

Computer-Aided Design (CAD) - Course Outline

Computer-Aided Design (CAD) - Course Outline		Points Possible	Course Hours
Course Overview			4
Lab 1: Start the Course			
	<i>Identify computer requirements.</i>		
	<i>Learn how to move through the course.</i>		
	<i>Switch between windows.</i>		
Lab 2: Set Up Your Computer			
	<i>Find files and folders on a computer.</i>		
	<i>Set up a computer to show the List folder view and file name extensions.</i>		
	<i>Make a course folder.</i>		
Lab 3: Set Up a Browser and Install 7-Zip			
	<i>Set up a Web browser.</i>		
	<i>Download and install a zip utility.</i>		
Lab 4: Download Resources and Zip Assignments			
	<i>Get the course resources.</i>		
	<i>Install software.</i>		
	<i>Learn about finding, completing, and turning in assignments.</i>		
	<i>Zip and unzip files and folders.</i>		
Health and Safety in the Work Place			1
	<i>Define ergonomics and repetitive strain injury.</i>		
	<i>Identify common tips for better ergonomics while using computers.</i>		
	<i>Define OSHA (Occupational Safety and Health Administration).</i>		
	<i>Define Material Safety Data Sheets (MSDS).</i>		
Computer Basics			1
	<i>Define hardware, software, software programs, and operating systems.</i>		
	<i>Identify how to start and shut down a computer.</i>		
	<i>Identify input devices, output devices, and storage devices.</i>		
	<i>Identify tips for taking care of computer equipment.</i>		
	<i>Identify how to open a Help center on a computer.</i>		
	<i>Identify how to search a computer.</i>		
Project 1: Create Shapes			10
Lab 1: Explore CAD			
	<i>Define computer-aided design (CAD).</i>		
	<i>Identify the differences between freehand drawing, technical drawing, and CAD drawing.</i>		
	<i>Define drafting and identify the purpose of common drafting tools.</i>		
	<i>Identify common CAD careers.</i>		
Lab 2: Set Up a Drawing			
	<i>Create a new blank drawing in CadStd.</i>		
	<i>Set up the page size and orientation.</i>		
	<i>Set up the grid and snap.</i>		
	<i>Save a .cad file.</i>		
	<i>Use CadStd's Help page.</i>		
Lab 3: Use Coordinates			
	<i>Create and delete lines.</i>		
	<i>Use the Undo and Redo buttons.</i>		
	<i>Draw lines using absolute coordinates.</i>		
	<i>Draw lines using relative coordinates.</i>		
Lab 4: Create a House			
	<i>View a drawing by zooming, moving the drawing around, and returning to normal view.</i>		
	<i>Use the Rectangle Tool and Line Tool to draw shapes and lines.</i>		
	<i>Use the Change Entity Tool to change the shape of an object.</i>		
	<i>Use the Snap To End, Snap Intersection, and Snap To Mid Point commands.</i>		

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Lab 5: Create a Face			
	<i>Draw circles, ellipses, and arcs.</i>		
	<i>Copy, move, mirror, and rotate objects.</i>		
	<i>Use the Snap Center command to place an object in the center of a circle.</i>		
Assignment 1			
	<i>See assignment description document for detailed instructions.</i>	7	
Project 2: Create Orthographic Drawings			11
Lab 1: Explore Orthographic Projections			
	<i>Define 2-D and 3-D.</i>		
	<i>Define orthographic projection.</i>		
	<i>Identify the six main views of orthographic projection.</i>		
	<i>Identify the three views used in a three-view orthographic drawing.</i>		
	<i>Visualize 3-D objects from different views.</i>		
Lab 2: Draw a Front View			
	<i>Define alphabet of lines.</i>		
	<i>Define visible lines and construction lines.</i>		
	<i>Define layers.</i>		
	<i>Use construction lines to draw a front view.</i>		
	<i>Use layers to hide construction lines.</i>		
Lab 3: Draw Two Views			
	<i>Define dimensions.</i>		
	<i>Use dimensions and the grid to figure out the lengths of lines.</i>		
	<i>Identify the importance of accurate drawings.</i>		
	<i>Draw a front view and top view of a three-view orthographic drawing.</i>		
Lab 4: Draw a Three-View Orthographic Drawing			
	<i>Define hidden lines and visualize views with hidden lines.</i>		
	<i>Define scale and layout.</i>		
	<i>Apply guidelines for choosing a front view.</i>		
	<i>Draw a three-view orthographic drawing with hidden lines.</i>		
Lab 5: Draw a Hole			
	<i>Visualize orthographic views with holes.</i>		
	<i>Define symmetry.</i>		
	<i>Define center line.</i>		
	<i>Draw a hole using the Circle Tool, hidden lines, and center lines.</i>		
Quiz Study Guide			
	<i>Review the quiz study guide before taking the quiz.</i>		
Quiz 1			
	<i>Quiz on Project 1 and Project 2</i>	5	
Assignment 2			
	<i>See assignment description document for detailed instructions.</i>	10	
Project 3: Draw Sectional Views			7
Lab 1: Explore Sectional Views			
	<i>Define sectional view.</i>		
	<i>Define plane, cutting plane, and cutting plane line.</i>		
	<i>Define section lines.</i>		
	<i>Visualize sectional views of 3-D objects.</i>		
Lab 2: Draw a Sectional View			
	<i>Draw the outside and inside lines of a 3-D object for a sectional view.</i>		
	<i>Add center lines to holes in a sectional view.</i>		
	<i>Define angle.</i>		
	<i>Draw section lines.</i>		

