

# COMPUTER AIDED DESIGN/DRAFTING

**Curriculum Standard One:** The student will employ a variety of commands to draw and erase lines and simple geometric shapes on the screen. The student will make use of available drawing aids like Grid, Snap, and Object Snap to increase the accuracy of the drawing.

Performance Objective	Critical Attributes	Benchmarks/Assessment
<ol style="list-style-type: none"> <li>1. The student will learn at least two different methods of point entry to draw lines.</li> <li>2. The student will accurately draw circles and arcs employing the full range of options available under each of those commands.</li> <li>3. The student will understand the use of grid and snap as drawing aids.</li> </ol>	<ol style="list-style-type: none"> <li>A. Can the student select the best method of point entry for the task at hand and draw lines accurately?</li> <li>A. Can the student select the best circle and arc options for the task at hand and draw circles and arcs accurately?</li> <li>A. Can the student establish appropriate grid and snap settings for the task at hand and use them to create accurate lines, circles, and arcs?</li> </ol>	<ul style="list-style-type: none"> <li>• The student will draw lines of specified length and direction using the mouse and absolute, relative, and polar coordinate systems to enter points.</li> <li>• The student will draw several sized and located circles accurately. The student will draw several arcs, using a different arc creation option for each.</li> <li>• The student will use grid and snap aids to draw a series of specified lines, circles, and arcs.</li> </ul>

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**Curriculum Standard Two: The student will demonstrate familiarity with the AutoCAD screen, menus, toolboxes, function keys, and dialogue boxes. The student will demonstrate proficiency at setting up a new drawing project.**

Performance Objective	Critical Attributes	Benchmarks/Assessment
<ol style="list-style-type: none"> <li>1. The student will be able to identify and interact with the various aspects of the AutoCAD screen and the command structure.</li> <li>2. The student will understand how to adjust Limits and Units settings to begin a particular project.</li> <li>3. The student will be able to save his/her project to appropriate destinations on his/her computer.</li> <li>4. The student will understand the use of object snap tools as aids in drawing accuracy. The student will make use of object snap tools in the creation of a variety of simple geometric shapes.</li> </ol>	<ol style="list-style-type: none"> <li>A. Can the student identify and describe the purpose of different parts of the AutoCAD screen?</li> <li>A. Can the student access the Units and Limits commands and make appropriate settings for a project?</li> <li>A. Can the student save his/her work?</li> <li>A. Can the student select the appropriate object snap tools for the task at hand and employ them effectively in the creation of simple geometric shapes?</li> </ol>	<ul style="list-style-type: none"> <li>• The student will identify the various parts of the AutoCAD screen.</li> <li>• The student will use function keys, pull-down menus, toolboxes, and dialogue boxes to issue commands in the correct manner.</li> <li>• The student will set appropriate Units and Limits for mechanical, architectural, and civil drawing projects.</li> <li>• The student will save his/her work to both built-in and portable storage disks.</li> <li>• The student will draw a variety of simple geometric shapes using appropriate object snap tools to increase accuracy and efficiency.</li> </ul>

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<p><b>Curriculum Standard Three: The student will understand and make effective use of the variety of display options available in AutoCAD.</b></p>		
<p><b>Performance Objective</b></p>	<p><b>Critical Attributes</b></p>	<p><b>Benchmarks/Assessment</b></p>
<p>1. The student will make use of various options of the Zoom command to alter the display of the drawing.</p> <p>2. The student will understand the use of tiled viewports as a display option.</p>	<p>A. Can the student efficiently navigate through a variety of specific displays of his/her drawings?</p> <p>A. Can the student make effective use of tiled viewports to obtain multiple views of his/her drawing on the screen?</p>	<ul style="list-style-type: none"> <li>• The student will display his/her drawing in various close-ups and full views using options of the Zoom command.</li> <li>• The student will alternately set up the same drawing in different viewport configurations. The student will choose the most useful configuration and explain why.</li> </ul>

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**Curriculum Standard Four:** The student will understand the use of a effectively employ a variety of editing commands to modify existing drawing entities.

Performance Objective	Critical Attributes	Benchmarks/Assessment
<ol style="list-style-type: none"> <li>1. The student will move, copy, rotate, and mirror lines and shapes.</li> <li>2. The student will use scale, lengthen, trim, and extend commands to alter the size of existing objects.</li> <li>3. The student will understand the use of grips and their use in the editing process.</li> </ol>	<ol style="list-style-type: none"> <li>A. Can the student follow the command sequence to move, copy, rotate, and mirror objects accurately?</li> <li>A. Can the student choose the best command for the task at hand to modify the size of an object?</li> <li>A. Can the student activate grips on objects in the drawing and modify those objects accurately?</li> </ol>	<ul style="list-style-type: none"> <li>• The student will move, copy, rotate, and mirror existing objects to specified locations.</li> <li>• The student will modify the size of a number of existing objects through the use of the scale, lengthen, trim, and extend commands.</li> <li>• The student will perform a variety of modifications on an object after first activating grips.</li> </ul>

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**Curriculum Standard Five: The student will understand the use of text in AutoCAD drawings and employ a variety of commands to create and modify text.**

