Welding Technician 2

Exam Information

Exam number
596

Items
55

Points
59

Prerequisites
Welding Technician 1

Recommended course length
One year

National Career Cluster
Architecture & Construction

Performance standards
Included (Optional)

Certificate available
Yes

Description

The Welding Technician 2 industry certification exam assesses the learners' application of advanced welding techniques and skills in the workplace. The exam evaluates learners' technical knowledge of performing tasks autonomously, including the selection and use of appropriate techniques and equipment with minimal supervision.

Exam Blueprint

Standard	Percentage of exam
1. Development Activities	5%
2. Work-Place Readiness	3%
3. Welding Processes and Procedures	8%
4. Welding Safety Practices	17%
5. Read and Interpret Welding Symbols	22%
6. (FCAW) Process	14%
7. (GTAW) Process	17%
8. (CAC-A) or Gouging Process	5%
9. Plasma Arc Cutting Process	8%

Standard 1

Students will participate in personal and leadership development activities through SkillsUSA or another appropriate career and technical student organization.

Objective 1 Students will use communication skills to effectively communicate with others.

1. Understand when it is appropriate to listen and to speak.
2. Understand and follow verbal and written instructions for classroom and laboratory activities.

Objective 2 Students will effectively use teamwork to respectfully work with others.

1. Identify and understand different roles in working with a team

Objective 3 Students will use critical thinking and problem-solving skills

1. Analyze the cause of the problem.
2. Develop a solution to address the problem.
3. Implement the plan.
4. Evaluate the effectiveness of the plan.

Objective 4 Students will be dependable, reliable, steady, trustworthy and consistent in performance and behavior.

1. Set and meet goals on attendance and punctuality.
2. Prioritize, plan and manage work to complete assignments and projects on time.

Objective 5 Students will be accountable for results.

1. Use an achievement chart for activities and behaviors in class that encourages a personal evaluation of classroom performance.
2. File a regular written report on progress toward completion of assignments and projects.

Objective 6 Be familiar with the legal requirements and expectations of the course.

1. Be familiar with the course disclosure statement and all requirements for successful completion of the course.
2. Demonstrate workplace ethics, e.g. fair, honest, disciplined.

Standard 1 Performance Evaluation included below (Optional)

Standard 2

Students will participate in work-place readiness activities.

Objective 1 Students will demonstrate employability skills.

1. Use a career search network to find career choices.
2. Write a resume including a list of demonstrated skills.
3. Write a letter of application.
4. Complete a job application.
5. Participate in an actual or simulated job interview.

Objective 2 Students will participate in a work-based learning experience outside the classroom.

1. Students will plan and implement a work-based learning experience aligned with their career goal.

Standard 2 Performance Evaluation included below (Optional)

Standard 3

Students will understand welding processes and procedures.

Objective 1 Identify weld joints, weld types and weld positions.

1. Identify the five welding joints: butt, corner, edge, lap and tee.
2. Identify fillet and groove welds.
3. Identify the four welding positions: flat, horizontal, vertical, and overhead.

Standard 4

Students will demonstrate appropriate welding safety practices for laboratory and work settings.

Objective 1 Implement safety practices related to welding.

1. Identify, select, and properly use appropriate personal protective equipment (PPE).
2. Verify that all equipment is in good operating condition and that appropriate safety devices are in place and working (e.g., guards in place, tool rests adjusted, etc.).
3. Maintain a neat, well-organized laboratory or shop working area.

Objective 2 Identify fire hazard conditions and actions to take in case of fire.

1. Explain combustion and identify three conditions necessary for it to occur.
2. Describe fire prevention in a welding shop or work site.
3. Explain classes of fires and appropriate extinguishers.

Objective 3 Take appropriate actions in an accident or emergency.

1. Demonstrate the use of simple first aid in an accident with an injury.
2. Locate first aid kits and investigate their contents and use in appropriate settings.
3. Discuss appropriate safety responses in an accident or emergency.

Standard 4 Performance Evaluation included below (Optional)

Standard 5

Students will read and interpret welding symbols and drawing symbols identified in blueprints.

Objective 1 Use intermediate math and measuring skills to enhance layout techniques.

