NEW MILFORD PUBLIC SCHOOLS
New Milford, Connecticut

Architectural Drafting III

February 2015

Approved by the Board of Education
March 10, 2015

New Milford's Mission Statement

The mission of the New Milford Public Schools, a collaborative partnership of students, educators, family and community, is to prepare each and every student to compete and excel in an ever-changing world, embrace challenges with vigor, respect and appreciate the worth of every human being, and contribute to society by providing effective instruction and dynamic curriculum, offering a wide range of valuable experiences, and inspiring students to pursue their dreams and aspirations.

Architectural Drafting III

This course is intended to be an extension of Architectural Drafting II with all its practices. Students will be required, through the use of computer-aided drafting (CAD), to complete instruction in mastering the AutoCAD 3D Modeling commands, Internet access, and various customizing techniques. These topics are covered in an easy-to-understand sequence, and progress in a way that allows the student to become comfortable with the commands as their knowledge builds. Through the course of the first semester, students will be required to develop a set of plans graphically using the CAD system. During the second semester, the students will develop and build a scale model of the same structure.

Common Core State Standard Key

Connecticut Technology Education Standards

EKS.02.01	Knowledge and Skills
EKS.05	Essential Knowledge and Skills
EKS.05.01	Essential Knowledge and Skills
EKS.05.03	Essential Knowledge and Skills
EKS.05.05	Essential Knowledge and Skills
EKS.05.06	Essential Knowledge and Skills
EKS.05.08	Essential Knowledge and Skills
EKS.05.11	Essential Knowledge and Skills
EKS.08	Essential Knowledge and Skills
EKS.08.02	Essential Knowledge and Skills
EKS.08.07	Essential Knowledge and Skills
EKS.09	Essential Knowledge and Skills
CADD.02	Knowledge and Skills
CADD.02.11	Knowledge and Skills
CADD.03	Knowledge and Skills
CADD.05.08	Knowledge and Skills
CADD.5.04	Knowledge and Skills
CADD.09	Knowledge and Skills
CADD.02.07	Knowledge and Skills
EKS.05.02	Essential Knowledge and Skills
CADD.07	Knowledge and Skills

Pacing Guide

UNIT #	TITLE	WEEKS	PAGES
1	Review - Basic Commands	2	7-10
2	Review - Making Your Drawings Precise	2	11-13
3	Review - Drawing Organization and Information	2	14-16
4	Review - Creating More Complex Drawings	2	17-19
5	Review - Preparing to Print	2	20-22
6	Introduction to 3D Drawing	3	23-25
7	3D Coordinates and Construction	3	26-28
8	Understanding User Coordinates and Model Space Viewports	2	29-31
9	3D Surface Modeling Techniques and Editing	3	32-34
10	Viewing and Displaying 3D Models	2	35-37
11	3D Text and Dimensioning	2	38-40
12	Introduction to Shading and Rendering	3	41-43
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14	Solid Model Construction and Features	3	46-48
15	Solid Modeling Editing	3	49-51
16	Solid Model Display and Analysis	3	52-54

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Committee Member(s): Joe Neff Unit 1: Review – Basic Commands	Course/Subject: Architectural Drafting III Grade Level: 11-12 # of Weeks: 2
Identify Desired Results	
Common Core State Standards	

- Identify basic geometric elements (i.e., line, circle, rectangle, sphere, and cube). **CADD.02.11**
- Identify and demonstrate positive work behaviors and personal qualities needed to be employable. **EKS.08**

Enduring Understandings Generalizations of desired understanding via essential questions (Students will understand that …)	**Essential Questions** Inquiry used to explore generalizations
- Students will review the following: - AutoCAD software - Know the screen layout - Use the command line and keyboard to complete drawings - Use the pointing device - Open an existing drawing - Use the Cartesian workspace to complete drawings - Students will review the following basic drawing and editing commands: - Be able to draw lines - Be able to erase an object - Use direct distance entry to find two points - Use polar tracking to find points on the screen - Draw various rectangles and polygons - Draw circles, using the five different ways - Drawing using GRID and SNAP - Saving one's work - Exiting AutoCAD	- Why are the eight main areas of AutoCAD graphics screen? - How does one switch from a drawing window to a text window? - Name all of the buttons on your pointing device? Explain the use of each one? - How does one cancel a command at the keyboard and why is it important to know how to do it? - How and why are points specified in AutoCAD's Cartesian workspace?

Expected Performances
What students should know and be able to do

Students will know the following:
- The AutoCAD workspace and user interface
- Basic drawing, editing and viewing tools
- The organization of drawing objects on layers
- Inserting reusable symbols (blocks)
- Preparing a layout to be plotted
- Adding text, hatching, and dimensions

Students will be able to do the following:
- Start AutoCAD
- The basic layout of the AutoCAD screen
- Use the command line and keyboard with AutoCAD
- Use your pointing device in AutoCAD
- Open an existing drawing
- Use AutoCAD's Cartesian workspace
- Draw lines, rectangles, and circles
- Erase objects
- Draw with GRID, and SNAP
- View a drawing with Zoom and PAN
- Undo commands
- Save your work
- Exit AutoCAD

Character Attribute(s)

- Responsibility
- Respect

Technology Competencies

- Students collaborate with peers and others to solve problems and to develop solutions using technology tools and resources.

Develop Teaching and Learning Plan

Teaching Strategies:
- "NAME the STEP" technique. Assign each student a different basic command. Have each student list the step-by-step procedure needed to perform the basic command. Then the student will present to the class their steps.
- If needed the teacher will use the data projector to show the students steps on the various commands needed to draw a simple drawing

Learning Activities:
- Students will practice commands using the keyboard.
- Students will practice using their pointing device.
- Students will use the Select File Dialog
- Using the Coordinate display to locate the position of various (X, Y) points in the drawing.
- Completion of drawings #1 - #8

- Teacher uses active learning to help the students complete their assignments. Using the computer and by listening to the lecture, students begin work on completing their drawings. - Problem-Based Learning is a method that challenges students to "learn to learn" by working in groups to seek solutions to problems. The students will work in groups to complete the drawings assigned. (#1 - #8) - Teacher will hand out drawing #1 to the group. When the drawing is finished, the teacher will check the drawing and then the students can move onto the next drawing.	

Assessments	
Performance Task(s) Authentic application to evaluate student achievement of desired results designed according to GRASPS (one per marking period)	**Other Evidence** Application that is functional in a classroom context to evaluate student achievement of desired results
Goal: Enable students to create a basic 2D drawing in AutoCAD **Role**: Instructor/Teacher **Audience**: Students in Architectural Drafting III **Situation**: Students are given drawings to complete that show the teacher they understand the basic command needed to complete the drawing **Product**: Correct completion of 2D drawings (#1 - #8) **Standards for Success**: Completion for drawing #1-#8 using departmental rubrics	- Students will review how to start, save and exit AutoCAD by completing drawing #1. - Students will review the basic layout of the AutoCAD screen. - Students will review how to use the command line and keyboard with AutoCAD by completing drawing #2. - Students will review how to use your pointing device in AutoCAD - review how to open an existing drawing by opening an saved drawing (drawings #1 & #2) - Students will review AutoCAD's Cartesian workspace by completing drawing #3 - Students will be able to draw lines, rectangles, and circles by completing drawing #4. - Students will be able erase objects by completing drawing #5

	• Students will be able draw with GRID, and SNAP by completing drawing #6. • Students will be able view a drawing with Zoom and PAN by completing drawing #7 • Students will be able undo commands by completing drawing #8 • Self Check: Getting Started with AutoCAD (7 questions) • Unit quiz • Observation of student work • Finish drawings #1 - #8

Suggested Resources

- Madsen, David; Shumaker, Terence. AutoCAD and its applications-Advanced. Tinley Park, Illinois: The Goodheart-Willcox Company, 2001.
- AutoCAD software
- Supplemental worksheets
- Drawings #1 - #8

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Committee Member(s): Joe Neff Unit 2: Review - Making Your Drawings More Precise	Course/Subject: Architectural Drafting III Grade Level: 11 - 12 # of Weeks: 2

Identify Desired Results

Common Core State Standards

- Model behaviors that demonstrate active listening. **EKS.02.01**
- Evaluate ideas, proposals, and solutions to problems. **EKS.05.05**

Enduring Understandings Generalizations of desired understanding via essential questions (Students will understand that …)	Essential Questions Inquiry used to explore generalizations
- Students will draw the following items with precision in AutoCAD: - Using Object Snap - Object Snap Overrides - Polar Tracking Settings - Object Snap Tracking - Students will make changes to the following objects in their drawings: - Selecting Objects for Editing - Moving Objects - Copying Objects - Rotating Objects - Scaling Objects	- Why do we need to use Object Snap? - How would you set Polar tracking so it snaps to different degrees and what is the advantage of it? - What settings on the Status Bar need to be turned on to use Object Snap tracking? - MOVE, COPY, ROTATE, and SCALE all use a base point. What is a base point? - What are the basic steps when editing an object, regardless of command?

