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 purposes and processes of inspection and quality control in	1 **Know the reasons for inspection and quality control in the manufacturing of welded parts.** WLD5.1

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