioning		
	Quiz	Unit 8 Quiz 7		
	Lab	Unit 8 Lab 1: Dimensioning Commands and the Dimension Toolbar		
		Unit 8 Lab 2: Creating and Modifying Dimension Styles		
		Unit 8 Lab 3: Utilizing GD&T Symbols in AutoCAD		

**Unit 10 & 11: MANAGING PAPER SPACE LAYOUTS AND PLOTTING AND PUBLISHING**

Upon completion of this unit, students are expected to:

- Manage paper space layouts and plotting within the AutoCAD environment.
- Apply a paper space layout to a technical drawing.
- Manage a space layout in AutoCAD.
- Assess the value of dimensioning in paper space.

READING ASSIGNMENT	GRADED ACTIVITIES / DELIVERABLES		
	Grading	Activity/Deliverable Title	
<ul style="list-style-type: none"> <li>• Paul Richard Chapters 14-15</li> </ul>	Assignment	Unit 9 Assignment 1: Completing Drawings	
	Quiz	Unit 9 Quiz 8	
	Lab	Unit 9 Lab 1: Setting the Page Size of a Layout	
		Unit 9 Lab 2: Controlling the Final Look of the Plotted Drawing	
		Unit 9 Lab 3: Configuring Various Plotting Devices	

**Unit 12& 13: BLOCKS AND XREFS IN THE CAD ENVIRONMENT**

Upon completion of this unit, students are expected to:

- Apply blocks and Xrefs in the CAD setting.
- Create blocks in AutoCAD.
- Insert blocks in AutoCAD.
- Assess the value of blocks in the CAD environment.
- Compare the attributes of blocks and Xrefs in AutoCAD.
- Transmit drawings with Xrefs.

READING ASSIGNMENT	GRADED ACTIVITIES / DELIVERABLES		
	Grading	Activity/Deliverable Title	
<ul style="list-style-type: none"> <li>• Paul Richard Chapters 16-18</li> <li>• Familiarizing 3D Commands</li> <li>• Learning Certification</li> </ul>	Assignment	Unit 10 Assignment 1: Paper Space	
	Quiz	Unit 10 Quiz 9	
	Lab	Unit 10 Lab 1: Creating and Using Blocks in AutoCAD	
		Unit 10 Lab 2: Externally Referenced File Usage in AutoCAD	
		Unit 10 Lab 3: Xref Editing through Both In- Place and Drawing File Modification	

<i>Unit 14: COURSE REVIEW AND FINAL EXAM</i>			
READING ASSIGNMENT	GRADED ACTIVITIES		
	Grading	Activity/Deliverable Title	
No reading assignment	Exam	Final Exam & Submission of Project Work	

## Evaluation and Grading

### Evaluation Criteria

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

Category	Weight
Assignment	15%
Lab	22%
Project	18%
Quiz	10%
Exam	15%
Attendance & Timeliness	20%
<b>TOTAL</b>	<b>100%</b>

### Grade Conversion

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

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

**Attendance:** Attendance is evaluated on a session-by-session basis. It is important that participants attend every session, lab, presentation, and field trips when provided.

Participants may be subject to being dropped or withdrawn for missing three (3) consecutive sessions or a total of six sessions. (See RW2 Catalog for more details.) Coming to sessions late or leaving early is counted as half (½) of a missed session. Participants must notify the instructor of any absence or attendance matters.

Any participant deciding to drop or withdraw from the program is responsible to email or fill out a hard copy of the appropriate paperwork with an RW2 staff member.



**Tutoring:** Tutoring sessions are available to assist participants in understanding the concepts and techniques in AutoCAD in addition to those provided by text tutorials. All participants may take advantage of the tutoring; while those who are struggling to completing assignments, may be required to attend. Tutoring sessions are held two (2) times per month on Saturdays. (The instructor and participants decide on which to Saturdays each more or the instructor may decide.)

**Incomplete Work:** The Incomplete grade, or “I” grade, is a temporary grade designed for participants who, because of documented illness or other documented circumstance beyond their control, are unable to complete their program within the start and end date of the program. A participant must have completed at least 75 percent of the program with a grade average of “C” or better and have good attendance, before the end of the program.