Expected Performances
What students should know and be able to do

Students will know the following:
- How to snap to exact points on objects using OSNAP
- How to use object snap overrides
- How to draw lines at specific angles with Polar tracking
- How to specify distances with Polar Snap
- How to find exact locations with Object Snap Tracking
- How to select objects for editing
- How to move objects
- How to copy objects
- How to rotate objects
- How to scale objects

Students will be able to do the following:
- Set Object Snaps and use them to draw a fence line and rooflines.
- Use a variety of Object Snaps in conjunction with the LINE and CIRCLE commands.
- Use the Parallel and Extension object snaps.
- Adjust the Polar Tracking settings.

- Use Object Snap Tracking to draw process lines in a schematic diagram.
- Use several techniques to select objects for use of the ERASE command.
- Use the MOVE command.
- Use the COPY command.
- Use the ROTATE command.
- Use the COPY and SCALE command.

Character Attribute(s)

- Honesty
- Cooperation

Technology Competencies

- Identify, describe, and utilize the basic hardware and operating systems used in CADD.

Develop Teaching and Learning Plan

Teaching Strategies:	Learning Activities:
- Teacher uses the "Observation" technique. The teacher just hands out the worksheets to the students without any instruction. The teacher "observes the students as they perform the commands. Once they finish a command, the teacher signs off on that command. - Teacher will use the data projector if necessary to show the students how to use the basic editing commands - Teacher will assign drawings for students to do using the basic editing commands - Teacher will give the students exercises that demonstrate how to use the various commands - Teacher will integrate technology by having the students use the computer and software to complete the assignments (drawings #9 - #14)	- Students will create a top view of a part by tracking the locations from the existing front and side views - Students will use Object Snap Tracking to draw process lines - Students will use several techniques to select objects for use with the ERASE command - Students will use the MOVE command to place furniture into position in a floor plan - Students will rotate a chair and PC and then COPY the entire set of furniture to other locations

Assessments

Performance Task(s) Authentic application to evaluate student achievement of desired results designed according to GRASPS (one per marking period)	Other Evidence Application that is functional in a classroom context to evaluate student achievement of desired results
Goal: Enable students to create a basic 2D drawing in AutoCAD **Role**: Instructor/Teacher **Audience**: Students in Architectural Drafting III classes **Situation**: Students are given drawings to complete that show the teacher they understand the basic command needed to complete the drawing **Product**: Correct completion of 2D drawings (#9 - #14) **Standards for Success**: Completion for drawing #9-#14 using departmental rubrics	• Students will create a top view of a part by tracking the locations from the existing front and side views (drawing #9) • Students will use Object Snap Tracking to draw process lines by completing drawing #9. • Students will use several techniques to select objects for use with the ERASE command by completing drawing #10 • Students will use the MOVE command to place furniture into position in a floor plan by completing drawing #11 • Students will rotate a chair and PC and then COPY the entire set of furniture to other locations by completing drawing # 9-#14. • Self-Check: Making Changes to Your Drawing (4 questions) • Unit quiz • Observation of student work • Completion of drawings #9 - #14

Suggested Resources

- AutoCAD Desktop software
- Madsen, David; Shumaker, Terence. AutoCAD and its applications-Advanced. Tinley Park, Illinois: The Goodheart-Willcox Company, 2001.
- Supplemental worksheets
- Drawings #9 - #14

New Milford Public Schools

Committee Member(s): Joe Neff Unit 3: Review - Drawing Organization and Information	Course/Subject: Architectural Drafting III Grade Level: 11-12 # of Weeks: 2

Identify Desired Results

Common Core State Standards

- Use structured problem-solving methods when developing proposals and solutions. **EKS.05.06**
- Demonstrate flexibility and willingness to learn new knowledge and skills. **EKS.08.02**

Enduring Understandings Generalizations of desired understanding via essential questions (Students will understand that …)	Essential Questions Inquiry used to explore generalizations
• Students will be able to create new drawings with templates • Students will be able to use layers to organize their drawings • Students will be able to change the layer of an object • Students will be able to draw an arc ten different ways • Students will be able to draw polylines by using both width and length • Students will be able to convert polylines to lines and arcs • Students will be able to measure distances • Students will be able to measure areas • Students will have information about objects	• Why do we need different ways to draw arcs? • Why do we need polylines and how are they different from standard li9nes? • What does EXPLODE command do and why do we need it? • What is the difference between a layer that is frozen and a layer that is off? • Why would we want to move an existing object to a different layer?

Expected Performances
What students should know and be able to do

Students will know the following:
- How to create a new drawing with template
- How to make a layer current
- How to draw on specific layers
- How to control the state of a layer
- How to change the layer of an object
- Be able to draw arcs ten different ways
- Be able to draw polylines three different ways
- How to convert polylines to lines and arcs
- How to convert line and arcs to polylines

Students will be able to do the following:
- Use the dialog to select a template
- Set the current layer
- Change an object's layer
- Organize a drawing with layers
- Draw arcs
- Draw polylines
- Convert polylines to arcs and lines
- Convert arcs and lines to polylines

Character Attribute(s)

- Perseverance
- Respect

Technology Competencies

- Analyze the use of current CADD design technology. (CADD.02)

Develop Teaching and Learning Plan

Teaching Strategies:	Learning Activities:
- Teacher will lecture using the AutoCAD software showing the students the proper techniques for layering - Teacher will lecture on the proper commands used for drawing arcs, circles, and polylines - Teacher will use the data projector to summarize the various techniques used to complete the drawings assigned - Teacher will give the students exercises that demonstrate how to use the various commands - Students will together in small groups to show each other the proper commands needed to complete the assignments "EXIT TICKET." At the end of class hand out a sheet of paper with a single question about what they learned or did not learn in class. Collect it as they leave class and review it at the start of the next class. - Integrating Technology by using the computers to complete the assignments (drawings #15 - #20)	- Start drawings using different template files. - Change the state of layers using the icons in the toolbar. - Use the Layers toolbar and Match properties to move objects to different layers. - Draw door swings in a floor plan using the ARC command. - Construct several polylines as symbols to be used in a flow chart. - Edit polylines to join arcs and lines into a polyline and change the width. - Measure distances in a floor plan. - Find the areas of objects in a drawing. - Start a new drawing based on the MECH-INCHES DWG template.

Assessments

Performance Task(s) Authentic application to evaluate student achievement of desired results designed according to GRASPS (one per marking period)	Other Evidence Application that is functional in a classroom context to evaluate student achievement of desired results
Goal: Enable students to create a basic 2D drawing in AutoCAD **Role**: Instructor/Teacher **Audience**: Students in Architectural Drafting III classes **Situation**: Students are given drawings to complete that show the teacher they understand the basic command needed to complete the drawing **Product**: Correct completion of 2D drawings (#15 - #20) **Standards for Success**: Completion for drawing #15-#20 using departmental rubrics	• Start drawings using different template files by opening a new drawing, drawing #15. • Change the state of layers using the icons in the toolbar by completing drawing #16. • Use the Layers toolbar and Match properties to move objects to different layers by completing drawing #16. • Draw door swings in a floor plan using the ARC command by competing drawing #17. • Construct several polylines as symbols to be used in a flow chart by completing drawing #18 • Edit polylines to join arcs and lines into a polyline and change the width by completing drawing #18. • Measure distances in a floor plan by completing drawing #19. • Find the areas of objects in a drawing by completing drawing #20. • Start a new drawing based on the MECH-INCHES DWG template by completing drawing #20. • Self-Check – Getting Information from your Drawing (8 questions) • Unit quiz • Observation of student work • Completion of Drawings #15 - #20

