Automated Manufacturing Program Standards Criticality Survey 2018

1. Personal Qualities and People Skills				
Answer Choices	**Nice to Know**	**Need to Know**	**Critical to Know**	**Rating Average**
Demonstrate a positive work ethic by coming to work every day on time, a willingness to take direction, and motivation to accomplish the task at hand.	0	0	17	3.00
Demonstrate integrity by abiding by workplace policies and laws and demonstrating honesty and reliability.	0	1	16	2.94
Demonstrate teamwork skills by contributing to the success of the team, assisting others, and requesting help when needed.	0	4	13	2.76
Demonstrate positive self-representation skills by dressing appropriately and using language and manners suitable for the workplace.	1	8	8	2.41
Demonstrate diversity awareness by working well with all customers and co-workers.	0	7	10	2.59
Demonstrate conflict-resolution skills by negotiating diplomatic solutions to interpersonal and workplace issues.	0	11	6	2.35
Demonstrate creativity and resourcefulness by contributing new ideas and working with initiative.	1	11	5	2.24
			Answered	**17**
			Skipped	**0**

2. Professional Knowledge and Skills				
Answer Choices	**Nice to Know**	**Need to Know**	**Critical to Know**	**Rating Average**
Demonstrate effective speaking and listening skills by communicating effectively with customers and employees and following directions.	0	11	6	2.35
Demonstrate effective reading and writing skills by reading and interpreting workplace documents and writing clearly.	1	9	7	2.35
Demonstrate critical-thinking and problem-solving skills by analyzing and resolving problems that arise in completing assigned tasks.	0	9	8	2.47
Demonstrate healthy behaviors and safety skills by following safety guidelines and managing personal health.	0	4	13	2.76
Demonstrate understanding of workplace organizations, systems, and climates by identifying "big picture" issues and fulfilling the mission of the workplace.	2	10	5	2.18
Demonstrate lifelong-learning skills by continually acquiring new industry-related information and improving professional skills.	0	10	7	2.41
Demonstrate job acquisition and advancement skills by preparing to apply for a job and seeking promotion.	7	4	6	1.94
Demonstrate time, task, and resource management skills by organizing and implementing a productive plan of work.	1	9	6	2.31
Demonstrate mathematical skills by using mathematical reasoning to accomplish tasks.	2	6	9	2.41
Demonstrate customer service skills by identifying and addressing the needs of all customers and providing helpful, courteous, and knowledgeable service.	4	7	6	2.12
			Answered	**17**
			Skipped	**0**

3. Technology Knowledge and Skills				
Answer Choices	**Nice to Know**	**Need to Know**	**Critical to Know**	**Rating Average**
Demonstrate proficiency with job-specific technologies by selecting and safely using technological resources to accomplish work responsibilities in a productive manner.	2	7	8	2.35
Demonstrate proficiency with information technology by using computers, file management techniques, and software/programs effectively.	1	11	5	2.24
Demonstrate proper Internet use and security by using the Internet appropriately for work.	8	1	8	2.00
Demonstrate proficiency with telecommunications by selecting and using appropriate devices, services, and applications.	8	6	3	1.71
			Answered	**17**
			Skipped	**0**

	CONTENT STANDARD 1.0: LAB ORGANIZATION AND SAFETY PROCEDURES				
	Performance Standard 1.1: General Lab Safety Rules and Procedures				
	Answer Choices	**Nice to Know**	**Need to Know**	**Critical to Know**	**Rating Average**
1.1.1	Describe general shop safety rules and procedures.	0	8	8	2.50
1.1.2	Demonstrate knowledge of OSHA and its role in workplace safety.	4	6	6	2.13
1.1.3	Comply with the required use of safety glasses, ear protection, gloves, and shoes during lab/shop activities (i.e., personal protective equipment â€“ PPE).	0	5	11	2.69
1.1.4	Operate lab equipment according to safety guidelines.	0	6	10	2.63
1.1.5	Identify and use proper lifting procedures and proper use of support equipment.	1	6	9	2.50
1.1.6	Utilize proper ventilation procedures for working within the lab/shop area.	2	6	8	2.38
1.1.7	Identify the location and the types of fire extinguishers and other fire safety equipment; demonstrate knowledge of the procedures for using fire extinguishers and other fire safety equipment.	3	9	4	2.06
1.1.8	Identify the location and use of eye wash stations.	3	8	5	2.13
1.1.9	Identify the location of the posted evacuation routes.	3	8	5	2.13
1.1.10	Identify and wear appropriate clothing for lab/shop activities.	0	11	5	2.31
1.1.11	Secure hair and jewelry for lab/shop activities.	1	11	4	2.19
1.1.12	Understand knowledge of the safety aspects of low and high voltage circuits.	4	5	7	2.19
1.1.13	Locate and interpret safety data sheets (SDS).	5	7	4	1.94
1.1.14	Perform housekeeping duties.	4	8	4	2.00
1.1.15	Follow verbal instructions to complete work assignments.	0	5	11	2.69
1.1.16	Follow written instructions to complete work assignments.	0	6	9	2.60
				Answered	**16**
				Skipped	**1**

