Faculty is required to have the outline submitted to the Academic Affairs Office. The course outline is the form used for approval of new courses by the Academic Affairs and Standards Council.

DEPT.  WELD                          COURSE NUMBER: WELD 1330

NUMBER OF CREDITS:  4 Credits   (0/4)

COURSE TITLE:  Advanced Gas Tungsten Arc

CATALOG DESCRIPTION: Evaluate advanced procedures, techniques, and skills necessary for proficient Gas Tungsten Arc Welding (GTAW) in a variety of positions and joint designs using different types of metals and thicknesses of metals used by industry to AWS and ASME standards.

AUDIENCE: Secondary and post-secondary students interested in welding as a career.

FULFILLS MN TRANSFER CURRICULUM AREA(S) (Leave blank if not applicable)
Area:  N/A  by meeting the following competencies:
Area:  N/A  by meeting the following competencies:
Area:  N/A  by meeting the following competencies:

PREREQUISITES OR NECESSARY ENTRY SKILLS/KNOWLEDGE:

LENGTH OF COURSE: 1 semester  (4 credits) 0 lec./4 lab

THIS COURSE IS USUALLY OFFERED:
Every other year ☐  fall ☒  spring ☒  summer ☐  undetermined ☐

Four goals are emphasized in course at Minnesota West Community & Technical College:

1) ACADE ACADEMIC CONTENT: The academic objectives of this course are:
   a. Reading for understanding, standards and codes for welding
   b. Evaluating welds for compliance with standards and codes

2) THINKING SKILLS: This course will help students improve the effectiveness of their thinking skills through:
   a. Completing Homework
   b. Participating in Classroom discussions
   c. Taking open and closed book tests and quizzes
   d. Critical thinking

3) COMMUNICATIONS SKILLS: This course will help students improve their oral and written communication skills through:
   a. Participating in class discussions and reports
b. Participating in assignments. Worksheets, and reports

4) HUMAN DIVERSITY: This course will help students recognize, understand, and appreciate human diversity through:
   a. Working with students of other cultures
   b. Working with students of another gender

TOPICS TO BE COVERED:
Applications where gas tungsten arc welding is commonly used
Torch angles effect on the weld
Importance of keeping the filler rod end inside the protective zone of the shielding gas
Disadvantages of welding with a contaminated tungsten electrode
Correct machine settings for the minimum and maximum current, types and sizes of tungsten, metal types and thicknesses
Factors the affect the gas pre-flow and post-flow required to protect the electrode and the weld
Determine the minimum and maximum gas flow settings for each nozzle size, tungsten size and amperage setting
Comparing the characteristics of low-carbon and mild steels, stainless steel and aluminum for GTA welding
Preparation of carbon steel, stainless steel and aluminum for GTA welding

LIST OF EXPECTED COURSE OUTCOMES:
The student will:
  Prepare time or job cards, reports or records
  Follow verbal and written instructions to complete work assignments
  Demonstrate proper use and inspection of personal protective equipment
  Demonstrate safe working practices in the work area
  Understand precautionary labeling and MSDS information
  Demonstrate proper inspection and operation of equipment for each elding or thermal cutting process
  Set up and operate GTAW equipment on carbon steel
  Make Groove welds, in all positions on carbon steel
  Pass GTAW performance qualification test (workmanship sample) on carbon steel
  Set up and operate GTAW equipment on stainless steel
  Make GTAW fillet welds, in 1F, 2F, and 3F positions on stainless steel
  Make GTAW groove welds, in 1G and 2G positions on stainless steel
  Pass GTAW welder performance qualification test (workmanship sample) on stainless steel
  Set up and operate GTAW equipment on aluminum
  Make GTAW fillet welds in the 1F and 2F positions on aluminum
  Make GTAW groove welds in the 1G position on aluminum
  Pass GTAW welder performance qualification test (workmanship sample) on aluminum
  Examine cut surfaces and edges of prepared base metal parts
  Examine tacks, root passes, intermediate layers and completed welds
LEARNING/TEACHING TECHNIQUES used in the course are:

- [ ] Collaborative Learning
- [ ] Problem Solving
- [x] Student Presentations
- [ ] Interactive Lectures
- [ ] Creative Projects
- [x] Individual Coaching
- [x] Lecture
- [x] Films/Videos/Slides
- [ ] Demonstrations
- [ ] Other (describe below)
- [x] Lab

ASSIGNMENTS AND ASSESSMENTS FOR THIS CLASS INCLUDE:

- [x] Reading
- [ ] Tests
- [x] Individual Projects
- [ ] Oral Presentations
- [x] Worksheets
- [ ] Collaborative Projects
- [ ] Textbook Problems
- [ ] Papers
- [ ] Portfolio
- [ ] Group Problems
- [x] Term Paper
- [ ] Other (describe below)

EXPECTED STUDENT LEARNING OUTCOMES:

- Have a technical understanding of the FCAW process
- Be able to demonstrate safe and proper use of FCAW equipment and components
- Perform quality welds in all positions

Veteran Services: Minnesota West is dedicated to assisting veterans and eligible family members in achieving their educational goals efficiently. Active duty and reserve/guard military members should advise their instructor of all regularly scheduled military appointments and duties that conflict with scheduled course requirements. Instructors will make every effort to work with the student to identify adjusted timelines. If you are a veteran, please contact the Minnesota West Veterans Service Office.

The information in this course outline is subject to revision

To receive reasonable accommodations for a documented disability, please contact the campus Student Services Advisor or campus Disability Coordinator as arrangements must be made in advance. In addition, students are encouraged to notify their instructor.

This document is available in alternative formats to individuals with disabilities by contacting the Student Services Advisor or by calling 800-658-2330 or via your preferred Telecommunications Relay Service.

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