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Lab 3: Place Cutting Planes			
	<i>Draw cutting plane lines on orthographic views.</i>		
	<i>Use the Arrow Tool to add arrows to the cutting plane lines.</i>		
	<i>Place cutting plane lines so they cut through important features.</i>		
	<i>Define full section, half section, and offset section.</i>		
	<i>Draw a cutting plane line for an offset section.</i>		
Assignment 3			
	<i>See assignment description document for detailed instructions.</i>	8	
Project 4: Create an Isometric Drawing			6
Lab 1: Explore Pictorial Drawings			
	<i>Define pictorial drawing and depth.</i>		
	<i>Identify types of pictorial drawings, such as axonometric, oblique, and perspective.</i>		
	<i>Define isometric drawing.</i>		
	<i>Identify measurements that can be taken from an isometric drawing.</i>		
Lab 2: Draw with Angles			
	<i>Use distance and angle measurements to draw lines in CAD.</i>		
	<i>Draw an isometric drawing.</i>		
	<i>Arrange three views and an isometric drawing on a page.</i>		
Quiz Study Guide			
	<i>Review the quiz study guide before taking the quiz.</i>		
Quiz 2			
	<i>Quiz on Project 3 and Project 4</i>	5	
Assignment 4			
	<i>See assignment description document for detailed instructions.</i>	4	
Project 5: Create an Oblique Drawing			4
Lab 1: Explore Oblique Drawings			
	<i>Define oblique drawing.</i>		
	<i>Identify which lines can be measured accurately in an oblique drawing.</i>		
	<i>Define foreshortening.</i>		
	<i>Calculate the real depth of a foreshortened object in an oblique drawing.</i>		
Lab 2: Draw with Oblique Angles			
	<i>Draw foreshortened lines of depth.</i>		
	<i>Draw an oblique drawing.</i>		
	<i>Arrange three views and an oblique drawing on a page.</i>		
Assignment 5			
	<i>See assignment description document for detailed instructions.</i>	4	
Project 6: Create a Perspective Drawing			5
Lab 1: Explore Perspective Drawings			
	<i>Define vanishing point and horizon line.</i>		
	<i>Identify common types of perspective, such as one-point, two-point, and three-point perspective.</i>		
	<i>Identify the main purpose of perspective drawings.</i>		
Lab 2: Draw in Two-Point Perspective			
	<i>Use vanishing points and construction lines to draw a cube in two-point perspective.</i>		
	<i>Change the cube into a different 3-D object, still in two-point perspective.</i>		
Assignment 6			
	<i>See assignment description document for detailed instructions.</i>	4	
Project 7: Draw an Auxiliary View			6
Lab 1: Explore Auxiliary Views			
	<i>Define auxiliary view.</i>		
	<i>Identify the purpose of auxiliary views.</i>		
	<i>Identify names of auxiliary views.</i>		
	<i>Visualize auxiliary views of 3-D objects.</i>		