Suggested Resources

- AutoCAD Desktop software
- Madsen, David; Shumaker, Terence. AutoCAD and its applications-Advanced. Tinley Park, Illinois: The Goodheart-Willcox Company, 2001.
- Supplemental worksheets
- Drawings #15 - #20

New Milford Public Schools

Committee Member(s): Joe Neff Unit 4: Review - Creating More Complex Objects	Course/Subject: Architectural Drafting III Grade Level: 11-12 # of Weeks: 2

Identify Desired Results

Common Core State Standards

- Identify positive work-qualities typically desired in each career. **EKS.08.07**
- Guide individuals through the process of recognizing concerns and making informed decisions. **EKS.09**

Enduring Understandings Generalizations of desired understanding via essential questions (Students will understand that …)	Essential Questions Inquiry used to explore generalizations
- Students will know when to use the following advanced editing commands: - Trim and Extend - Stretch - Fillet and Chamfer - Students will be able to use the following duplication commands: - Offsetting - Mirroring - Arrays - Students will know what c\blocks are and how to insert them from the tool palette and with the insert command	- Why is it important to use the MIRROR command? - What are the two types of arrays you can create and explain the difference between both? - Why do we need to know how to insert blocks from the tool palette? - What are some advantages of using blocks? - What are the three methods that can be used to specify the dimensions of a chamfer? - What do you need to set before you apply a fillet in your drawing?

Expected Performances
What students should know and be able to do

Students will know the following:
- How to trim and extend objects
- How to stretch objects
- Fillet and chamfer objects
- Offset objects
- Mirror objects
- How to create arrays of objects
- What blocks are
- How to insert blocks using the Tool Paletts window
- How to insert blocks with the INSERT command

Students will be able to do the following:
- Use the TRIM command
- Use the EXTEND and TRIM command to complete drawings

- Use the STRETCH command to increase the size of an object
- Use the FILLET command to round the outer corners of an object
- Use the CHAMFER commands to create angled corners on an object
- Use OFFSET to construct parallel or concentric objects
- Use MIRROR to duplicate the other half of an object
- Create an rectangular and polar ARRAY
- Insert a block from the tools paletts

Character Attribute(s)

- Cooperation
- Responsibility

Technology Competencies

- Identify, describe, and utilize the basic hardware and operating systems used in CADD
- Define and apply computer technology

Develop Teaching and Learning Plan

Teaching Strategies:	Learning Activities:
- Teacher will use the "COLD CALL technique. Using this technique, the teacher starts at computer #1 and asks that student a question about the command. Then continues to computer #2 and asks another question and so on until he asks all of the students a question about a command. If one student is having a problem, it is up to the next student in line to help answer the question. - Collaborative/Cooperative learning where the students work together to accomplish the goal of advanced editing techniques - Inquiry-Guided Learning helps students build research skills from what they have already learned - Teacher will use the data projector, if needed, to show the students how to use the advanced editing skills - Teacher will hand out drawings #21 - #25 to complete in class using the advanced editing techniques	- Students will use the TRIM and EXTEND command to complete a drawing. - Students will use the STRETCH command to increase the width of a drawing. - Students will use FILLET to round the outer corners of a part with two different radius sizes. - Students will use the CHAMFER command with several different distances to create angled edges on a part. - Students will use OFFSET on polylines, lines, and arcs to create walls and steps. Use rectangular and polar ARRAY to make copies of the workstation. - Students will add furniture blocks from the tools palettes window into a floor plan - Self Check: Creating Complex Objects (8 questions) - Unit quiz - Observation of student work - Completion of Drawings # 21 - #25

Assessments

| Performance Task(s)
Authentic application to evaluate student achievement of desired results designed according to GRASPS (one per marking period) | Other Evidence
Application that is functional in a classroom context to evaluate student achievement of desired results |
|---|---|
| **Goal**: Using drawing organization and information to create drawings that are more complex.

Role: Instructor/Teacher

Audience: Students in Architectural Drafting III classes

Situation: Students are given drawings to complete that show the teacher they understand the more complex commands needed to complete the drawings

Product: Correct completion of 2D drawings (#21 - #25)

Standards for Success: Completion for drawing #21-#25 using departmental rubrics | • Use the TRIM command by completing drawing #21.

• Use the TRIM and EXTEND command to complete a drawing by completing drawing #21.

• Use the STRETCH command to increase the width of a drawing by completing drawing #21.

• Use FILLET to round the outer corners of a part with two different radius sizes by completing drawing #22.

• Use the CHAMFER command with several different distances to create angled edges on a part by completing drawing #23.

• Use OFFSET on polylines, lines, and arcs to create walls and steps. Use rectangular and polar ARRAY to make copies of the workstation by completing drawing #24.

• You will add furniture blocks from the tools palettes window into a floor plan by completing drawing #25. |

Suggested Resources

- AutoCAD Desktop software
- Madsen, David; Shumaker, Terence. AutoCAD and its applications-Advanced. Tinley Park, Illinois: The Goodheart-Willcox Company, 2001.
- Supplemental worksheets
- Drawings #21 - #25

New Milford Public Schools

Committee Member(s): Joe Neff Unit 5: Review - Preparing to Print	Course/Subject: Architectural Drafting III Grade Level: 11-12 # of Weeks: 2

Identify Desired Results

Common Core State Standards

- Critically analyze information to determine value to the problem-solving task. **EKS.05.08**
- Employ critical thinking skills independently and in teams to solve problems and make decisions (e.g. analyze, synthesize and evaluate). **EKS.05**

Enduring Understandings Generalizations of desired understanding via essential questions (Students will understand that …)	**Essential Questions** Inquiry used to explore generalizations

• Setting Up a Layout involves the following steps:
    o Printing Concepts
    o Working in Layouts
    o Paper Space and Model Space
    o Creating and Scaling Viewports
    o Creating a New Layout
    o Copying a Layout
    o Guidelines for Layouts
• Printing Your Drawing includes the following:
    o PLOT command
    o Plot Settings
    o Plot Preview
	• How many different layouts are in AutoCAD?
	• Why do we need both Paper Space and Model Space?
	• What are the differences between working in Paper Space and Model Space?
	• How do you know what scale should you use in the Plot Scale area of the Plot Dialog box? Explain?
	• Are setting such as paper size and plot orientation saved with the drawing, saved with the layout, or not saved at all?
	• What are some key differences between plotting from the Model tab and plotting a layout?

Expected Performances
What students should know and be able to do

Students will know the following:
- How to switch between Paper Space and Model Space
- How to create viewports in a layout
- How to scale vewports
- How to manipulate viewports
- How to set up a new drawing
- How to copy a layout
- How to choose what to print or plot
- How to choose a plotter
- How to preview the printed drawing

Students will be able to do the following:
- Model space printing
- Paper space layout printing
- Working in layouts
- Switch between Paper Space and Model Space
- Create, scale and manipulate viewports
- Create and copy a layout
- Use the PLOT command
- Preview the PLOT

- Courage
- Cooperation

- Organize and provide a compact disc, web site and/or other digital media for use in demonstrating knowledge, skills, and experience.
- Define and apply computer technology.

Develop Teaching and Learning Plan

Teaching Strategies:
- Teacher will lecture on how to prepare to print.
- Teacher will lecture on layouts: paper space, model space, viewports, and settings.
- Teacher will give the students exercises that demonstrate how to use the various commands
- Teacher will explain how to do a print preview.
- Teacher will use the data projector to show the students how to print
- Critical Thinking-by completing the drawings (#26-#35) it will help the students understand the commands and help them to clarify what was taught.
- Active Learning-working on drawings, doing hands-on, which helps the student understand the information and develops critical thinking
- Teacher will hand out drawings #26 - #35 to complete in class using the advanced editing techniques

- Students will view the difference between Model Space and layouts
- Students will create, scale, and lock viewports in a layout.
- Students will create two new layouts: one based on an existing page setup, and another based on a new page setup that you define.
- Students will copy an existing layout and modify the copy.
- Students will plot a layout to a file.
- Students will be able to set up a drawing in a new layout. You will create and scale viewports and adjust the view in each viewport.

• Problem-Based Learning-by giving the students drawings to complete to show the teacher that they understand the commands.	

