

**2010/2011 Welding**  
**PTT302 - 36 weeks**  
**DoDEA Course Description and Competencies**

**About the Program**

Welding prepares students for careers in the Transportation, Distribution and Logistics industry. The course sequence focuses on duties and tasks performed by professionals in Facility and Mobile Equipment Maintenance as well as pre-employment and employment skills.

**Major Concepts/Content:** The welding course is designed to teach current welding practices with emphasis given to hands-on experience rather than to formal classroom theory. Exercises allow students to achieve proficiency in the basic welding methods of arc welding, oxyacetylene welding, and cutting. Students learn the basic equipment, welding positions, and joint design. The content includes, but is not limited to, the study of the following: the integration of skills, attitudes, and knowledge necessary to fulfill the qualifications for an industrial related job in industry or in education; the application of safety and health procedures.

**Major Instructional Activities:** Instructional activities used in a laboratory setting will provide hands-on experience with welding equipment and materials related to the course content. Students will complete welding activities, investigate content-related occupations, present ideas and information orally and in writing. Emphasis will be placed on self-concepts, values, decision-making skills and work skills.

**Major Evaluative Techniques:** Students will be required to pass laboratory safety tests as well as content- and process-related tests. Welding activities/projects will be evaluated for completeness and accuracy. Written and oral reports will be evaluated for content and form. Class participation will be evaluated using criteria such as working cautiously on a project, using materials properly, conscientiously assisting others, working independently, offering solutions to problems, and completing projects.

The table below is a competency list for the Welding course. The competencies are considered essential and are required of all students.

PTT301 36 weeks	Welding <b>TASKS/COMPETENCIES</b>
<b>Implementing DoDEA's CTE Course Requirements</b>	
• 001	Demonstrate DoDEA's Workplace Readiness Skills in course activities.
• 002	Identify issues related to the field of study that affect the environment and impact local and global communities.
• 003	Identify Internet safety issues and procedures for complying with acceptable use standards.
<b>Applying Basic Construction Safety Standards (Core Safety)</b>	
• 004	Comply with federal, state, and local safety legal requirements, including OSHA, VOSHA, and EPA.
• 005	Inspect and maintain a safe working environment.
• 006	Explain safe working practices around electrical hazards.
• 007	Identify emergency first aid procedures.
• 008	Identify the types of fires and the methods used to extinguish them.
• 009	Identify PPE (personal protective equipment) requirements.

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• 010	Inspect course-specific hand and power tools to visually identify defects.
• 011	Report injuries.
• 012	Report personal, environmental, and equipment safety violations to the appropriate authority.
<b>Demonstrate General Welding Techniques</b>	
• 013	Explain the theories behind SMAW, GMAW, GMAW-S, FCAW-G, GTAW, OFC, OFC Track Burner, CAC-A, and PAC.
• 014	Perform safety inspections of all equipment and accessories.
• 015	Identify minor external repairs to all equipment and accessories.
<b>Interpreting Drawing and Welding Symbol Interpretation</b>	
• 016	Interpret welding symbol information.
• 017	Fabricate simple parts from a drawing or sketch.
<b>Demonstrating Shielded Metal Arc Welding (SMAW)</b>	
• 018	Set up for shielded metal arc welding operations and base metal preparation on carbon steel.
• 019	Operate shielded metal arc welding equipment.
• 020	Perform single pass fillet welds, all positions, on carbon steel.
• 021	Perform V-groove welds, all positions, on carbon steel, limited thickness.
<b>Demonstrating Gas Metal Arc Welding (GMAW, GMAW-S)</b>	
• 022	Set up for gas metal arc welding operations and base metal preparation on carbon steel.
• 023	Operate gas metal arc welding equipment.
• 024	Perform single pass fillet welds, all positions, on carbon steel, using short circuit transfer.
• 025	Perform V-groove welds, all positions, on carbon steel, using short circuit transfer.
• 026	Perform 1F-2F single pass welds on carbon steel, using spray transfer.
• 027	Perform 1G welds on carbon steel, limited thickness, using spray transfer.
<b>Demonstrating Flux Cored Arc Welding (FCAW-G)</b>	
• 028	Set up for flux-cored arc welding operations and base metal preparation on carbon steel.
• 029	Operate flux-cored arc welding equipment.
• 030	Perform single pass fillet welds, all positions, on carbon steel.
<b>Gas Tungsten Arc Welding (GTAW)</b>	
• 031	Set up for gas tungsten arc welding operations and base metal preparation on carbon steel, aluminum, and stainless steel.
<b>Demonstrating Manual Oxyfuel Gas Cutting (OFC)</b>	
• 032	Set up for manual oxyfuel gas cutting operations and base metal preparation on carbon steel.
• 033	Operate manual oxyfuel cutting equipment.
• 034	Perform straight cutting operations on carbon steel.
• 035	Perform shape-cutting operations on carbon steel.
• 036	Perform bevel-cutting operations on plain carbon steel.
<b>Demonstrating Machine Oxyfuel Gas Cutting (OFC Track Burner)</b>	
• 037	Set up for machine oxyfuel gas cutting (track burner) operations on carbon steel.

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• 038	Operate machine oxyfuel gas cutting (track burner) equipment.
• 039	Perform straight-cutting operations on carbon steel.
• 040	Perform bevel-cutting operations on carbon steel.
<b>Demonstrating Carbon Arc Cutting (CAC-A)</b>	
• 041	Set up for manual air carbon arc cutting equipment.
• 042	Operate manual air carbon arc cutting equipment.
• 043	Perform metal removal operations on carbon steel.
<b>Demonstrating Plasma Arc Cutting (PAC)</b>	
• 044	Set up for manual plasma arc cutting operations.
• 045	Operate manual plasma arc cutting equipment.
• 046	Perform shape cutting operations.
<b>Demonstrating Visual Examination Principles and Practices</b>	
• 047	Examine cut surfaces and edges of prepared base metal parts.
• 048	Examine tack, intermediate layers, and completed welds.
<b>Enhancing Career Exploration and Employability Skills</b>	
• 049	Conduct a job search.
• 050	Create or update a portfolio containing representative samples of student work.