The participant must meet with the instructor to prepare an Incomplete Grade Contract and make arrangements to complete the course on or before the time agreed upon or, if granted, in the appropriate subsequent program session. If the participant does not complete the program work by the established deadline, the instructor will change the “I” to the letter grade stipulated in the contract. Incomplete grades not converted to a letter grade by the instructor as stipulated in the contract will automatically become an “F”.

**Educational Integrity/Honest:** Every participant is expected to follow the Program’s regulations and guidelines relating to academic honesty. Please refer to the Participant Handbook.

**Educational Dishonesty includes any or all of the following as applicable:**

1. Plagiarism - the intentional use of the ideas or words of someone else as the participant’s own work, e.g. assignment.
2. Cheating during examinations and assessments, whether by copying from another participant or by using information in the form of unauthorized aids brought to the examination or assessment is prohibited.
3. Submitting the work for any assignment that was done by another participant or other person is prohibited.
4. Submitting the same work in more than one program or session to fulfill the requirements in another program or session, without prior approval of both instructors is prohibited.
5. Using a false name or signing the name of another individual without proper authorization in connection with any course work and for attendance is prohibited.

Disciplinary measures will be taken for any participant suspected of educational dishonesty. At no point in this program is it acceptable for a participant to submit someone else’s work as their own, or use the ideas of someone else as their own. It is also unacceptable for a participant to share his/her own work with another participant. Any incidence of cheating will result in a grade or score equivalent to an “F” for the work.

**American with Disabilities Act:** In compliance with the American with Disabilities Act, RW2 makes every attempt to provide equal access for persons with disabilities. If you need an accommodation due to a disability, please contact an RW2 staff member at 816-875-0111. (See the RW2 catalog for more details.)

**Code of Conduct:** Participants are expected to conduct themselves in a manner consistent with the purpose of the program. Conduct deemed unacceptable toward maintaining a proper education and training environment will subject the participant to the Program's disciplinary action. The Code of Conduct is outlined in the Participant Handbook.

**Sexual Harassment:** Sexual harassment is prohibited by Federal and State law, as well as RW2's policy. If you feel that you have been subjected to sexual harassment, please discuss this with the Program Administrator. (See the RW2 catalog for more details.)

**Grievance Procedure:** When a participant feels his/her rights or freedoms have been violated, he/she has the right to use the grievance procedure to seek recourse. The Resiliency at Work 2.0 grievance procedure is outlined in the catalog.

**Program Closures Due to Inclement Weather:** In the event of inclement weather, notices of closing, late starts, etc. will be communicated through email and/or through recorded messages on the Program phone line: 816-875-0111. **Please note that evening and Saturday sessions may still be open even if day sessions are cancelled.**

**Computer and Computer Technology Usage:** All computers used in the RW2 program must be strictly in support of and for acceptable education and training purposes. It is not acceptable to use any computer at any of the RW2 program sites for purposes, which violate any federal law or state law. It is not acceptable to use any computer at RW2 program sites in a manner that is harmful or harassing, including accessing sexual materials on the Internet. It is not acceptable to use any computers at RW2 program sites in a manner that disrupts network use and service. It is not acceptable to use any computers in the RW2 program for commercial activities, such as, but not limited to, commercial solicitation of business.

It is the responsibility of the computer user to comply with the above and other regulations. Reported violations of these policies may result in disciplinary action and the participant may be subject to forfeiture of their computer use privileges. (See the RW2 catalog for more details.)

**Cell Phones:** During program sessions, pagers and cell phones should be on silent mode and put away. Participants are not allowed to take or return calls or pages during sessions.

**Smoking Policy:** RW2 abides by the policies of the facilities where the programming is offered. The facilities where RW2 holds programs are "SMOKE- FREE" facilities. **If smoking is permitted at a program site,** participants will be informed by an RW2 staff member about any designated areas.

**The instructor and RW2 administration reserve the right to update the syllabus to meet programmatic and session objectives.**

