Iowa CTE

Welding

Students understand the planning and layout operations used in welding processes. WLD1	1 **Interpret scaled welding prints; gather design and materials information; perform calculations; and use the detail to plan, lay out and produce parts or finished products.** WLD1.1
	2 **Understand the design parameters across welding-process organizational levels.** WLD1.2
	3 **Use current information technology ideation and design process systems in the manufacturing of welded parts and products.** WLD1.3
Students understand how materials can be processed through the use of welding tools and equipment. WLD2	1 **Understand the qualities of various raw and industrial materials and how these qualities affect the ability of the materials to be processed to produce useful and value-added welded parts and products.** WLD2.1
	2 **Use welding tools and equipment, such as MIG, TIG, arc, forge and furnace, to combine or join manufactured parts and products, resulting in a finished product that meets industry standards.** WLD2.2
Students understand various types of welding assembly processes. WLD3	1 **Bond industrial materials by using adhesive and cohesive processes, such as flow, pressure, cold and fusion bonding.** WLD3.1
	2 **Understand the processes used for finishing welded materials.** WLD3.2
	3 **Use welding tools, such as MIG, TIG, arc, forge, and furnace, and the equipment and assembly processes appropriate to the design criteria of a specific product to result in a finished product that meets industry standards.** WLD3.3
Students understand finishing processes and the differences between various types of finishing materials used in the manufacture of welded parts and products. WLD4	1 **Know the steps to be taken and the choices to be made in finishing welded materials.** WLD4.1
	2 **Understand how to select an appropriate finishing process to meet the design criteria of a specific welded product.** WLD4.2
Students understand the pr and	1 **Know the reasons for inspection and quality control in the manufacturing of welded parts.** WLD5.1

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welding manufacturing processes. WLD5	**2** Perform quality control inspections of welded parts. WLD5.2
	3 Know how to troubleshoot performance problems of welding systems. WLD5.3
Students understand various welding systems that require standard hand and machine tools. WLD6	**1** Understand the various welding systems used in conventional manufacturing industries in order to select and use appropriate tools, equipment and inspection devices. WLD6.1
	2 Select and use appropriate welding tools, equipment and inspection devices to manufacture parts or products. WLD6.2
Students understand various automated welding systems, welding design for manufacturing, flexible manufacturing systems and materials resource planning. WLD7	**1** Understand materials and processes in relation to welding systems. WLD7.1
	2 Understand welding processes involved in the following manufacturing systems: "just in time," design for manufacturing, flexible manufacturing systems and materials resource planning. WLD7.2
	3 Use computers to design and produce welded products, write numerical control programs and control robots. WLD7.3
	4 Understand the ways in which emerging welding systems may be integrated into current manufacturing processes. WLD7.4
	5 Understand the importance of maintaining documentation for welding systems. WLD7.5
Students understand various joining or combining processes, including welding processes used in manufacturing, maintenance and repair. WLD8	**1** Know various welding processes used to complete a fabrication, an assembly or a repair. WLD8.1
	2 Complete a fabrication, an assembly or a repair by using appropriate techniques and processes. WLD8.2
Students understand how a manufacturing company is organized and the elements of welding production management. WLD9	**1** Understand corporate structures that affect welding production. WLD9.1
	2 Understand that a welding production management system includes planning, engineering, organizing and controlling resources and manufacturing processes. WLD9.2
	3 Know how scheduling, quality control, accident prevention and inventory control are used efficiently and appropriately in a welding production management system. WLD9.3