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Lab 2: Draw with a Reference Plane			
	<i>Define perpendicular.</i>		
	<i>Define reference plane.</i>		
	<i>Draw a reference plane line.</i>		
	<i>Use a reference plane and construction lines to draw an auxiliary view.</i>		
Quiz Study Guide			
	<i>Review the quiz study guide before taking the quiz.</i>		
Quiz 3			
	<i>Quiz on Project 5, Project 6, and Project 7</i>	5	
Assignment 7			
	<i>See assignment description document for detailed instructions.</i>	4	
Project 8: Dimension Drawings			8
Lab 1: Dimension a Block			
	<i>Define dimensioning, dimension line, and extension line.</i>		
	<i>Define aligned dimensions and unidirectional dimensions.</i>		
	<i>Set the dimension settings.</i>		
	<i>Apply guidelines for good dimensioning.</i>		
Lab 2: Use Baseline Dimensioning			
	<i>Define relative dimensioning and baseline dimensioning.</i>		
	<i>Use baseline dimensioning to dimension an object.</i>		
	<i>Apply guidelines for good dimensioning.</i>		
Lab 3: Dimension a Circle			
	<i>Identify reasons for dimensioning, such as for size and location.</i>		
	<i>Use a leader line and the Text Tool to dimension a circle.</i>		
	<i>Apply guidelines for good dimensioning.</i>		
Lab 4: Explore Complex Dimensioning			
	<i>Identify ways that CAD standards apply to dimensioning.</i>		
	<i>Define dimensioning styles.</i>		
	<i>Define dimension line terminator.</i>		
	<i>Interpret drawings with advanced features, such as center line dimensioning, dual dimensioning, tolerance, and theoretical points of intersection.</i>		
Assignment 8			
	<i>See assignment description document for detailed instructions.</i>	10	
Project 9: Create Working Drawings			11
Lab 1: Explore Working Drawings			
	<i>Define working drawings.</i>		
	<i>Identify the contents of working drawings as detail drawings, assembly drawings, and a bill of materials.</i>		
Lab 2: Draw a Title Block			
	<i>Define title block and border line.</i>		
	<i>Draw a border.</i>		
	<i>Draw a title block.</i>		
	<i>Add attributes to a title block.</i>		
Lab 3: Draw a Detail Drawing			
	<i>Draw a detail drawing.</i>		
	<i>Set dimension settings.</i>		
	<i>Dimension an orthographic view to a center line.</i>		
Lab 4: Create a Bill of Materials			
	<i>Draw a bill of materials.</i>		
	<i>Use balloons to label parts of an assembly drawing.</i>		
	<i>Add information about the parts to the bill of materials.</i>		

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Lab 5: Export Working Drawings			
	<i>Identify ways to work well with clients.</i>		
	<i>Export .cad files to .dxf files, in proper order for a set of working drawings.</i>		
Quiz Study Guide			
	<i>Review the quiz study guide before taking the quiz.</i>		
Quiz 4			
	<i>Quiz on Project 8 and Project 9</i>	5	
Assignment 9			
	<i>See assignment description document for detailed instructions.</i>	10	
Project 10: Create a 3-D Design			11
Lab 1: Explore 3-D Space			
	<i>Define template.</i>		
	<i>Define model.</i>		
	<i>Use various tools to navigate a 3-D CAD environment.</i>		
Lab 2: Draw Edges and Surfaces			
	<i>Create and save a SketchUp project.</i>		
	<i>Define edge and surface.</i>		
	<i>Define snap and point inference.</i>		
	<i>Use the Line Tool, point inferences, and dots to draw edges.</i>		
	<i>Erase, undo, and redo work.</i>		
Lab 3: Create a House			
	<i>Define primitive.</i>		
	<i>Use a basic shape to create a 3-D object.</i>		
	<i>Move and rotate a 3-D object.</i>		
	<i>Apply patterns and color to a 3-D object.</i>		
Lab 4: Add Objects to the Yard			
	<i>Use the Measurements box to create objects of specific size.</i>		
	<i>Carve objects with the Push/Pull Tool.</i>		
	<i>Use the Follow Me Tool to create a 3-D object by moving a shape along a path.</i>		
	<i>Define standard part.</i>		
	<i>Import a model.</i>		
Lab 5: View Your Design and Reduce File Size			
	<i>View a design in various 2-D orthographic views.</i>		
	<i>View a design through a walkthrough.</i>		
	<i>Group parts to remove them for better viewing.</i>		
	<i>Purge old information to reduce the file size.</i>		
Quiz Study Guide			
	<i>Review the quiz study guide before taking the quiz.</i>		
Quiz 5			
	<i>Quiz on Project 10</i>	5	
Assignment 10			
	<i>See assignment description document for detailed instructions.</i>	9	
Exploring Design			5
Lab 1: The Design Process			
	<i>Identify the six main stages of the design process.</i>		
	<i>Identify common roles for people working on a team project.</i>		
	<i>Identify common challenges involved with scheduling a project.</i>		
Lab 2: Designing for People and the Environment			
	<i>Define ecology, green design, and sustainability.</i>		
	<i>Identify common challenges involved in designing for sustainability.</i>		
	<i>Identify ways to design for people with various levels of physical ability.</i>		
	<i>Describe the challenges involved in designing for people's needs, values, and social patterns.</i>		
Quiz 6			
	<i>Quiz on Exploring Design</i>	5	
		Total	90