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WLDG 285.01: Automation in Welding

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

COURSE SYLLABUS

COURSE NUMBER AND TITLE: WLDG 285 Automation in Welding

DATE REVISED: Spring 2016

SEMESTER CREDITS: 3

PREREQUISITES: WLDG 180 Shielded Metal Arc Welding, WLDG 187 Flux Cored Arc Welding, WLDG 145 Fabrication I, WLDG 150 Layout, WLDG 215 GTAW, CADX 110

COREQUISITE: WLDG 275 GMAW

Instructor: Zachary Reddig

E-Mail: Zachary.reddig@umontana.edu

(According to new Federal and UM policies I cannot answer any email that does not come from an official UM email address; no Hotmail, AOL, yahoo, gmail, etc.)

Phone: 243-7644

Office: Welding Lab Office

Office Hours: By appointment or as posted on Faculty office door.

COURSE DESCRIPTION:

Application of the welding process to automation. Examination of simple automation techniques such as tools, clamping and fixturing to aid in the rapid joining production runs. Increasing complexity is examined leading into equipment that carries the welding gun, tractors, and carriages to fully automated systems with the student performing set up and troubleshooting. (Submerged "Arc" Welding) and automated parts processing (PAC-CNC). The use of industrial robots studied.

STUDENT PERFORMANCE OUTCOMES:

Occupational Performance Objectives

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

1. Students will develop awareness of the advantages/disadvantages of automation.
2. Students will develop awareness of available equipment used in welding automation.
3. Students will develop an understanding of how to automate the welding process.
4. Students will develop an understanding of safe operation of various equipment used.

STUDENT PERFORMANCE ASSESSMENT METHODS AND GRADING PROCEDURES:

Grading Scale:

A= 100%- 90%
B= 89%- 80%
C= 79%- 70%
D= 69%- 60%
F= 59%- 0%

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

Grading Breakdown:

Lab Work	50%
Exams	30%
Quizzes	10%
Notebook	5%
Professionalism	5%

Automation Practical Welding Tests: Upon successful completion of lab assignments an automated welding test derived from lab assignments. It will be graded based upon execution of fit-up, weld profile, and finish as prescribed by AWS standards and how the automation of the welding process was integrated into the finished product.

Written Exams: These tests are derived from reading assignments given in class (homework), notes from class lectures and presentations. **No make-up exams will be allowed.**

Quizzes: Short impromptu tests given on reading assignments, demonstrations, lectures. Composed of student name/date and three questions. Name and date are worth 25%. Each question is worth 25%. To receive credit for questions the question must be written out and answered correctly. Quizzes may be given at anytime during the course scheduled meeting time. **No make-up quizzes will be allowed.**

Notebook: Compilation of class notes and handouts. To receive the full 5% credit, 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 attitude, motivation, participation, organization and work area cleanliness as demonstrated on a daily basis in the lab and classroom.

POLICIES:

- **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.**
- **Eye protection is mandatory at all times in the lab area.**
- **“Make up” exams or quizzes are not given for any reason**
- **Assignments will be docked 10% for each day it is turned in late after the due date.**
- **Cell phones are to be turned off during class time: no texting, calculations, or calls are to be done during class time.**
- **Any forms of cheating during exams or quizzes are an automatic 0.**
- **Students are expected and required to learn how access and navigate Moodle by the end of first week of instruction. These function as supplements to the course.**
- **Attendance is not taken, although you are required to be in attendance to successfully complete the course.**

REQUIRED TEXTBOOKS:

Welding Principles and Practices, 4th Edition; Sachs and Bohnart, McGraw Hill.

SUGGESTED REFERENCE MATERIALS:

American Welding Society Structural Welding Code; published monthly by AWS

REQUIRED SUPPLIES:

1. Welding Helmet with #10 or #11 lens

2. Lightweight Welding Gloves (GTAW)
3. Eye Protection
4. Pliers with wire-cutting capabilities
5. Full size "pipe" hand brush (has tapered grouping of bristles)
6. 4" or 4 1/2" right angle handheld grinder
7. Tape Measure
8. Striker
9. Upper body protection, leathers, coveralls or equivalent
10. Lock for locker
11. Chipping hammer

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.umd.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.umd.edu/dss/> or call 406.243.2243 (Voice/Text).

COURSE OUTLINE

1. General philosophy of welding codes.
2. Workmanship standards
3. Procedure Qualification
4. Performance Qualification
5. Preparation of materials for plate and pipe qualification
6. Plate qualification- AWS
7. Pipe certification-AWS/ASME as they relate
8. Practical Welding experience
9. Non-destructive testing of welds

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