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WLDG 275.01: Gas Metal Arc Welding

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**MISSOULA COLLEGE
THE UNIVERSITY OF MONTANA
INDUSTRIAL TECHNOLOGY DEPARTMENT
WELDING PROGRAM**

COURSE SYLLABUS

COURSE NUMBER AND TITLE: WLDG 275 Gas Metal Arc Welding

DATE REVISED: Spring 2015

SEMESTER CREDITS: 4

PREREQUISITES: WLDG 187 Flux Core Arc Welding

FACULTY: Mark Raymond

E-Mail: mark.raymond@mso.umt.edu

Phone: 406-243-7647

Office: West Campus Welding Lab

Office Hours: 12:00noon to 1:00p.m. or by appointment

RELATIONSHIP TO PROGRAM(S):

COURSE DESCRIPTION:

Theory and safe operation of Gas Metal Arc Welding (GMAW). Theory of flux core arc welding applied to GMAW. Primary focus on application, practical skill development, and producing welds that meet AWS and industry standards. Metals welded are low carbon steel, stainless steel, and aluminum. Short circuit arc, spray arc, and pulse transfer are used. Examination of gas and electrode selection.

STUDENT PERFORMANCE OUTCOMES:

Occupational Performance Objectives

Upon completion of this course, the student will be able to:

1. To develop skill thru safe operation of Gas Metal Arc welding equipment
2. To develop comprehension of the technical aspects of GMAW, terms, concepts, equipment.
3. To develop skill in the preparation and welding of coupons and assemblies with GMAW
4. To develop an awareness of and skill in working to industry quality standards

STUDENT PERFORMANCE ASSESSMENT METHODS AND GRADING PROCEDURES:

Grading Scale:

93 - 100 A
82 - 92 B
70 - 81 C
60 - 69 D
0 - 59 F

NOTE: Courses must be passed with a 'C minus (C-)' or greater to count toward degree/certificate requirements.

Grading Breakdown:

Practical hands-on welding exams	40%
Practical lab assignments	15%
Written exams/assignments	25%
Quizzes	10%
Notebook	5%
Professionalism	5%

Practical Hands on Welding Tests: Upon successful completion of lab assignments a hands-on welding test derived from written specifications and graphics (drawings) will be administered. It will be graded based upon execution i.e., fit-up, weld profile, workmanship, etc. as prescribed by AWS standards.

Practical Lab assignments: Required lab assignments (those that have been demonstrated and identified as required) satisfactorily completed by the student.

Written tests/assignments: these tests/assignments are derived from reading assignments given in class (homework), notes from class lectures, video presentations, etc.

Quizzes are composed of student name/date and three questions. Name and date are worth 25%. Each question is worth 25%. To receive credit for questions they must be written out and correctly answered. Quizzes may be given at any time during the course scheduled meeting time.

Completed Notebook is a compilation of class notes and handouts. To receive the full 5% credit, the notebook must be neat, organized, contained or be found contiguous within a three-ring binder.

Professionalism is defined as a combination of one's attitude, motivation, participation, organization and work area cleanliness.

ATTENDANCE POLICY:

Attendance is not taken, although you are required to be in attendance to successfully complete the course.

OTHER POLICIES:

1. **Safety** is required to be practiced at all times. Disregarding safety practices, endangering yourself or others may result in your being denied access to the lab areas.
2. **Eye protection** is mandatory at all times in the lab area.
3. **Cell Phones** are not allowed in the classroom or the lab during class time.

REQUIRED TEXTBOOKS:

Welding Principles and Practices, 4th Edition; Edward R. Bohnart
<http://content.lincolnelectric.com/pdfs/products/literature/c4200.pdf>

OTHER REQUIRED READING: As assigned.

WRITING ASSIGNMENTS: Minimum of one.

REQUIRED SUPPLIES:

- Welding helmet
- 2. Lightweight welding gloves (GTAW)
- 3. SMA, FCAW, GMAW welding gloves
- 4. Eye protection
- 5. Pliers with wire cutting capabilities
- 6. Wire hand brush
- 7. Chipping hammer
- 8. Coveralls or equivalent
- 9. Tape measure (12 foot minimum)
- 10. Lock for locker
- 11. Calculator
- 12. Individual handheld right angle grinder

ACADEMIC INTEGRITY: All students must practice academic honesty. Academic misconduct is subject to an academic penalty by the course instructor and/or a disciplinary sanction by the University. All students need to be familiar with the Student Conduct Code. The Code is available for review online at <http://www.umt.edu/SA/VP/SA/index.cfm/page/1321>.

DISABILITY ACCOMMODATION: Eligible students with disabilities will receive appropriate accommodations in this course when requested in a timely way. Please contact me after class or in my office. Please be prepared to provide a letter from your DSS Coordinator. For more information, visit the Disability Services website at <http://www.umt.edu/dss/> or call 406.243.2243 (Voice/Text).

NOTE: Faculty reserves the right to modify syllabi and assignments as needed based on faculty, student, and/or environmental circumstances.

COURSE OUTLINE:

- 1. Gas Metal Arc Welding (GMAW) theory of operation
- 2. Safe operation of GMAW
- 3. GMAW power sources
- 4. GMAW Wire feeders
- 5. GMAW torches and related equipment
- 6. GMAW electrodes, gasses
- 7. Practical welding experience of:
 - a. carbon steel, groove and fillet welds to industry standards
 - b. aluminum, groove and fillet welds to industry standards
 - c. stainless steel, groove and fillet welds to industry standards
- 8. Codes and Standards relating to Gas Metal Arc Welding
- 9. Quality assessment of welded components using Gas Metal Arc Welding.