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WLDG 187.01K: Flux Core Arc Welding

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

COURSE SYLLABUS

COURSE NUMBER AND TITLE: WLDG 187.01 - 35210, Flux Cored Arc Welding

DATE REVISED: Spring 2016

SEMESTER CREDITS: 4

PREREQUISITES: SMAW, OAW, & OFC via WLDG 180

INSTRUCTOR NAME: Steve Patrick

PHONE NUMBER: 243-7638

OFFICE LOCATION: West Campus, Welding Lab Office

OFFICE HOURS: 2:00 PM – 10:00 PM or by appointment

RELATIONSHIP TO PROGRAM(S):

This class provides theory of operations and skill development with a process that is primary in the welding of iron and steel. This experience complements the other welding processes taught in the program to attain a solid, broad based understanding of welding as an industrial metals joining process.

COURSE DESCRIPTION: This class covers the theory, practice, and safe operation of Flux Core Arc Welding and Gas Metal Arc Welding equipment. Students will weld coupons on plate in the flat, horizontal, and vertical positions to industrial standards using a variety of welding electrodes, diameters, and power sources. This activity will prepare the student for welding qualification to American Welding Society Structural Welding Code specifications.

STUDENT PERFORMANCE OUTCOMES:

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

- Demonstrate by written exam, the theory and safe operation of FCAW & GMAW equipment.
- Demonstrate by practical exam, evaluated to AWS Structural Welding Code-Steel (AWS D1.1) standards, skill in the use of FCAW & GMAW equipment and materials.

STUDENT PERFORMANCE ASSESSMENT METHODS AND GRADING PROCEDURES:

NOTICE! Be aware that each course listed in your degree or certificate program must be completed with a C or better to graduate or receive a certificate.

GRADING:

Practical Hands on Welding Tests.....	50%	A = 93% - 100%
Tests.....	30%	B = 92% - 82%
Quizzes.....	10%	C = 81% - 70%
Completed Notebook.....	5%	D = 69% - 60%
Professionalism.....	5%	F = 59% or less

STUDENT PERFORMANCE ASSESSMENT METHODS AND GRADING PROCEDURES Continued:

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 ie. fit-up, weld profile, workmanship, etc. as prescribed by AWS standards and the instructions given at the time of the test.

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

Quizzes: 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: A compilation of class notes and handouts. To receive the full 5% the notebook must be neat and organized. It must also be contained or be found contiguous within a three ring binder.

Professionalism: Defined as a combination of one's attitude, motivation, participation, organization and willingness to maintain a clean work environment in the lab.

No make-up of written tests, written assignments or quizzes.

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. Disregard of safe practices, endangering yourself or others may result in you being denied access to the Lab area.
2. **Eye protection** is mandatory at all times in the Lab area.

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.umn.edu/SA/VPSA/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 as referred to at the beginning of the syllabus. Please be prepared to provide a letter from your DSS coordinator. For more information, visit the Disability Services website at <http://www.umn.edu/dss> or call 406-243-2243

REQUIRED TEXTBOOK: Welding Principles and Practices; Sachs and Bohnart, McGraw Hill. Fourth Edition.

SUGGESTED REFERENCE MATERIALS:

The Welding Journal, published monthly by the American Welding Society

SUPPLIES:

- Welding Helmet with #10 or #11 lens
- Welding Gloves
- Eye Protection
- Pliers with wire cutting capabilities
- Wire hand brush
- 4" or 4 1/2" right angle hand held grinder
- Upper body protection, leathers, coveralls or equivalent
- Lock for locker

COURSE OUTLINE:

- 1.0 Industrial Safety
 - 1.1 Electrical safety
 - 1.2 Dangers from arc radiation
 - 1.3 Burn treatment
 - 1.4 Dangers from general industrial machinery
- 2.0 FCAW and GMAW (metal core) equipment and consumables
 - 2.1 Theory of Flux Core Arc Welding (FCAW) and Gas Metal Arc Welding (GMAW)
 - 2.2 FCAW and GMAW equipment
 - 2.3 FCAW and GMAW consumables
- 3.0 Practical Arc welding-skill development
 - 3.1 FCAW - general electrodes, E71T-1(.030, .035,& .045) & E81T-1 (.030, .035,& .045)
 - 3.2 FCAW - E71T-1 (.030, .035,& .045) & E81T-1 (.030, .035,& .045)
 - 3.2.1 Fillets and groove welds in all positions, plate and structural
 - 3.3 GMAW (metal core) E70C-3, E70C-6
 - 3.3.1 Fillets welds in horizontal positions and flat position groove welds
 - 3.4 FCAW - E70T-4 (3/32)
 - 3.4.1 Fillets welds in horizontal positions for plate