Assessments

Performance Task(s) Authentic application to evaluate student achievement of desired results designed according to GRASPS (one per marking period)	Other Evidence Application that is functional in a classroom context to evaluate student achievement of desired results
Goal: Enable students to create a basic 2D drawing in AutoCAD **Role**: Instructor/Teacher **Audience**: Students in Architectural Drafting III classes **Situation**: Students are given drawings to complete that show the teacher they understand the basic command needed to complete the drawing **Product**: Correct completion of 2D drawings (#26 - #35) **Standards for Success**: Completion for drawing #26-#35 using departmental rubrics	• Students will view the difference between Model Space and layouts • Students will create, scale, and lock viewports in a layout by completing drawings #26. • Students will create two new layouts: one based on an existing page setup, and another based on a new page setup that you define by completing drawing #27. • Students will copy an existing layout and modify the copy by completing drawing #28 . • Students will plot a layout to a file by completing a drawing #29. • Students will be able to set up a drawing in a new layout. You will create and scale viewports and adjust the view in each viewport by completing drawings #33 - #35. • Self-Check: How to Print Your Drawing (10 questions) • Unit quiz • Observation of student work • Completion of Drawings #26 - #35

Suggested Resources

- AutoCAD Desktop software
- Madsen, David; Shumaker, Terence. <u>AutoCAD and its applications-Advanced.</u> Tinley Park, Illinois: The Goodheart-Willcox Company, 2001.
- Supplemental worksheets
- Drawings #26 - #35

New Milford Public Schools

Committee Member(s): Joe Neff Unit 6: Introduction to 3D Drawing	Course/Subject: Architectural Drafting III Grade Level: 11-12 # of Weeks: 3

Identify Desired Results

Common Core State Standards

- Describe the value of using problem-solving and critical thinking skills to improve a situation or process. **EKS.05.03**
- Identify common tasks that require employees to use problem-solving skills. **EKS.05.01**
- Evaluate alternatives using a variety of problem-solving and critical thinking skills. **EKS.05.11**

Enduring Understandings Generalizations of desired understanding via essential questions (Students will understand that …)	**Essential Questions** Inquiry used to explore generalizations
- Students will know how to use rectangular 3D coordinates. - Students will know how to create extruded 3D shapes. - Students will know about The Right-Hand rule of 3D drawing. - Students will be able to display 3D drawings with the Viewport command. - Students will be able to construct wireframes and 3D faces. - Students will be able to construct 3D surface-Modeled objects.	- Why is it important to know how to use rectangular 3D coordinates? - What is the advantage to between 3D and 2D extruded shapes? - Why is the Right-Hand rule important to 3D construction? - Explain the importance of a Viewport? - Describe the steps to construct a 3D face. - What is a 3D surface-model and how is it used?

Expected Performances
What students should know and be able to do

Students will know the following:
- How to use a rectangle 3D coordinate
- How to create extruded 3D shapes
- How to use the Right-Hand rule
- Display 3D drawings with the Viewport command
- Construct wireframes and 3D faces
- Construct 3D surface-Modeled objects

Students will be able to do the following:
- Use rectangle 3D coordinate to draw an object
- Create an extruded 3D shape
- Use the Right-hand rule to create a drawing
- Display 3D drawings with Viewport command
- Construct 3D faces and Wireframes

• Construct 3D surface-Modeled objects

Character Attribute(s)
• Cooperation • Honesty

Technology Competencies
• Identify and demonstrate positive work behaviors and personal qualities needed to be employable • Demonstrate self-discipline, self-worth, positive attitude, and integrity in a work situation.

Develop Teaching and Learning Plan

Teaching Strategies:
- Divide the class into three groups. All groups will read Chapter #1, Introduction to 3D Drawing. One group shows the class "how to draw a rectangle and an extruded shape. Group #2 will explain "Right-Hand Rule and VPOINT". Group #3 – Wireframes and Surface Models. Each group will lecture to the rest of the class on their sections.
- Teacher uses the data projector to show each group's section to the rest of the class.
- Teacher will use the data projector, if needed, to show the students how to use the various commands in AutoCAD software.
- Teacher will give the students exercises that demonstrate how to use the various commands.
- Experiential Learning-this is the approach by which the students "learn by doing". Giving the students drawings to complete to show the teacher that they understand and can perform the software command.
- Teacher will integrate technology by having the students complete the drawing using the computer, the plotter and the AutoCAD software

Learning Activities:
- Students will draw an rectangular 3D shape
- Students will create an extruded 3D shape
- Students will display a 3D drawing using the Viewport command
- Students will construct a 3D face and Wireframe
- Students will construct a 3D Surface-Modeled object

Assessments

Performance Task(s) Authentic application to evaluate student achievement of desired results designed according to GRASPS (one per marking period)	Other Evidence Application that is functional in a classroom context to evaluate student achievement of desired results
Goal: Enable students to create a basic 3D drawing in AutoCAD **Role**: Instructor/Teacher **Audience**: Students in Architectural Drafting III classes **Situation**: Students are given drawings to complete that show the teacher they understand the basic command needed to complete the drawing **Product**: Correct completion of 3D drawings (#36 - #40) **Standards for Success**: Completion for drawing #36-#40 using departmental rubrics	• Students will draw an rectangular 3D shape by completing Drawing #36 • Students will create an extruded 3D shape by completing Drawing #37 • Students will display a 3D drawing using the Viewport command by completing Drawing #38 • Students will construct a 3D face and Wireframe by completing Drawing #39 • Students will construct a 3D Surface-Modeled object by completing Drawing #40 • Self-Check – Introduction to 3D drawings. (15 questions) • Unit quiz • Observation of student work • Completion of drawings #36 - #40

Suggested Resources

- AutoCAD Desktop software
- Madsen, David; Shumaker, Terence. AutoCAD and its applications-Advanced. Tinley Park, Illinois: The Goodheart-Willcox Company, 2001.
- Supplemental worksheets
- Drawings #36 - #40

New Milford Public Schools

Committee Member(s): Joe Neff Unit 7: 3D Coordinates & Construction	Course/Subject: Architectural Drafting III Grade Level: 11-12 # of Weeks: 3

Identify Desired Results

Common Core State Standards

- Analyze the use of current CADD design technology. **CADD.02**
- Utilize measurement and annotation systems as they apply to CADD technology design. **CADD.03**
- Describe the process for setting and manipulating drawing elements. **CADD.05.08**

Enduring Understandings Generalizations of desired understanding via essential questions (Students will understand that …)	Essential Questions Inquiry used to explore generalizations
- Students will know how to use 3D coordinate system. - Students will know how to create 3D surface models. - Students will know how to draw 3D constructions. - Students will be able to understand guidelines for working with 3D drawings.	- Why is it important to know how to use the 3D coordinate system? - Why is it important to know how to create 3D surface models? - Explain the importance of 3D constructions? - Name three guidelines for working with 3d drawings and what is the purpose for these guidelines?

Expected Performances
What students should know and be able to do

Students will know the following:
- How to use the 3D coordinate system.
- How to create 3D surface models
- How to draw 3D constructions
- Understand the proper guidelines for working with 3D drawings

Students will be able to do the following:
- Use the 3D coordinate system to draw an object
- Create an 3D surface model
- Draw 3D constructions
- Understand and use the guidelines for working with 3D drawings

Character Attribute(s)
- Perseverance
- Responsibility

Technology Competencies
• Guide individuals through the process of recognizing concerns and making informed decisions.
• Demonstrate self-discipline, self-worth, positive attitude, and integrity in a work situation.