1. Calculate the circumference of a circle.
2. Use Pythagorean Theorem to calculate the missing side of a triangle (3-4-5 rule).
3. Correctly use and interpret reading on a dial caliper.

Objective 2 Read and interpret welding blueprints.

1. Interpret the tolerance dimensions found on a blueprint in decimals, fractions, and degrees.
2. Draw blueprints for simple welding projects.

Objective 3 Identify and apply basic welding symbols.

1. Identify and interpret basic welding symbols including bevel groove weld, plug or slot weld, melt through, intermittent fillet weld, and contour symbols.
2. Identify and interpret drawings describing the anatomy of a groove and fillet weld.
3. Draw welding symbols for given specification.
4. Interpret a welding print and welding procedure specifications.

Standard 6

Students will use the Flux Cored Arc Welding (FCAW) process.

Objective 1 Set up for FCAW operations on carbon steel.

1. Properly set up a welding machine.
2. Identify wire classification

Objective 2 Properly set up and complete fillet and groove welds in the flat and horizontal position with FCAW process.

1. Make 1F (flat position-fillet weld) welds on carbon steel.
2. Make 2F (horizontal position-fillet weld) welds on carbon steel.
3. Make 1G (flat position-groove weld) welds on carbon steel.

Standard 6 Performance Evaluation included below (Optional)

Standard 7

Students will use the Gas Tungsten Arc Welding (GTAW) process.

Objective 1 Set up for GTAW operations on carbon steel

1. Properly set up a welding machine.
2. Identify filler rod classifications.
3. Identify tungsten electrode classifications; lanthanated, ceriated, thoriated and pure.

Objective 2 Properly set up and complete fillet and groove welds in the flat and horizontal position with GTAW process.

1. Make 1F (flat position-fillet weld) welds on carbon steel.
2. Make 2F (horizontal position-fillet weld) welds on carbon steel.
3. Make 1G (flat position-groove weld) welds on carbon steel.

Standard 7 Performance Evaluation included below (Optional)

Standard 8

Students will use the Carbon Arc Cutting (CAC-A) or gouging process.

Objective 1 Set up for Carbon Arc Cutting (CAC-S) gouging operations on carbon steel.

1. Properly set up Carbon Arc machine.
2. Identify Carbon Arc electrodes.

Objective 2 Properly set up and complete gouging operation.

1. Perform straight gouging operations on carbon steel.
2. Pierce a hole through a carbon steel plate.

Standard 8 Performance Evaluation included below (Optional)

Standard 9

Students will use the Plasma Arc cutting process.

Objective 1 Set up for plasma arc cutting operations on carbon steel.

1. Properly set up Plasma Arc machine.

Objective 2 Properly set up and complete cutting operation.

1. Perform straight cutting operations on carbon steel.
2. Perform shape cutting operations on carbon steel.

Standard 9 Performance Evaluation included below (Optional)

Welding Technician 2

Performance assessments may be completed and evaluated at any time during the course. The following performance skills are to be used in connection with the associated standards and exam. To pass the performance standard the student must attain a performance standard average of 8 or higher on the rating scale. Students may be encouraged to repeat the objectives until they average 8 or higher.

Student's Name: _____

Class: _____

Performance standards rating scale

0	Limited skills	2	→	4	Moderate skills	6	→	8	High skills	10

Standard 1 – Development Activities **Score:**

- File a regular written report on progress toward completion of assignments and projects.

Standard 2 – Work-Place Readiness **Score:**

- Students will plan and implement a work-based learning experience aligned with their career goal.

Standard 4 – Welding Safety Practices **Score:**

- Maintain a neat, well-organized laboratory or shop working area.

Standard 6 – (FCAW) Process **Score:**

- Use FCAW process to make 1G (flat position-groove weld) welds on carbon steel.

Standard 7 – (GTAW) Process **Score:**

- Use GTAW process to make 1G (flat position-groove weld) welds on carbon steel.

Standard 8 – (CAC-A) or Gouging Process **Score:**

- Use Carbon Arc Cutting process to pierce a hole through a carbon steel plate.

Standard 9 – Plasma Arc Cutting Process **Score:**

- Use Plasma Arc cutting process to perform straight cutting operations on carbon steel.

Performance standard average score:

Evaluator Name: _____

Evaluator Title: _____

Evaluator Signature: _____

Date: _____