Florida CTE

Computer Integrated Manufacturing (2024)

Demonstrate an understanding of manufacturing, its history, models, and procedures. The student will be able to: 33.0	1 **Explore manufacturing through research and projects.** 33.01
	2 **Understand what the enterprise wheel represents and how it represents the overall manufacturing scheme.** 33.02
	3 **Research a topic in manufacturing, develop a presentation, and present findings to a group.** 33.03
	4 **Explain the different procedures used in manufacturing.** 33.04
Demonstrate an understanding of control systems and methods to describe or document their processes. The student will be able to: 34.0	1 **Identify basic flowcharting symbols and discuss their functions.** 34.01
	2 **Create a flowchart that portrays a manufacturing process.** 34.02
	3 **Apply flowcharting to areas other than manufacturing.** 34.03
	4 **Identify a control system and explain its application to manufacturing.** 34.04
	5 **Model and create a program to control an automated system.** 34.05
Demonstrate an understanding of the cost of manufacturing. The student will be able to: 35.0	1 **Create a control system that replicates a factory cell.** 35.01
	2 **Maximize the efficiency of the manufacturing system with respect to time and cost.** 35.02
	3 **Compare the efficiency of running multiple systems against that of one large system.** 35.03
Demonstrate proficiency in designing products for manufacturability. The student will be able to: 36.0	1 **Use the design process.** 36.01
	2 **Use knowledge of design to analyze products with flaws.** 36.02
	3 **Use calculated volume, mass, surface area of parts to determine material cost, waste, and packaging requirements.** 36.03
	4 **Use solid modeling software to improve a flawed design.** 36.04

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	5 Determine whether a product is safe for a given audience (e.g., children under the age of three). 36.05
	6 Make ethical decisions about manufacturing. 36.06
	7 Create a product using solid modeling software. 36.07
Demonstrate an understanding of manufacturing processes. The student will be able to: 37.0	1 Explain the difference between primary and secondary manufacturing processes. 37.01
	2 Analyze a product to propose the manufacturing processes used to create it. 37.02
	3 Explore manufacturing processes via research. 37.03
	4 Explore prototyping processes. 37.04
Demonstrate an understanding of computer numeric control (CNC) as it relates to product design and development. The student will be able to: 38.0	1 Identify machines when given a process and identify the process that a given machine performs. 38.01
	2 Determine the appropriate speed rate for a given material using a tool with a given diameter. 38.02
	3 Determine the feed rate for a given material using a tool with a given diameter. 38.03
	4 Read and interpret G & M codes. 38.04
	5 Transfer the drawings made in CAD to a CAM program. 38.05
	6 Create numerical code using a CAM program. 38.06
	7 Verify the creation of a part using simulation software. 38.07
	8 Create parts using the machines demonstrated by the instructor. 38.08
	9 Create a product on the computer using knowledge of manufacturing processes. 38.09
Demonstrate an understanding of automation and robotics relative to the manufacturing process. The student will be able to: 39.0	1 Research a topic in automation. 39.01
	2 Identify the advantages and disadvantages of robotic labor versus human labor. 39.02
	3 Explore materials handling. 39.03
	4 Create and program virtual robotic work cells with simulation software. 39.04
	'rogram the interface between a robot and another machine. 39.05

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Demonstrate an understanding of the elements of power and the associated mathematics. The student will be able to: 40.0	**1** **Identify the three main power types.** 40.01
	2 **Solve problems involving electrical, pneumatic, and mechanical power.** 40.02
	3 **Convert power between units.** 40.03
	4 **Calculate torque and use it to calculate power.** 40.04
	5 **Solve problems involving fluid power.** 40.05
	6 **Construct a system to convert pneumatic power into mechanical power.** 40.06
Build, program, and configure a robot to perform predefined tasks. The student will be able to: 41.0	**1** **Build a robot.** 41.01
	2 **Create programs using robotic software that will allow the robot to perform a set of tasks.** 41.02
	3 **Configure servo motors to operate the robot.** 41.03
	4 **Formulate a list of tasks in which the robot can be used in a large scale CIM cell operation.** 41.04
Demonstrate an understanding of the elements of Computer Integrated Manufacturing (CIM). The student will be able to: 42.0	**1** **Identify the three categories of CIM systems.** 42.01