Develop Teaching and Learning Plan

Teaching Strategies:	Learning Activities:
• "Take a Swing" technique. After reading Chapter #2 the teacher will ask a question to a student. If the student answers the question correctly, they hit a home run. If another student helps with the answer they hit a double. At the end of class, the student with the best total bases is the winner. • Teacher will use the data projector, if needed, to show the students how to use the various commands in AutoCAD software. • Teacher will demonstrate how to use the 3D commands. • Teacher will give the students exercises that demonstrate how to use the various commands. • Experiential Learning-this is the approach by which the students "learn by doing". Giving the students drawings to complete to show the teacher that they understand and can perform the software command. • Teacher will integrate technology by having the students complete the drawing using the computer, the plotter and the AutoCAD software	• Students will draw 3D shapes using 3D coordinates • Students will create 3D constructions • Students will create 3D models • Students will construct a 3D drawing using 3D guidelines

Assessments

Performance Task(s) Authentic application to evaluate student achievement of desired results designed according to GRASPS (one per marking period)	Other Evidence Application that is functional in a classroom context to evaluate student achievement of desired results
Goal: Enable students to create a basic 3D drawing in AutoCAD **Role**: Instructor/Teacher	• Students will draw 3D shapes by using 3D coordinates - Drawing #41-#43 • Students will create an 3D constructions - Drawing #44

Audience: Students in Architectural Drafting III classes **Situation**: Students are given drawings to complete that show the teacher they understand the basic command needed to complete the drawing **Product**: Correct completion of 3D drawings (#41 - #45) **Standards for Success**: Completion for drawing #41-#45 using departmental rubrics	• Students will display a 3D drawing using the guidelines - Drawing #45 • Self-Check – 3D Coordinates and Construction (15 questions) • Unit quiz • Observation of student work • Completion of drawings #41 - #45

Suggested Resources

- AutoCAD Desktop software
- Madsen, David; Shumaker, Terence. AutoCAD and its applications-Advanced. Tinley Park, Illinois: The Goodheart-Willcox Company, 2001.
- Supplemental worksheets
- Drawings #41 - #45

New Milford Public Schools

Committee Member(s): Joe Neff Unit 8: Understanding User Coordinates and Model Space Viewports	Course/Subject: Architectural Drafting III Grade Level: 11-12 # of Weeks: 2

Identify Desired Results

Common Core State Standards

- Utilize measurement and annotation systems as they apply to CADD technology design. **CADD.03**
- Use the concepts of geometric construction in the development of design drawings. **CADD.05.04**

Enduring Understandings Generalizations of desired understanding via essential questions (Students will understand that …)	Essential Questions Inquiry used to explore generalizations
- Students will know how to use the User Coordinate System. - Students will be able to work with UCS basics. - Students will understand Viewports. - Students will know how to create a Viewport - Students will be able to display a Vieport in multiple drawings	- Why is it important to know how to use the User Coordinate System? What are the main factors? - What is the advantage of working in a User Coordinate System? - What is a Viewport? - How do you create a Viewport? Explain.

Expected Performances
What students should know and be able to do

Students will know the following:
- How to create a drawing using the User Coordinate System
- How to able to work with UCS basics
- Understand what a Viewport is and how it is used
- Be able to create a Viewport
- Be able to create a viewport in multiple drawings

Students will be able to do the following:
- Use the User Coordinate System
- Use UCS basics
- Be able to change UCS coordinates
- Create Viewports
- Draw different types of multiples

Character Attribute(s)

- Honesty
- Respect

Technology Competencies
• Identify and demonstrate positive work behaviors and personal qualities needed to be employable • Demonstrate self-discipline, self-worth, positive attitude, and integrity in a work situation.

Develop Teaching and Learning Plan

Teaching Strategies:	Learning Activities:

• Teacher will lecture on the different ways to start a 3D drawings including:
   o Using UCS coordinates
   o Ways of changing UCS
   o Using UCS basics
   o What are Viewports
   o Ways of creating Viewports
   o Drawing Multiples
• Teacher will use the data projector to show the students how to use the various commands in AutoCAD software.
• Teacher will demonstrate how to use the 3D commands.
• Teacher will give the students exercises that demonstrate how to use the various commands.
• Experiential Learning-this is the approach by which the students "learn by doing". Giving the students drawings to complete to show the teacher that they understand and can perform the software command.
• Teacher will integrate technology by having the students complete the drawing using the computer, the plotter and the AutoCAD software
	• Students will create a drawing using the User Coordinate System
	• Students will create an 3D shape and then change the UCS
	• Students will display a 3D drawing using the UCS basics
	• Students will construct a 3D drawings by creating a multiple Viewport

Assessments

Performance Task(s) Authentic application to evaluate student achievement of desired results designed according to GRASPS (one per marking period)	Other Evidence Application that is functional in a classroom context to evaluate student achievement of desired results
Goal: Enable students to create a basic 3D drawing in AutoCAD **Role**: Instructor/Teacher **Audience**: Students in Architectural Drafting III classes **Situation**: Students are given drawings to complete that show the teacher they understand the basic command needed to complete the drawing **Product**: Correct completion of 3D drawings (#46 - #49) **Standards for Success**: Completion for drawing #46-#49 using departmental rubrics	• Students will create a drawing using the User Coordinate System. Drawing #46 • Students will create a 3D shape and then change the UCS. Drawing #47 • Students will display a 3D drawing using the UCS basics. Drawing #48 • Students will construct a 3D drawing by creating a multiple Viewport. Drawing #49 • Self-Check – Understanding User Coordinates and Viewports (15 questions) • Unit quiz • Observation of student work • Completion of drawings #46 - #49

Suggested Resources

- AutoCAD Desktop software
- Madsen, David; Shumaker, Terence. AutoCAD and its applications-Advanced. Tinley Park, Illinois: The Goodheart-Willcox Company, 2001.
- Supplemental worksheet
- Drawings #46 - #49

New Milford Public Schools

Committee Member(s): Joe Neff Unit 9: 3D Surface Modeling Techniques and Editing	Course/Subject: Architectural Drafting III Grade Level: 11-12 # of Weeks: 3

<table>
<tr><td colspan="2" align="center">Identify Desired Results</td></tr>
<tr><td colspan="2" align="center">Common Core State Standards</td></tr>
<tr><td colspan="2">

- Express a design of a 3D model. **CADD.02.07**
- Identify various symbols to interpret and read technical drawings **CADD.09**

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<tr>
<td align="center">Enduring Understandings
Generalizations of desired understanding via essential questions
(Students will understand that …)</td>
<td align="center">Essential Questions
Inquiry used to explore generalizations</td>
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<tr>
<td>

- Students will know how to draw 3D meshes.
- Students will know how to surface around holes.
- Students will know how to construct a Surface Model.
- Students will understand how to change properties
- Students will know how to use Grips to edit 3D objects.
- Students will be able to align 3D objects.
- Students will be able to rotate 3D objects.

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- Why is it important to know how to draw a mesh? What is the purpose?
- Explain the steps used to draw a surface around a hole.
- Name some to properties used in 3D modeling?
- Why is it important to be able to rotate and align 3D objects?
- Explain Grips.

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<tr><td colspan="2" align="center">Expected Performances
What students should know and be able to do</td></tr>
<tr><td colspan="2">

Students will know the following:
- How to create a 3D meshes
- How to surface around holes
- How to create a surface model
- Be able to change properties
- Use Grips to edit 3D objects
- Align 3d Objects
- Be able to rotate 3D objects

Students will be able to do the following:
- Create all of the different types of meshes
- Draw a surface around a hole
- Construct a Surface model
- Change properties
- Use Grips to edit 3D objects
- Align and rotate 3D objects

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Character Attribute(s)
• Courage • Perseverance

Technology Competencies
• Identify and demonstrate positive work behaviors and personal qualities needed to be employable • Demonstrate self-discipline, self-worth, positive attitude, and integrity in a work situation.

Develop Teaching and Learning Plan

Teaching Strategies:	Learning Activities:

• Teacher will lecture on the different ways to edit 3D drawings including:
  o 3D Mesh techniques
  o Surfacing around a hole
  o Construct a Surface Model
  o Change properties
  o Use Grips to edit objects
  o Teacher will use the data projector to show the students how to use the various commands in AutoCAD software.
• After the teacher lecture, each student will pick a command and using the teacher's computer and the data projector, demonstrate to the class the proper modeling and editing techniques.
• Teacher will give the students exercises that demonstrate how to use the various commands.
• Experiential Learning-this is the approach by which the students "learn by doing". Giving the students drawings to complete to show the teacher that they understand and can perform the software command.
• Teacher will integrate technology by having the students complete the drawing using the computer, the plotter and the AutoCAD software
	• Students will draw three different mesh designs Drawing #50
	• Students will create a surface model and create a surface around a hole Drawing #51
	• Students will draw a 3D object and change the properties Drawing #52
	• Students will construct a 3D object and align and rotate the object. Drawing #53