	Performance Standard 1.2: Hand Tools				
	Answer Choices	**Nice to Know**	**Need to Know**	**Critical to Know**	**Rating Average**
1.2.1	Identify hand tools and their appropriate usage.	3	6	7	2.25
1.2.2	Identify standards and metric designation.	4	7	5	2.06
1.2.3	Demonstrate the proper techniques when using hand tools.	2	9	5	2.19
1.2.4	Demonstrate safe handling and use of appropriate tools.	2	8	6	2.25
1.2.5	Identify proper cleaning, storage and maintenance of tools.	3	10	3	2.00
				Answered	**16**
				Skipped	**1**

	Performance Standard 1.3: Power Tools and Equipment				
	Answer Choices	**Nice to Know**	**Need to Know**	**Critical to Know**	**Rating Average**
1.3.1	Identify power tools and their appropriate usage.	2	9	5	2.19
1.3.2	Identify equipment and their appropriate usage.	2	8	6	2.25
1.3.3	Demonstrate the proper techniques when using power tools and equipment.	2	7	7	2.31
1.3.4	Demonstrate safe handling and use of appropriate power tools and equipment.	2	8	6	2.25
1.3.5	Identify proper cleaning, storage and maintenance of power tools and equipment.	3	8	5	2.13
				Answered	**16**
				Skipped	**1**

	CONTENT STANDARD 2.0: APPLY FUNDAMENTAL PRINT READING, MEASURING, AND CADD				
	Performance Standard 2.1: Demonstrate Print Reading Practices				
	Answer Choices	**Nice to Know**	**Need to Know**	**Critical to Know**	**Rating Average**
2.1.1	Interpret basic elements of a technical drawing (i.e., title block information, dimensions).	1	8	6	2.33
2.1.2	Identify industry standard symbols (i.e., hydraulic, pneumatic, electrical, welding, mechanical).	6	4	5	1.93
2.1.3	Prepare a materials list from a technical drawing.	5	5	5	2.00
2.1.4	Describe various types of drawings (i.e., part, assembly, pictorial, orthographic, isometric, and schematic).	5	7	3	1.87
2.1.5	Understand dimensioning and tolerance, sectional drawings, fasteners, tables, charts, and assembly drawings.	3	5	7	2.27
				Answered	**15**
				Skipped	**2**

	Performance Standard 2.2: Demonstrate Measuring and Scaling Techniques				
	Answer Choices	**Nice to Know**	**Need to Know**	**Critical to Know**	**Rating Average**
2.2.1	Identify industry standard units of measure.	2	4	9	2.47
2.2.2	Convert between customary (i.e., SAE, Imperial) and metric systems.	2	8	5	2.20
2.2.3	Determine appropriate engineering and metric scales.	4	7	4	2.00
2.2.4	Measure and calculate speed, distance, object size, area, and volume.	6	3	6	2.00
2.2.5	Determine and apply the equivalence between fractions and decimals.	1	7	7	2.40
2.2.6	Demonstrate proper use of precision measuring tools (i.e., micrometer, dial-indicator, dial-caliper) and inspecting parts to print.	2	4	9	2.47
				Answered	**15**
				Skipped	**2**

	Performance Standard 2.3 CADD, CAM				
	Answer Choices	**Nice to Know**	**Need to Know**	**Critical to Know**	**Rating Average**
2.3.1	Develop threeâ€dimensional models (i.e., wireframe, surface, solid, or parametric).	9	3	3	1.60
2.3.2	Interpret and create design and working drawings.	10	2	3	1.53
2.3.3	Properly post-process data to create G-code program.	8	2	4	1.71
				Answered	**15**
				Skipped	**2**

	Performance Standard 2.4 Simulation				
	Answer Choices	**Nice to Know**	**Need to Know**	**Critical to Know**	**Rating Average**
2.4.1	Demonstrate an understanding of simulation software.	9	4	2	1.53
				Answered	**15**
				Skipped	**2**

