Precision Gas Tungsten Arc Welding *

Course Information

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Credits	9
Campus	Highlands College

Description

Through classroom and/or lab/shop learning and assessment activities, students in this course will learn the gas tungsten arc welding (GTAW) process in thin wall stainless steel and Inconel, demonstrate the safe and correct set-up of the GTAW work station, and relate GTAW electrode and filler metal classifications with base metals. They will perform basic GTAW welds on selected weld joints including flat butt welds, lap joints, tee joints, 6G tube welds, and 5F tube to plate fillet welds. Students will learn to perform visual inspection of GTAW welds to AWS D17.1 standards. After the completion of all weld joints students will learn advanced GTAW techniques as they pertain to the aerospace fabrication industry. Students will learn to weld parts on a rotating turn-table and use fixtures to build parts to tight tolerances.

Textbooks

Hobart Institute of Welding GTAW of Stainless Steel and Titanium

Attendance

Attendance is required and will make up 50% of the grade for the semester. Roll will be taken immediately at the start of class. 100 points will be given per day for attendance for students that show up on time. If a student will be late for class and they notify the instructor before the start of class they will receive 75 points for attendance for the day. Students that show up late and don't call in or call in after the start of class will receive 50 points for the day. A student that misses class completely or shows up later than half way through the class period with or without prior approval will receive 0 points for the day. **Remember: Half of your grade is based on attendance! If you don't show up you will not pass!**

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Exams and Assignments

Midterm Exam
Class Participation
Final Exam
Attendance
Traveler Accuracy
Weekly Time Cards

Grade Breakdown

Class Assignments/Quizzes	25%
Attendance	50%
Final Exam	25%

Co-requisites

Shop Safety
Technical Math
Developmental Writing
Quality Control, Blueprint Reading, and Precision Measurement
Weld visual Inspection

Safety

Students will be required to abide by all shop safety rules. Any student failing to follow safety guidelines may be given a failed grade and will be removed from the program. Students will be responsible to provide their own safety equipment including:

- Safety glasses rated ANSI Z87+
- Sturdy shoes or boots. Safety toe shoes recommended (required for employment at MPP).

Course Outline

1) GTAW Orientation

a) Brief history of TIG welding
b) Identify the method of operation
c) Identify the Characteristics of current polarity
d) Description of equipment and materials used for GTAW welding
e) Safety considerations for GTAW welding

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2) **Setup and Basic Operation of GTAW Equipment**
   a) Machine preventative maintenance and inspection
   b) Torch components
   c) Preparation of the tungsten electrode
   d) Filler metal identification
   e) Equipment setup and adjustment
   f) Operation of GTAW welding Equipment
   g) Completion of simple weld bead on flat material.

3) **Weld Coupons**
   a) Lap joint without filler metal
   b) Lap joint with filler metal
   c) T joint without filler metal
   d) T joint with filler metal
   e) Square groove butt weld on plate
   f) 6G square groove butt weld on .250 dia. X .035 wall SS tubing
   g) 6G square groove butt weld on .250 dia. X .016 wall SS tubing
   h) 6G square groove butt weld on 1.75 dia. X .020 wall Inco 625

4) **Aerospace Fabrication**
   a) Turntable welding
   b) 1.5" dia. Square groove butt weld on turntable
   c) 4.5" dia. Square groove butt weld on turntable
   d) Fixture usage and care
   e) Fixture projects

Note: Safety glasses are REQUIRED in the shop at ALL times.

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