ETME 311 WELDING PROCESSES
Fall 3 cr. LEC 1 LAB 2
Prerequisite: EMEC 103 or equivalent, or TE 230 for non-majors, or instructor approval.
Co Requisite: ETME 216.
-- Introduction to modern science of welding technology, as well as a detailed examination of metallurgy and materials properties as related to welding processes. Welding specification and symbols are introduced as well as modern welding code usage. Weld design, set-up, preparation, application, and test are emphasized. Specific hands-on experiences in OAW, SMAW, GMAW, GTAW, common separating processes, as well as destructive and non-destructive testing are included in laboratory. In addition to commonly used welding techniques this course will expose students to other fastening and joining techniques used in industry. Resistance welding, composites, riveting and mechanical fastening and their application will be explored.

TEXTBOOK & LABORATORY SUPPLIES:
Required Textbooks: Introduction to Manufacturing Processes by Wiley isbn 9780470632284
Laboratory Supplies:
1. OSHA approved clear safety glasses or impact resistant prescription glasses with side shields.
2. Laboratory notebook, three ring binder, graph paper.
3. No open toe shoes, no hoodies or loose clothing. You will get a little dirty! A shop coat or apron is appropriate.

COURSE WEBSITE:
All course content will be distributed through the Desire2Learn (D2L) system available from the following link: https://ecat.montana.edu/

INSTRUCTOR:
Assistant Teaching Professor: Tom Jungst,
Office: EPS 136B,
Phone: 994-6367,
tom.jungst@me.montana.edu
Office Hours: Posted on my office door or by appointment.

ENTRANCE EXPECTATIONS:
This course focuses on the fundamentals of material joining processes including welding. Safety is a priority and should never be compromised for any reason. In addition, the student is expected to bring to the class good knowledge of:

1. Interpreting dimensioned multi-view drawings.
2. Understanding of plasma cutting techniques.
4. Written and oral communication skills.
5. Problem solving skills.
**COURSE OBJECTIVE:**
The objective of this course is to provide the student with knowledge in the areas of welding safety and welding technique. Emphasis is on the application of various joining processes commonly encountered by engineers today. Operating and experiencing welding and joining in our lab section will give valuable insight into processes commonly found in industry today.

**CLASS SCHEDULE:**
Lecture: Wednesday 10:00 – 10:50 AM, Roberts Hall room 209
Laboratory: EPS 132
Section 002: Thursday and Friday 0900-1150

**COMPUTER AND LABORATORY USAGE:**
Students will be required to complete homework and laboratory assignments using basic software such as MS Office. All homework requiring a writing component must be typed.

**COURSE OUTCOMES:**
Upon completion of this course, the student will have demonstrated an understanding of:
1. How to identify and remediate unsafe work practices within a shop environment.
2. Welding operations with OAW, SMAW, GMAW, GTAW, operation of plasma tables and various joining processes.
3. Importing 2D models into plasma CAM software package operating the plasma table.
4. Inspection equipment used to inspect parts and test parts using the destructive testing equipment.

**SPECIAL NEEDS INFORMATION:**
Students with special needs or requiring special accommodations should contact the instructor or the campus Disabled Student Services Office at the earliest opportunity.

**STUDENT CONDUCT:**
Students are expected to conduct themselves in accordance with the MSU Student Conduct Guidelines (http://www2.montana.edu/policy/student_conduct/student_conduct_code.htm), including the area of academic honesty, behavior, and responsibilities.
ASSESSMENT & EVALUATION:
This course may be taken only for a letter grade. Course outcomes will be evaluated, and the final letter grades will be based on the following criteria:

1. Written & Oral Communication
   Homework assignments (10%)
2. Evaluation
   Midterm exam (20%)
   Final exam (20%)
3. Laboratory
   Exercises (50%)

Grade Distribution:
90 – 100% = A
80 – 89.9% = B
70 – 79.9% = C
60 – 69.9% = D
Below 60% = F
PLEASE NOTE: (Plus and minus grading will be used for borderline cases, within the typical grading ranges shown)

COURSE SCHEDULE:
Month Day Discussion Topic Assignment Due
Week 1 Course Overview Introduction to Joining course, lab facilities and safety.
Week 2 to 4 Arc welding basics.
Week 5 to 6 MIG and Plasma processes.
Week 7 Gas welding and oxy-acetylene use.
Week 8 Midterm exam and practical exam.
Week 9 to 11 TIG welding
Week 12 Riveting , upset joining and fasteners.
Week 13 Resistance welding.
Week 14 Plastic joining processes.
Week 15 Adhesive and composite joining.
Week 16 Final Exam