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WLDG 245.01: Metal Fabrication Design and Contruction

Mark T. Raymond

University of Montana - Missoula, mark.raymond@mso.umt.edu

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

COURSE SYLLABUS

COURSE NUMBER AND TITLE: WLDG 245 Metal Fabrication Design and Construction

DATE REVISED: 2015

SEMESTER CREDITS: 4

PREREQUISITES: MPR 114T Related Metals Processes, MPR 214T Advanced Related Metals Processes; WLDG 117 Blueprint Reading and Welding Symbols, WLDG 150 Welding Layout Techniques, WLDG 180 Shielded Metal Arc Welding, WLDG 187 Flux Core Arc Welding, WLDG 215 Gas Tungsten Arc Welding, WLDG 275 Gas Metal 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):

A course that may be considered the capstone of the Welding Technology program and AAS degree. Students use skills and knowledge gained in all previous courses and apply that information here through application and comprehensive problem solving.

COURSE DESCRIPTION:

Students combine all knowledge and skills developed in the welding program to design and draw a full set of plans (blueprints) and to build an instructor-approved project using extensive welding, metal fabrication equipment, machining processes and automation. High quality performance, consistent with business and industry required.

STUDENT PERFORMANCE OUTCOMES:

Occupational Performance Objectives

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

1. Use technical terminology as it relates to welding based upon American Welding Society terms and definitions.
2. Demonstrate machine set-up for the successful welding of aluminum, stainless steel, carbon steel.
3. Demonstrate machine tool set-up/operation...press brake, optical tracer torch, lathe, milling machine, CNC mill, CNC lathe, and CNC plasma table, various welding machines, for the successful forming, machining & welding of metals.
4. Demonstrate the ability to plan, design and construct a project to industry standards. For graphic design and documentation, Autocad will be used.
5. Demonstrate fillet and groove welding to American Welding Society standards.
6. Complete written exams given covering metal fabrication with accumulative scores of 70% or better.

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:

Fabricated Project(s)	40%
Fabrication drawings using AUTOCAD	15%
Written exams	10%
Quizzes	10%
Lincoln Arc Welding Contest submission	20%
Professionalism	5%

Fabricated project(s): The student will design and fabricate an approved project. It will be evaluated based upon design, execution of that design, general fabrication, welding, workmanship, etc.

Fabrication drawings using AUTOCAD: The student's work is graded by 1)meeting required timelines presented in class, and 2)degree of excellence in the finished work as presented in class. Refer to the document "Required Elements for Fabrication II Drawings".

Written tests: these tests 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.

Lincoln Arc Welding Contest: A national contest in pursuit of excellence in design, execution and communication of ideas of an arc welded fabricated project.

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 class or lab area.

REQUIRED TEXTBOOKS:

Welding Principles and Practices, 3RD Edition; Sacks and Bohnart.

SUGGESTED REFERENCE MATERIALS:

The Welding Journal, monthly periodical published by the American Welding Society

AWS Welding Handbook, 8th edition, Volume 1-4

The Procedure Handbook of Arc Welding, 13th Ed.; Author: The Lincoln Electric Company;
Publisher: The Lincoln Electric Company

NOTE: The above reference materials are located at the College of Technology Library East Campus, 909 South Avenue West, Missoula, MT.

REQUIRED SUPPLIES:

1. Welding helmet
2. Lightweight welding gloves (GTAW)
3. SMA welding gloves
4. Eye protection
5. Pliers with wire cutting capabilities
6. Wire hand brush
7. Chipping hammer
8. Coveralls or equivalent
9. Lock for locker
10. 4 ½" or 5" hand held right angle grinder required
11. Minimum of \$100.00 for materials for fabrication project

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. Computer Aided Drafting / Design
2. Part processing, quality assessment
3. Layout, fit-up, assembly concepts
4. Processing / welding cost evaluation
5. Practical problem solving through student fabrication projects
6. Documentation of Fabrication (Lincoln Arc Welding Awards Contest)