Performance Objective	Critical Attributes	Benchmarks/Assessment
<ol style="list-style-type: none"> <li>1. The student will choose the appropriate commands to enter text into a drawing.</li> <li>2. The student will make use of a variety of commands to modify existing text.</li> </ol>	<ol style="list-style-type: none"> <li>A. Can the student select fonts, text size, and location to enter the desired text on a drawing?</li> <li>A. Can the student select and execute the appropriate command to modify existing text in a specified manner?</li> </ol>	<ul style="list-style-type: none"> <li>• The student will enter specified text in different areas of a drawing, using different fonts and sizes.</li> <li>• The student will modify existing text.</li> </ul>

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**Curriculum Standard Six: The student will understand dimensioning practices for mechanical and architectural drawing and be able to correctly dimension drawings in both areas.**

Performance Objective	Critical Attributes	Benchmarks/Assessment
<ol style="list-style-type: none"> <li>1. The student will understand ANSI standards with regard to mechanical and architectural drawing.</li> <li>2. The student will understand the various dimensioning variables in AutoCAD and be able to adjust them for the task at hand.</li> <li>3. The student will understand the use of dimension styles.</li> <li>4. The student will understand the proper use of tolerancing symbols and how to generate them.</li> </ol>	<ol style="list-style-type: none"> <li>A. Can the student dimension a mechanical and an architectural drawing following ANSI standards?</li> <li>A. Can the student adjust dimension variables correctly to achieve proper appearance of dimensions on a drawing?</li> <li>A. Can the student make use of the dimension styles dialogue box to preset styles for both mechanical and architectural drawings?</li> <li>A. Can the student correctly place tolerancing symbols on a mechanical part?</li> </ol>	<ul style="list-style-type: none"> <li>• The student will draw a simple geometric shape and a small room floor plan and dimension each correctly.</li> <li>• The student will identify the proper settings for all of the dimension variables that apply to an assigned project.</li> <li>• The student will create and save complete style settings for mechanical and architectural drawing projects.</li> <li>• The student will draw a small mechanical part and use the necessary commands to place tolerancing symbols.</li> </ul>

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<p><b>Curriculum Standard Seven: The student will understand the use of and be able to apply a variety of advanced drawing construction commands.</b></p>		
Performance Objective	Critical Attributes	Benchmarks/Assessment
<p>1. The student will use hatch commands as an aspect of sectional drawings.</p>	<p>A. Can the student apply the appropriate hatch pattern in the appropriate portions of a sectional drawing?</p>	<ul style="list-style-type: none"> <li>• The student will draw a sectional view of a mechanical part and use hatch commands to complete it.</li> </ul>
<p>2. The student will understand the use of Block and Wblock commands in creating symbols for multiple use.</p>	<p>A. Can the student create, save, and insert blocks?</p>	<ul style="list-style-type: none"> <li>• The student will create a variety of plumbing symbols for an architectural floor plan. The student will save the symbols as blocks and insert them into the floor plan drawing.</li> </ul>
<p>3. The student will understand the use of attributes in relation to drawing blocks.</p>	<p>A. Can the student assign attributes to blocks?</p>	<ul style="list-style-type: none"> <li>• The student will assign attributes with data about doors to each door symbol in an architectural drawing.</li> </ul>

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<p><b>Curriculum Standard Eight: The student will understand how to create, modify, and display three-dimensional surface models.</b></p>		
Performance Objective	Critical Attributes	Benchmarks/Assessment
<p>1. The student will use User Coordinate System (UCS) and its relation to constructing 3-D surface models.</p> <p>2. The student will understand the process of constructing wire frames with 3-D faces and 3-D surface model objects.</p> <p>3. The student will understand the use of a variety of editing techniques to modify 3-D objects.</p>	<p>A. Can the student orient the UCS to desired locations and create, save, and restore UCS settings?</p> <p>A. Can the student build simple wire frame shapes and surface model objects?</p> <p>A. Can the student modify an existing 3-D object to exact specifications?</p>	<ul style="list-style-type: none"> <li>• The student will create features on various faces of a model, orienting the UCS to each face.</li> <li>• The student will construct several wire frame shapes and apply 3-D faces to them.</li> <li>• The student will construct several surface model objects.</li> <li>• The student will use dedicated 3-D editing commands to modify an existing 3-D object.</li> </ul>



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**Curriculum Standard Nine:** The student will use a variety of commands to create, edit, and display simple and complex solid model objects.

Performance Objective	Critical Attributes	Benchmarks/Assessment
<ol style="list-style-type: none"> <li>1. The student will understand how to work with regions to create solid primitives and composite solids.</li> <li>2. The student will understand the use of extrusion and revolving commands to create solid primitives.</li> <li>3. The student will use Boolean commands to construct complex composite solids.</li> </ol>	<ol style="list-style-type: none"> <li>A. Can the student create solid primitives and composite solids to exact specifications?</li> <li>A. Can the student properly apply the extrude and revolve commands to create desired solid primitives?</li> <li>A. Can the student correctly and efficiently apply Boolean commands to produce the desired composite solid?</li> </ol>	<ul style="list-style-type: none"> <li>• The student will use region commands to create several solid primitives and composite solids.</li> <li>• The student will create several solid primitives using extrude and revolve commands.</li> <li>• The student will construct several complex composite solids by applying Boolean commands to solid primitives.</li> </ul>