Assessments

Performance Task(s) Authentic application to evaluate student achievement of desired results designed according to GRASPS (one per marking period)	Other Evidence Application that is functional in a classroom context to evaluate student achievement of desired results
Goal: Enable students to create a basic 3D drawing in AutoCAD **Role**: Instructor/Teacher **Audience**: Students in Architectural Drafting III classes **Situation**: Students are given drawings to complete that show the teacher they understand the basic command needed to complete the drawing **Product**: Correct completion of 3D drawings (#50 - #53) **Standards for Success**: Completion for drawing #50-#53 using departmental rubrics	• Students will draw three different meshes Drawing #50 • Students will create a surface model and then draw a surface around a hole Drawing #51 • Students will display a 3D drawing and then change the properties Drawing #52 • Students will construct a 3D object and then align and rotate the object Drawing #53 • Self-Check – Modeling Techniques (15 questions) • Unit quiz • Observation of student work • Completion of drawings #50 - #53

Suggested Resources

- AutoCAD Desktop software
- Madsen, David; Shumaker, Terence. AutoCAD and its applications-Advanced. Tinley Park, Illinois: The Goodheart-Willcox Company, 2001.
- Supplemental worksheets
- Drawings #50 - #53

New Milford Public Schools

Committee Member(s): Joe Neff Unit 10: Viewing and Displaying 3D Models	Course/Subject: Architectural Drafting III Grade Level: 11-12 # of Weeks: 2

Identify Desired Results
Common Core State Standards

- Express a design of a 3D model. **CADD.02.07**
- Identify various symbols to interpret and read technical drawings **CADD.09**

Enduring Understandings Generalizations of desired understanding via essential questions (Students will understand that …)	**Essential Questions** Inquiry used to explore generalizations
• Students will know how to use the VPOINT command. • Students will know how to view Models Dynamically. • Students will know how to use the DVIEW command. • Students will understand how to create a Standard Engineering Layout. • Students will know how to use display a 3D model	• Why is it important to know how to use the VPOINT command? What is the purpose? • Explain the steps used to view Models dynamically. • Name some properties used in 3d modeling? • Why is it important to be able to use the Standard Engineering layout?

Expected Performances What students should know and be able to do

Students will know the following:
- How to use the VPOINT command
- How to view Models dynamically
- How to use the DVIEW command
- Be able to understand the Standard Engineering Layout
- Be able to display a 3D object

Students will be able to do the following:
- Create a drawing using the VPOINT command
- View Models dynamically
- Construct a model using the Standard Engineering Layout.
- Display a 3D model

Character Attribute(s)

- Cooperation
- Perseverance

- Identify and demonstrate positive work behaviors and personal qualities needed to be employable
- Demonstrate self-discipline, self-worth, positive attitude, and integrity in a work situation.

Develop Teaching and Learning Plan

Teaching Strategies:

- Divide the class into three groups. All groups will read Chapter #7, Introduction to 3D Drawing. One group shows the class "how to use the "VPOINT" command. Group #2 will explain "DVIEW" command. Group #3 – 3D Models. Each group will lecture to the rest of the class on their sections.
- Teacher uses the data projector to show each group's section to the rest of the class.
- Teacher will give the students exercises that demonstrate how to use the various commands.
- Experiential Learning-this is the approach by which the students "learn by doing". Giving the students drawings to complete to show the teacher that they understand and can perform the software command.
- Teacher will integrate technology by having the students complete the drawing using the computer, the plotter and the AutoCAD software

Learning Activities:

- Students will draw an object using VPOINT technique Drawing #54
- Students will create a dynamically viewed model Drawing #55
- Students will draw a 3D object using the Standard Engineering Layout Drawing #56

Assessments

Performance Task(s) Authentic application to evaluate student achievement of desired results designed according to GRASPS (one per marking period)	Other Evidence Application that is functional in a classroom context to evaluate student achievement of desired results
Goal: Enable students to create a basic 3D drawing in AutoCAD **Role**: Instructor/Teacher **Audience**: Students in Architectural Drafting III classes **Situation**: Students are given drawings to complete that show the teacher they understand the basic command needed to complete the drawing **Product**: Correct completion of 3D drawings (#54 - #56) **Standards for Success**: Completion for drawing #54-#56 using departmental rubrics	• Students will draw an object using the VPOINT command Drawing #54 • Students will create a dynamically viewed surface model Drawing #55 • Students will display a 3D drawing using the Standard Engineering Layout Drawing #56 • Self-Check – Viewing and Displaying 3D Models (15 questions) • Unit quiz • Observation of student work • Completion of drawings #54 - #56

Suggested Resources

- AutoCAD Desktop software
- Madsen, David; Shumaker, Terence. <u>AutoCAD and its applications-Advanced.</u> Tinley Park, Illinois: The Goodheart-Willcox Company, 2001.
- Supplemental worksheets
- Drawings #54 - #56

New Milford Public Schools

Committee Member(s): Joe Neff Unit 11: 3D Text and Dimensioning	Course/Subject: Architectural Drafting III Grade Level: 11-12 # of Weeks: 2

Identify Desired Results
Common Core State Standards

- Express a design of a 3D model. **CADD.02.07**
- Identify various symbols to interpret and read technical drawings **CADD.09**

Enduring Understandings Generalizations of desired understanding via essential questions (Students will understand that …)	**Essential Questions** Inquiry used to explore generalizations
- Students will know how to create 3D text. - Students will know how to create 3D text with thickness. - Students will know how dimension in 3D.	- Why is it important to know how to dimension in 3D? - Explain how to change the thickness of your text. - Explain the steps used to dimension in 3D.

Expected Performances What students should know and be able to do

Students will know the following:
- How to create text in 3D
- How to change the thickness of 3D text
- How to dimension in 3D

Students will be able to do the following:
- Create a drawing and use 3D text
- Change the thickness of your 3D text
- Dimension a 3D drawing

Character Attribute(s)

- Integrity
- Respect

Technology Competencies

- Employ critical thinking skills to solve problems and make decisions
- Evaluate alternatives using a variety of problem-solving and critical thinking skills.

Develop Teaching and Learning Plan

Teaching Strategies:	Learning Activities:
- Teacher will lecture on the different ways to text and dimension 3D drawings. - Teacher will demonstrate how to use the 3D commands. - Teacher will give the students exercises that demonstrate how to use the various commands. - Experiential Learning-this is the approach by which the students "learn by doing". Giving the students drawings to complete to show the teacher that they understand and can perform the software command. - Teacher will integrate technology by having the students complete the drawing using the computer, the plotter and the AutoCAD software	- Students will draw an 3D object and be able to add text Drawing #57 - Students will create a 3D object, add text, then change the thickness of the text Drawing #58 - Students will draw a 3D object and then dimension. Drawing #59

Assessments

Performance Task(s) Authentic application to evaluate student achievement of desired results designed according to GRASPS (one per marking period)	Other Evidence Application that is functional in a classroom context to evaluate student achievement of desired results
Goal: Enable students to create a basic 3D drawing in AutoCAD **Role**: Instructor/Teacher **Audience**: Students in Architectural Drafting III classes **Situation**: Students are given drawings to complete that show the teacher they understand the basic command needed to complete the drawing **Product**: Correct completion of 3D drawings (#57 - #59) **Standards for Success**: Completion for drawing #57-#59 using departmental rubrics	- Students will draw an 3D object, and then add text Drawing #57 - Students will create a 3D drawing add text, then change the thickness of the text Drawing #58 - Students will create a 3D drawing and then dimension it. Drawing #59 - Self-Check – 3D Text and Dimensioning (15 questions) - Unit quiz - Observation of student work - Completion of drawings #57 - #59

Suggested Resources
• AutoCAD Desktop software
• Madsen, David; Shumaker, Terence. <u>AutoCAD and its applications-Advanced.</u> Tinley Park, Illinois: The Goodheart-Willcox Company, 2001.
• Supplemental worksheets
• Drawings #57 - #59

New Milford Public Schools

Committee Member(s): Joe Neff Unit 12: Introduction to Shading and Rendering	Course/Subject: Architectural Drafting III Grade Level: 11-12 # of Weeks: 3

Identify Desired Results

Common Core State Standards

- Demonstrate flexibility and willingness to learn new knowledge and skills. **EKS.08.02**
- Identify various symbols to interpret and read technical drawings **CADD.09**

Enduring Understandings Generalizations of desired understanding via essential questions (Students will understand that …)	Essential Questions Inquiry used to explore generalizations
• Students will know how to Shade a model. • Students will know how to render a model.	• Why is it important to know how to shade in 3D? • Explain how to render your drawing.

