



2022-2023

Technical Skills Assessment

Pre-Engineering

Results by Standard

Legend (%)		
0-50%	51-75%	76-100%

Assessment: Pre-Engineering	% Correct	% Correct	% Correct
Number tested: 119	20-21	21-22	22-23
CONTENT STANDARD 1.0: LAB ORGANIZATION AND SAFETY PROCEDURES	79.94%	81.52%	82.72%
Performance Standard 1.1: General Lab Safety Rules and Procedures	84.91%	85.42%	87.16%
1.1.1 Describe general shop safety rules and procedures.	84.03%	85.25%	87.30%
1.1.2 Demonstrate knowledge of OSHA and its role in workplace safety.	94.12%	96.72%	92.86%
1.1.3 Comply with the required use of safety glasses, ear protection, gloves, and shoes during lab/shop activities (i.e., personal protection equipment, (PPE)).	88.66%	88.52%	90.48%
1.1.4 Operate lab equipment according to safety guidelines.	79.83%	81.42%	82.28%
1.1.6 Utilize proper ventilation procedures for working within the lab/shop area.	96.64%	95.90%	98.41%
1.1.7 Identify marked safety areas and safety signage.	93.28%	90.16%	88.10%
1.1.8 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.	74.79%	66.39%	72.22%
1.1.9 Identify the location and use of eye wash stations.	95.80%	94.26%	98.41%
1.1.10 Identify the location of the posted evacuation routes.	97.48%	96.72%	98.41%
1.1.11 Identify and wear appropriate clothing for lab/shop activities.	94.54%	94.67%	95.24%
1.1.12 Secure hair and jewelry for lab/shop activities.	97.90%	96.31%	98.81%
1.1.13 Understand knowledge of the safety aspects of low and high voltage circuits.	30.25%	38.11%	40.87%
1.1.14 Locate and interpret safety data sheets (SDS).	88.24%	92.62%	96.83%
1.1.16 Follow verbal instructions to complete work assignments.	94.96%	95.90%	95.24%
1.1.17 Follow written instructions to complete work assignments.	93.70%	93.03%	96.03%
Performance Standard 1.2: Hand Tools	75.35%	81.97%	78.84%
1.2.3 Demonstrate the proper techniques when using hand tools.	58.82%	72.95%	65.08%
1.2.4 Demonstrate safe handling and use of appropriate tools.	83.61%	86.48%	85.71%
Performance Standard 1.3: Power Tools and Equipment	59.83%	63.28%	64.60%
1.3.3 Demonstrate the proper techniques when using power tools and equipment.	54.06%	58.47%	60.05%