	CONTENT STANDARD 3.0: APPLY FUNDAMENTAL POWER SYSTEM PRINCIPLES				
	Performance Standard 3.1: Identify and Utilize Basic Mechanical Systems				
	Answer Choices	**Nice to Know**	**Need to Know**	**Critical to Know**	**Rating Average**
3.1.1	Understand examples of the six simple machines, their attributes and components.	6	7	1	1.64
3.1.2	Identify the power source of various systems machinery and tools.	8	3	3	1.64
3.1.3	Explain concepts of mechanical advantage.	9	4	1	1.43
3.1.4	Understand basic machine maintenance.	6	6	2	1.71
				Answered	**14**
				Skipped	**3**

	Performance Standard 3.2: Identify and Utilize Basic Fluid Systems				
	Answer Choices	**Nice to Know**	**Need to Know**	**Critical to Know**	**Rating Average**
3.2.1	Define fluid systems (e.g., hydraulic, pneumatic, vacuum).	9	2	3	1.57
3.2.2	Identify and define the components of fluid systems.	9	2	3	1.57
3.2.3	Compare and contrast hydraulic and pneumatic systems.	9	3	2	1.50
3.2.4	Identify the advantages and disadvantages of using fluid power systems.	9	3	2	1.50
3.2.5	Explain the difference between gauge pressure and absolute pressure.	7	4	3	1.71
3.2.6	Discuss the safety concerns of working with liquids and gases under pressure.	4	6	4	2.00
3.2.7	Discuss mechanical advantage using Pascalâ€™s law.	11	2	1	1.29
3.2.8	Discuss values in a pneumatic system, using the ideal gas laws.	11	2	1	1.29
3.2.9	Design, construct, and test various fluid systems.	10	3	1	1.36
				Answered	**14**
				Skipped	**3**

	Performance Standard 3.3: Identify and Utilize Basic Electrical Systems				
	Answer Choices	**Nice to Know**	**Need to Know**	**Critical to Know**	**Rating Average**
3.3.1	Define AC and DC electrical systems and terminology.	8	1	5	1.79
3.3.2	Discuss the safety concerns of working with electricity.	3	3	8	2.36
3.3.3	Describe the principles of generation, transmission, distribution, and storage of electricity.	10	3	1	1.36
3.3.4	Identify the advantages and disadvantages of using electrical systems.	9	4	1	1.43
3.3.5	Compute values of current, resistance, and voltage using Ohmâ€™s Law.	10	2	2	1.43
3.3.6	Identify series, parallel and series-parallel (combination) circuits.	10	1	2	1.38
3.3.7	Introduce single-phase and three-phase AC power.	9	3	2	1.50
3.3.8	Describe the laws, principles, and types of electricity to utilize equipment used in an industrial environment.	11	3	0	1.21
3.3.9	Construct and test simple electrical circuits from a schematic.	8	6	0	1.43
3.3.10	Explain electrical motor systems and motor controls by application.	8	5	1	1.50
				Answered	**14**
				Skipped	**3**

	CONTENT STANDARD 4.0: IDENTIFY AND APPLY MANUFACTURING PROCESSES				
	Performance Standard 4.1: Identify Material Properties and Science				
	Answer Choices	**Nice to Know**	**Need to Know**	**Critical to Know**	**Rating Average**
4.1.1	Identify the major material families used in manufacturing.	7	4	3	1.71
4.1.2	Differentiate between the various types of material properties and their application.	8	4	2	1.57
4.1.3	Discuss the impact of material usage on the environment.	12	2	0	1.14
4.1.4	Explain how production is affected by the availability, quality and quantity of resources.	7	7	0	1.50
4.1.5	Differentiate among raw material standard stock and finished products.	7	4	3	1.71
				Answered	**14**
				Skipped	**3**

	Performance Standard 4.2: Identify Manufacturing Processes				
	Answer Choices	**Nice to Know**	**Need to Know**	**Critical to Know**	**Rating Average**
4.2.1	Identify and describe the five major manufacturing processes (i.e., forming, separating, joining, conditioning, and finishing).	9	4	1	1.43
4.2.2	Discuss the impact of manufacturing processes on the environment.	10	4	0	1.29
4.2.3	Describe LEAN manufacturing and explain its importance.	7	6	1	1.57
				Answered	**14**
				Skipped	**3**

	Performance Standard 4.3: Apply Manufacturing Processes				
	Answer Choices	**Nice to Know**	**Need to Know**	**Critical to Know**	**Rating Average**
4.3.1	Demonstrate cutting methods of metals and plastics.	5	4	5	2.00
4.3.2	Demonstrate drilling methods of metals and plastics.	4	5	5	2.07
4.3.3	Demonstrate grinding methods of metals.	4	5	5	2.07
4.3.4	Demonstrate finishing methods of metals and plastics.	4	5	5	2.07
				Answered	**14**
				Skipped	**3**