Expected Performances
What students should know and be able to do

Students will know the following:
- How to render a drawing in 3D
- How to shade a drawing in 3D

Students will be able to do the following:
- Shade a drawing in 3D
- Render a drawing in 3D

Character Attribute(s)

- Courage
- Cooperation

Technology Competencies

- Employ critical thinking skills to solve problems and make decisions
- Evaluate alternatives using a variety of problem-solving and critical thinking skills.

Develop Teaching and Learning Plan

Teaching Strategies:	Learning Activities:
• Divide the class into three groups. All groups will read Chapter #10, Introduction to Solid Modeling. One group shows the class "how to work with Regions. Group #2 will explain how to construct Solid Primitives. Group #3 – create Composite Solids. Each group will lecture to	• Students will draw an 3D object and be able to shade the object Drawing #60 • Students will create a 3D object, then render Drawing #61

- the rest of the class on their sections.
- Teacher uses the data projector to show each group's section to the rest of the class.
- Teacher will lecture on the different ways to shade and render 3D drawings.
- Teacher will demonstrate how to use the 3D commands.
- Teacher will give the students exercises that demonstrate how to use the various commands.
- Experiential Learning-this is the approach by which the students "learn by doing". Giving the students drawings to complete to show the teacher that they understand and can perform the software command.
- Teacher will integrate technology by having the students complete the drawing using the computer, the plotter and the AutoCAD software

Assessments

Performance Task(s) Authentic application to evaluate student achievement of desired results designed according to GRASPS (one per marking period)	Other Evidence Application that is functional in a classroom context to evaluate student achievement of desired results
Goal: Enable students to create a basic 3D drawing in AutoCAD **Role**: Instructor/Teacher **Audience**: Students in Architectural Drafting III classes **Situation**: Students are given drawings to complete that show the teacher they understand the basic command needed to complete the drawing **Product**: Correct completion of 3D drawings (#60 & #61) **Standards for Success**: Completion for drawing #60 & #61 using departmental rubrics	• Students will draw a 3D object, and then shade it. Drawing #60 • Students will create a 3D drawing then render it. Drawing #61 • Self-Check – Introduction to Shading and Rendering (15 questions) • Unit quiz • Observation of student work • Completion of drawings #60 & #61

Suggested Resources
• AutoCAD Desktop software
• Madsen, David; Shumaker, Terence. <u>AutoCAD and its applications-Advanced.</u> Tinley Park, Illinois: The Goodheart-Willcox Company, 2001.
• Supplemental worksheets
• Drawings #60 & #61

New Milford Public Schools

Committee Member(s): Joe Neff Unit 13: Introduction to Solid Modeling	Course/Subject: Architectural Drafting III Grade Level: 11-12 # of Weeks: 3

Identify Desired Results	
Common Core State Standards	
• Analyze elements of a problem to develop creative solutions. **EKS.05.02** • Identify various symbols to interpret and read technical drawings **CADD.09**	

Enduring Understandings Generalizations of desired understanding via essential questions (Students will understand that …)	**Essential Questions** Inquiry used to explore generalizations
• Students will know how to work with Regions. • Students will know how to construct Solid Primitives. • Students will be to create Composite Solids.	• Why is it important to know what a Region is? • Explain how to construct Solid Primitives. • Explain how to create a Composite Solid.

Expected Performances What students should know and be able to do
Students will know the following: • How to work with Regions in 3D • How to construct Solid Primitives in 3D • Create Composite Solids in 3D. Students will be able to do the following: • Develop a Region in 3D • Construct Solid Primitives in 3D • Create Composite Solids in 3D

Character Attribute(s)
• Cooperation • Perseverance

Technology Competencies
• Employ critical thinking skills to solve problems and make decisions • Evaluate alternatives using a variety of problem-solving and critical thinking skills.

Develop Teaching and Learning Plan	
Teaching Strategies: • Teacher will lecture on the ways to work with Regions. • Teacher will demonstrate how to use the 3D commands.	Learning Activities: • Students will draw a 3D object and add Regions. Drawing #62 • Students will create a 3D object, and then construct a Solid Primitive. Drawing #63

• Teacher will give the students exercises that demonstrate how to use the various commands. • Experiential Learning-this is the approach by which the students "learn by doing". Giving the students drawings to complete to show the teacher that they understand and can perform the software command. • Teacher will integrate technology by having the students complete the drawing using the computer, the plotter and the AutoCAD software	• Students will create a Composite Solid in 3D. Drawing #64

Assessments

Performance Task(s) Authentic application to evaluate student achievement of desired results designed according to GRASPS (one per marking period)	Other Evidence Application that is functional in a classroom context to evaluate student achievement of desired results
Goal: Enable students to create a basic 3D drawing in AutoCAD **Role**: Instructor/Teacher **Audience**: Students in Architectural Drafting III classes **Situation**: Students are given drawings to complete that show the teacher they understand the basic command needed to complete the drawing **Product**: Correct completion of 3D drawings (#62 - #64) **Standards for Success**: Completion for drawing #62 - #64 using departmental rubrics	• Students will draw a 3D object, and then add Regions. Drawing #62 • Students will create a 3D drawing then construct a Solid Primitive. Drawing #63 • Students will draw a 3D drawing and then create a Composite Solid. Drawing #64 • Self-Check – Introduction to Solid Modeling (15 questions) • Unit quiz • Observation of student work • Completion of drawings #62 - #64

Suggested Resources

- AutoCAD Desktop software
- Madsen, David; Shumaker, Terence. <u>AutoCAD and its applications-Advanced.</u> Tinley Park, Illinois: The Goodheart-Willcox Company, 2001.
- Supplemental worksheets
- Drawings #62 - #64

New Milford Public Schools

Committee Member(s): Joe Neff Unit 14: Solid Model Construction and Features	Course/Subject: Architectural Drafting III Grade Level: 11-12 # of Weeks: 3

Identify Desired Results

Common Core State Standards

- Analyze elements of a problem to develop creative solutions. **EKS.05.02**
- Create assemblies and views in 3D format. **CADD.07**

Enduring Understandings Generalizations of desired understanding via essential questions (Students will understand that …)	Essential Questions Inquiry used to explore generalizations
• Students will know how to create Solid Extrusion. • Students will know how to create Revolved Solids. • Students will know how to fillet Solid Objects. • Students will know how to Chamfer Solids. • Student will be able to Construct Solid Details and Features.	• Why is it important to know what a Solid Extrusion is? • Explain how to create a Revolved Solid. • What is a fillet and how do you create one on a Solid object? • Explain how to chamfer a solid object in 3D. • Give some examples of Solid Details and Features.

Expected Performances
What students should know and be able to do

Students will know the following:
- How to create Solid Extrusions
- How to construct a Revolved Solid
- Create a fillet on a 3D Solid object
- Create a chamfer on a 3D solid object
- Be able to construct Solid Details and Features

Students will be able to do the following:
- Create Solid Extrusions
- Construct a Revolved Solid
- Create a fillet on a Solid object
- Create a chamfer on a Solid object
- Construct Solid Details and Features on 3D Solid objects

Character Attribute(s)

- Respect
- Honesty

Technology Competencies
• Employ critical thinking skills to solve problems and make decisions
• Evaluate alternatives using a variety of problem-solving and critical thinking skills.

