WELD 012A: INTRODUCTION TO GAS METAL ARC WELDING

Originator
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Justification / Rationale
To align with AWS SENSE and create a sequence of courses that lead to an entry-level welder certificate demonstrating proficiency in welding and providing career options for students.

Effective Term
Fall 2020

Credit Status
Credit - Degree Applicable

Subject
WELD - Welding

Course Number
012A

Full Course Title
Introduction to Gas Metal Arc Welding

Short Title
INTRO GMAW WELD

Discipline

Disciplines List
Welding

Modality
Face-to-Face

Catalog Description
This course covers basic or beginning level GMAW welding. This course includes safe work practices, safety in the welding industry, welding equipment selection, beginning technical drawings used in the welding industry, measuring and cutting, the five basic welds, and thermal cutting processes including OFC and Plasma. Students will demonstrate the ability to weld the five basic welds (Butt, Lap, Outside corner, Tee, and Edge) in the horizontal and flat positions using the GMAW Process.

Schedule Description
Students are introduced to the safe and efficient practices of GMAW welding.

Lecture Units
1

Lecture Semester Hours
18

Lab Units
1

Lab Semester Hours
54

In-class Hours
72

Out-of-class Hours
36

Total Course Units
2

Total Semester Hours
108

Required Text and Other Instructional Materials

Resource Type
Book

Author
Jeffus, Larry

Title
Welding: Principles and Applications

Edition
8th

Publisher
Cengage Learning

Year
2016

College Level
Yes

Flesch-Kincaid Level
12

ISBN #
978-1305494695

Class Size Maximum
25

Course Content

- Classroom introduction of the following:
  - Sources of electricity for welding
  - The welding circuit
  - Proper grounding
  - Fundamentals of arc welding
  - Stringer beads
  - Weave beads
  - Multi-pass welds
  - Joint preparation
  - Setup of GMAW welding machine
  - Safe working practices using cutting and welding tools
  - Safe use cut-off saw
  - Safe use of grinder for grinding and cutting
  - Plasma cutting
  - Oxy/acetylene cutting

Lab Content

- Lab demonstration and practice of the following:
  - Butt welds in the flat position
  - Butt welds in the horizontal position
  - Lap welds in the flat position
  - Lap welds in the horizontal position
  - Outside corner welds in the flat position
  - Outside corner welds in the horizontal position
  - T welds in the flat position
  - T welds in the horizontal position
  - Edge welds in the flat position
  - Edge welds in the horizontal position

Course Objectives

	Objectives
Objective 1	Explain how each of the major welding processes works and list the factors that must be considered before a welding process is selected.
Objective 2	Use personal protective equipment purposed for welders and evaluate the types of injuries that can occur and methods to prevent injuries.
Objective 3	Integrate the proper use and maintenance of tools and equipment.
Objective 4	Using GMAW equipment, demonstrate proper setup, voltage and wire-feed settings, and use equipment to make a proper GMAW weld for a given weldment.
Objective 5	Evaluate how the GMAW molten weld pool can be controlled by varying the shielding gas, power settings, weave pattern, travel speed, electrode extension, gun angle, and the backhand and forehand welding techniques.
Objective 6	Define voltage, electrical potential, amperage, and electrical current as it applies to GMAW.
Objective 7	Demonstrate how to make each of the five basic welds using the GMAW process in both the flat and horizontal positions.
Objective 8	Using a set of drawings and determine each item shown, its dimensioning, and why a drawing may be scaled, including the major parts of a weld symbol.

Student Learning Outcomes

	Upon satisfactory completion of this course, students will be able to:
Outcome 1	Accurately measure, cut, and fit metal to prepare it for welding.
Outcome 2	Demonstrate proper welding techniques for all of the five basic welds using GMAW equipment in the flat and horizontal positions.

Methods of Instruction

Method	Please provide a description or examples of how each instructional method will be used in this course.
Skilled Practice at a Workstation	Students are given assigned projects with accompanying technical drawings. The instructor assists students with symbols and other questions on the technical drawings. Students are expected to cut and prepare metal and to provide a good fit-up prior to final welding.
Lecture	The instructor uses Google Slides to provide direct instruction at the beginning of the scheduled class.
Self-exploration	Students are expected to read assigned chapters, answer chapter review questions, and be prepared for mid-term and final exams.
Discussion	During direct discussion, students are asked questions and discussion is encouraged.

Methods of Evaluation

Method	Please provide a description or examples of how each evaluation method will be used in this course.	Type of Assignment
Written homework	Chapter reviews will be assessed by the instructor.	Out of Class Only
Laboratory projects	Student work samples are self-assessed and then are assessed by the instructor.	In Class Only
Presentations/student demonstration observations	Skill demonstration – lab work. Students will be assigned a series of shop projects to be completed in the shop.	In Class Only
Mid-term and final evaluations	Both mid-term and final are in multiple choice format.	In Class Only
Student participation/contribution	Welding reflection packet and instructor evaluation. Students are expected to display good work habits, punctuality, and clean-up procedures.	In Class Only
Other	Participation.	In Class Only

Assignments

Other In-class Assignments

1. Class discussion
2. Group interaction and presentation
3. Display proper work habits in shop
4. Display soft skills

Other Out-of-class Assignments

1. Reading assignments
2. Chapter review questions
3. Students are encouraged to find opportunities outside of class time to research PPE and to practice welding to increase proficiency.

Grade Methods

Letter Grade Only

MIS Course Data

CIP Code

48.0508 - Welding Technology/Welder.

TOP Code

095650 - Welding Technology

SAM Code

C - Clearly Occupational

Basic Skills Status

Not Basic Skills

Prior College Level

Not applicable

Cooperative Work Experience

Not a Coop Course

Course Classification Status

Credit Course

Approved Special Class

Not special class

Noncredit Category
Not Applicable, Credit Course

Funding Agency Category
Not Applicable

Program Status
Program Applicable

Transfer Status
Not transferable

Allow Audit
No

Repeatability
No

Materials Fee
No

Additional Fees?
No

Files Uploaded

Attach relevant documents (example: Advisory Committee or Department Minutes)
Welding_Occupations_in_the_Inland_Empire Aug2018.pdf

Approvals

Curriculum Committee Approval Date
9/03/2019

Academic Senate Approval Date
9/12/2019

Board of Trustees Approval Date
10/31/2019

Chancellor's Office Approval Date
12/02/2019

Course Control Number
CCC000609545

Programs referencing this course
Automotive Air Conditioning Certificate of Achievement (http://catalog.collegeofthedesert.eduundefined?key=104/)
Automotive Braking Systems Certificate of Achievement (http://catalog.collegeofthedesert.eduundefined?key=109/)
Automotive Steering, Suspension, Alignment Certificate of Achievement (http://catalog.collegeofthedesert.eduundefined?key=112/)
Gas Metal Arc Welding Certificate (http://catalog.collegeofthedesert.eduundefined?key=233/)
Welding Technology SENSE Entry-Level Welder Certificate of Achievement (http://catalog.collegeofthedesert.eduundefined?key=235/)