Assessment: Pre-Engineering	% Correct	% Correct	% Correct
Number tested: 119	20-21	21-22	22-23
1.3.4 Demonstrate safe handling and use of appropriate power tools and equipment.	68.49%	70.49%	71.43%
CONTENT STANDARD 2.0: IMPACT OF ENGINEERING	90.76%	87.70%	87.30%
Performance Standard 2.3: Ethics in Engineering	90.76%	87.70%	87.30%
2.3.1 Knowledge of current professional engineering codes of ethics.	90.76%	87.70%	87.30%
CONTENT STANDARD 3.0: ENGINEERING DESIGN PROCESS	91.24%	90.52%	89.80%
Performance Standard 3.1: Design Process	91.24%	90.52%	89.80%
3.1.1 Identify and understand the common elements of a design process, including define the problem, generate concepts, develop a solution, develop a design proposal, construct and test a prototype, refine the design, evaluate a solution and communicate the processes and results.	93.00%	92.08%	90.48%
3.1.2 Apply the steps of the design process to solve a design problem.	89.92%	89.34%	89.29%
CONTENT STANDARD 4.0: ENGINEERING DOCUMENTATION	76.25%	78.37%	79.78%
Performance Standard 4.2: Measuring and Scaling Techniques	79.74%	80.72%	82.75%
4.2.1 Identify industry standard units of measure.	79.83%	82.38%	83.33%
4.2.2 Convert between industry standard units of measure.	82.77%	83.61%	76.59%
4.2.3 Determine appropriate engineering and metric scales.	68.91%	72.95%	72.62%
4.2.4 Measure speed, distance, object size, area, mass, volume, and temperature.	75.00%	71.31%	80.36%
4.2.5 Determine and apply the equivalence between fractions and decimals.	89.75%	89.51%	91.75%
4.2.6 Demonstrate proper use of precision measuring tools.	71.85%	79.10%	80.16%
Performance Standard 4.4: Technical Drawings	59.66%	67.21%	65.67%
4.4.3 Identify industry standard symbols.	62.75%	69.40%	66.14%
4.4.4 Describe and construct various types of drawings (i.e., part, assembly, pictorial, orthographic, isometric, and schematic) using proper symbols.	50.42%	60.66%	64.29%
CONTENT STANDARD 5.0: MATERIAL PROPERTIES	67.65%	67.21%	71.83%
Performance Standards 5.2: Materials Strength	67.65%	67.21%	71.83%
5.2.1 Describe the various forms of stress (i.e., compression, tension, torque, and shear).	67.65%	67.21%	71.83%
CONTENT STANDARD 6.0: FUNDAMENTAL POWER SYSTEMS AND ENERGY PRINCIPLES	73.88%	73.28%	75.80%
Performance Standard 6.1: Power Systems and Energy Forms	69.97%	71.20%	72.01%
6.1.1 Define terms used in power systems (e.g., power, work, horsepower, watts, etc.).	57.98%	59.43%	60.91%
6.1.2 Identify the basic power systems.	70.17%	67.21%	66.27%
6.1.3 List the basic elements of power systems.	68.07%	78.69%	75.40%
6.1.4 Summarize the advantages and disadvantages of various forms of power.	77.31%	71.31%	74.60%
6.1.6 Define energy.	70.03%	74.59%	74.34%
6.1.7 Define potential energy and kinetic energy.	88.24%	88.11%	87.70%

Assessment: Pre-Engineering	% Correct	% Correct	% Correct
Number tested: 119	20-21	21-22	22-23
6.1.8 Identify forms of potential energy and kinetic energy.	93.28%	90.16%	92.06%
6.1.10 Identify units used to measure energy.	52.10%	55.74%	63.49%
Performance Standard 6.2: Basic Mechanical Systems	92.44%	88.52%	92.06%
6.2.4 Calculate mechanical advantage and drive ratios of mechanisms.	92.44%	88.52%	92.06%
Performance Standard 6.3: Energy Sources and Applications	77.43%	75.88%	76.76%
6.3.3 Measure circuit values using a multimeter.	66.39%	62.02%	63.76%
6.3.6 Compute values of current, resistance, and voltage using Ohms law.	89.50%	86.89%	90.48%
6.3.7 Solve series and parallel circuits using basic laws of electricity including Kirchhoffs laws. Test and apply the relationship between voltage, current, and resistance relating to a	81.93%	85.66%	82.54%
Performance Standard 6.4: Machine Control Systems	57.14%	58.20%	63.10%
6.4.3 Select appropriate input and output devices based on system specifications and constraints.	69.75%	64.75%	70.63%
6.4.4 Differentiate between the characteristics of digital and analog devices.	39.50%	36.07%	41.27%
6.4.5 Compare and contrast open and closed loop systems.	59.66%	65.98%	70.24%
Performance Standard 6.5: Basic Fluid Systems	84.14%	80.53%	86.41%
6.5.1 Define fluid systems (e.g., hydraulic, pneumatic, vacuum, etc.).	95.80%	89.34%	95.24%
6.5.5 Explain the difference between gauge pressure and absolute pressure.	79.83%	72.54%	84.33%
6.5.6 Discuss the safety concerns of working with liquids and gases under pressure.	85.99%	88.25%	86.24%