Develop Teaching and Learning Plan

Teaching Strategies:	Learning Activities:
• "Take a Swing" technique. After reading Chapter #11 the teacher will ask a question to a student. If the student answers the question correctly, they hit a home run. If another student helps with the answer they hit a double. At the end of class, the student with the best total bases is the winner. • Teacher will give the students exercises that demonstrate how to use the various commands. • Experiential Learning-this is the approach by which the students "learn by doing". Giving the students drawings to complete to show the teacher that they understand and can perform the software command. • Teacher will integrate technology by having the students complete the drawing using the computer, the plotter and the AutoCAD software	• Students will draw a 3D object and create a Solid Extrusion. Drawing #65 • Students will create a 3D Solid object, and then revolve the drawing. Drawing #66 • Students will create a fillet on a Solid 3D. Drawing #67 • Students will create a chamfer on a Solid 3D drawing. Drawing #68 • Students will construct a 3D Solid drawing and change its Features. Drawing #69

Assessments

Performance Task(s) Authentic application to evaluate student achievement of desired results designed according to GRASPS (one per marking period)	Other Evidence Application that is functional in a classroom context to evaluate student achievement of desired results
Goal: Enable students to create a basic 3D drawing in AutoCAD **Role**: Instructor/Teacher **Audience**: Students in Architectural Drafting III classes **Situation**: Students are given drawings to complete that show the teacher they understand the basic command needed to complete the drawing **Product**: Correct completion of 3D	• Students will draw a 3D object and create a Solid Extrusion. Drawing #65 • Students will create a 3D Solid object, and then revolve the drawing. Drawing #66 • Students will create a fillet on a Solid 3D. Drawing #67 • Students will create a chamfer on a Solid 3D drawing. Drawing #68 • Students will construct a 3D Solid drawing and change its Features. Drawing #69 • Self-Check – Solid Model

drawings (#65 - #69) **Standards for Success**: Completion for drawing #65 - #69 using departmental rubrics	Construction and Features (15 questions) • Unit quiz • Observation of student work • Completion of drawings #65 - #69

Suggested Resources
• AutoCAD Desktop software • Madsen, David; Shumaker, Terence. <u>AutoCAD and its applications-Advanced.</u> Tinley Park, Illinois: The Goodheart-Willcox Company, 2001. • Supplemental worksheets • Drawings #65 - #69

New Milford Public Schools

Committee Member(s): Joe Neff Unit 15: Solid Model Editing	Course/Subject: Architectural Drafting III Grade Level: 11-12 # of Weeks: 3

Identify Desired Results

Common Core State Standards

- Analyze elements of a problem to develop creative solutions. **EKS.05.02**
- Create assemblies and views in 3D format. **CADD.07**

Enduring Understandings Generalizations of desired understanding via essential questions (Students will understand that …)	Essential Questions Inquiry used to explore generalizations
• Students will know an overview of Solid Model Editing. • Students will know how to edit Faces. • Students will know how to edit Edges • Students will know how to edit Bodies. • Student will be able to construct a model with SOLIDEDIT.	• Why is it important to know how to edit Solid Models? • Explain how to edit Faces in 3D. • Explain how to edit Edges. • Explain how to edit Bodies in 3D. • What does SOLIDEDIT do?

Expected Performances
What students should know and be able to do

Students will know the following:
- How to edit Faces
- How to edit Edges
- How to edit Bodies
- Use SOLIDEDIT

Students will be able to do the following:
- Edit Faces
- Edit Edges
- Edit Bodies
- Use SOLIDEDIT

Character Attribute(s)

- Compassion
- Integrity

Technology Competencies

- Employ critical thinking skills to solve problems and make decisions
- Evaluate alternatives using a variety of problem-solving and critical thinking skills.

Develop Teaching and Learning Plan

Teaching Strategies:	Learning Activities:
- Teacher will lecture on the ways to edit Solid Models in 3D - After the teacher lecture, each student will pick a command and using the teacher's computer and the data projector, demonstrate to the class the proper editing command. - Teacher will give the students exercises that demonstrate how to use the various commands. - Experiential Learning-this is the approach by which the students "learn by doing". Giving the students drawings to complete to show the teacher that they understand and can perform the software command. - Teacher will integrate technology by having the students complete the drawing using the computer, the plotter and the AutoCAD software	- Students will draw a 3D object and edit the Face. Drawing #70 - Students will create a 3D object, and then edit the Edge. Drawing #71 - Students will edit a Body on a Solid 3D. Drawing #72 - Students will create a Solid 3D drawing using SOLIDEDIT. Drawing #73

Assessments

Performance Task(s) Authentic application to evaluate student achievement of desired results designed according to GRASPS (one per marking period)	Other Evidence Application that is functional in a classroom context to evaluate student achievement of desired results
Goal: Enable students to create a basic 3D drawing in AutoCAD **Role**: Instructor/Teacher **Audience**: Students in Architectural Drafting III classes **Situation**: Students are given drawings to complete that show the teacher they understand the basic command needed to complete the drawing **Product**: Correct completion of 3D drawings (#70 - #73) **Standards for Success**: Completion for drawing #70 - #73 using departmental rubrics	- Students will create a 3D object, and then edit the Edge. Drawing #71 - Students will edit a Body on a Solid 3D. Drawing #72 - Students will create a Solid 3D drawing using SOLIDEDIT. Drawing #73 - Self-Check – Solid Modeling Editing (15 questions) - Unit quiz - Observation of student work - Completion of drawings #70 - #73

Suggested Resources
• AutoCAD Desktop software • Madsen, David; Shumaker, Terence. <u>AutoCAD and its applications-Advanced.</u> Tinley Park, Illinois: The Goodheart-Willcox Company, 2001. • Supplemental worksheets • Drawings #70 - #73

New Milford Public Schools

Committee Member(s): Joe Neff Unit 16: Solid Model Display and Analysis	Course/Subject: Architectural Drafting III Grade Level: 11-12 # of Weeks: 3

Identify Desired Results

Common Core State Standards

- Analyze elements of a problem to develop creative solutions. **EKS.05.02**
- Create assemblies and views in 3D format. **CADD.07**

Enduring Understandings Generalizations of desired understanding via essential questions (Students will understand that …)	Essential Questions Inquiry used to explore generalizations
- Students will know to Control Solid Model Display. - Students will know how to view 3D model Internal Features. - Students will know how to create and use Multiview Layouts - Students will know Solid Model Analysis. - Student will be able to exchange Solid Model Files.	- What are some examples of Solid Model Control Displays? - Explain some 3D model Internal Features. - Explain how to use Muliview Layouts. - Explain what Solid Model Analysis does? - Explain how to exchange Solid Model Files.

Expected Performances
What students should know and be able to do

Students will know the following:
- How to control Solid Model Displays
- How to view 3D Model Internal Features
- How to create and use Multiview Layouts
- Understand Solid Model Analysis
- How to exchange Solid Model Files

Students will be able to do the following:
- Use Solid Modeling Displays
- View Internal Features
- Create and use Multiview Layouts
- Understand Solid Model Analysis
- Exchange Solid Model Files

Character Attribute(s)

- Cooperation
- Courage

Technology Competencies
• Employ critical thinking skills to solve problems and make decisions
• Evaluate alternatives using a variety of problem-solving and critical thinking skills.

Develop Teaching and Learning Plan

Teaching Strategies:	Learning Activities:
• "Take a Swing" technique. After reading Chapter #13, the teacher will ask a question to a student. If the student answers the question correctly, they hit a home run. If another student helps with the answer they hit a double. At the end of class, the student with the best total bases is the winner. • Teacher will demonstrate how to use the 3D commands. • Teacher will give the students exercises that demonstrate how to use the various commands. • Experiential Learning-this is the approach by which the students "learn by doing". Giving the students drawings to complete to show the teacher that they understand and can perform the software command. • Teacher will integrate technology by having the students complete the drawing using the computer, the plotter and the AutoCAD software	• Students will draw a 3D object. Drawing #74 • Students will view 3D Model Internal Features on drawing #74. • Students will create a 3D drawing. Drawing #75 • Students will use Multiview layouts on drawing #75 • Students will use the 3D Model File Exchange on drawing #75.

Assessments

Performance Task(s) Authentic application to evaluate student achievement of desired results designed according to GRASPS (one per marking period)	Other Evidence Application that is functional in a classroom context to evaluate student achievement of desired results
Goal: Enable students to create a basic 3D drawing in AutoCAD **Role**: Instructor/Teacher **Audience**: Students in Architectural Drafting III classes **Situation**: Students are given drawings to complete that show the teacher they understand the basic command needed to complete the drawing	• Students will draw a 3D object. Drawing #74 • Students will view 3D Model Internal Features on drawing #74. • Students will create a 3D drawing. Drawing #75 • Students will use Multiview layouts on drawing #75 • Students will use the 3D Model File Exchange on drawing #75. • Self-Check – Solid Modeling Display

	and Analysis (15 questions)
Product: Correct completion of 3D drawings (#74 &#75) **Standards for Success**: Completion for drawing #74 & #75 using departmental rubrics	• Unit quiz • Observation of student work • Completion of drawings #74 & #75

Suggested Resources
• AutoCAD Desktop software • Madsen, David; Shumaker, Terence. <u>AutoCAD and its applications-Advanced.</u> Tinley Park, Illinois: The Goodheart-Willcox Company, 2001. • Supplemental worksheets • Drawings #74 & #75