	Performance Standard 4.4: Identify Fasteners				
	Answer Choices	**Nice to Know**	**Need to Know**	**Critical to Know**	**Rating Average**
4.4.1	Identify various fastening methods (e.g., rivets, welds, adhesive, screws, seams, etc.).	9	3	2	1.50
4.4.2	Categorize fastening methods by appropriate applications.	9	3	2	1.50
4.4.3	Demonstrate fastening methods on various materials.	9	3	2	1.50
				Answered	**14**
				Skipped	**3**

	CONTENT STANDARD 5.0: APPLY FUNDAMENTAL ELECTRONIC AND INSTRUMENTATION PRINCIPLES				
	Performance Standard 5.1: Demonstrate Control Technology and Automation Principles				
	Answer Choices	**Nice to Know**	**Need to Know**	**Critical to Know**	**Rating Average**
5.1.1	Research the history and fundamentals of automation and control systems.	10	3	0	1.23
5.1.2	Identify applications of control logic.	8	4	1	1.46
5.1.3	Distinguish programmable controllers and PLC components and their functions.	9	3	1	1.38
5.1.4	Interpret programming diagrams.	8	4	1	1.46
5.1.5	Program ladder logic statements to perform a specific task.	7	4	1	1.50
				Answered	**13**
				Skipped	**4**

	CONTENT STANDARD 6.0: MACHINING				
	Performance Standard 6.1: Manual Machining				
	Answer Choices	**Nice to Know**	**Need to Know**	**Critical to Know**	**Rating Average**
6.1.1	Hand-sharpen cutting tools.	9	2	2	1.46
6.1.2	Perform maintenance on machines and tools.	6	5	1	1.58
6.1.3	Deburr workpieces.	2	5	5	2.25
6.1.4	Setup and operate power saws.	4	6	2	1.83
6.1.5	Setup and operate grinders.	4	6	2	1.83
6.1.6	Handâ€sharpen cutting tools.	7	4	1	1.50
6.1.7	Setup and operate lathes including tool and parts setups.	2	6	4	2.17
6.1.8	Setup and operate milling machines including tool and parts setups.	2	6	4	2.17
6.1.9	Use appropriate inspection gages.	2	4	6	2.33
				Answered	**13**
				Skipped	**4**

	Performance Standard 6.2: CNC Machining				
	Answer Choices	**Nice to Know**	**Need to Know**	**Critical to Know**	**Rating Average**
6.2.1	Demonstrate an understanding of the control interface.	2	5	5	2.25
6.2.2	Demonstrate knowledge and the ability to properly mount stock.	2	3	7	2.42
6.2.3	Demonstrate a thorough understanding of tooling.	2	5	5	2.25
6.2.4	Demonstrate the ability to properly select an NC (numeric code) program.	2	6	4	2.17
6.2.5	Demonstrate the ability to verify and dry run the program.	2	4	6	2.33
6.2.6	Demonstrate the ability run the NC program.	2	5	5	2.25
6.2.7	Demonstrate an understanding of NC programming.	2	6	4	2.17
6.2.8	Demonstrate an understanding of coordinate systems.	2	4	6	2.33
6.2.9	Demonstrate the ability to develop an NC program.	4	6	2	1.83
6.2.10	Demonstrate the ability to edit an NC program.	3	6	3	2.00
				Answered	**12**
				Skipped	**5**

	CONTENT STANDARD 7.0: ADDITIVE (3D) PRINTING				
	Performance Standard 7.1: Operation				
	Answer Choices	**Nice to Know**	**Need to Know**	**Critical to Know**	**Rating Average**
7.1.1	Setup and operate a 3D printer.	10	2	0	1.17
7.1.2	Recognize design considerations.	9	2	1	1.33
				Answered	**12**
				Skipped	**5**

	CONTENT STANDARD 8.0 ROBOTICS AND MATERIALS HANDLING SYSTEMS				
	Performance Standard 8.1 Process Automation				
	Answer Choices	**Nice to Know**	**Need to Know**	**Critical to Know**	**Rating Average**
8.1.1	Demonstrate the knowledge of robotics and material handling equipment.	9	3	0	1.25
8.1.2	Discuss conveyors, robotic arms, material handlers, pick-and-place technology.	8	3	0	1.27
				Answered	**12**
				Skipped	**5**