

WELD 312B: INTERMEDIATE GAS METAL ARC WELDING

New Course Proposal

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Originator

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Justification / Rationale

Noncredit mirror of WELD 012B. WELD 312A, WELD 312B and WELD 312C will provide a short term vocational program leading to employment opportunities as Gas Metal Arc (GMAW) welders.

Effective Term

Spring 2021

Credit Status

Noncredit

Subject

WELD - Welding

Course Number

312B

Full Course Title

Intermediate Gas Metal Arc Welding

Short Title

INTERM GMAW WELDING

Discipline

Disciplines List

Welding

Modality

Face-to-Face

Catalog Description

This course covers intermediate level Gas Metal Arc Welding (GMAW). This course includes safe work practices, safety in the welding industry, Computer Numerical Control (CNC) plasma cutting processes, and the four positions of welding (Horizontal, Flat, Vertical, and Overhead). Students will demonstrate the ability to select the proper machine and settings and to perform the five basic welds in the four welding positions.

Schedule Description

Intermediate Gas Metal Arc Welding (GMAW). Emphasis on vertical position. Prerequisite: WELD 312A or WELD 012A.

Non-credit Hours

108

Lecture Units

0

Lab Units

0

In-class Hours

72

Out-of-class Hours

36

Total Course Units

0

Total Semester Hours

108

Override Description

Noncredit override to mirror total class hours of WELD 012B.

Prerequisite Course(s)

WELD 312A or WELD 012A

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

Entrance Skills

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.

Requisite Course Objectives

WELD 012A-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.

WELD 312A-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.

Entrance Skills

Explain how each of the major welding processes works and list the factors that must be considered before a welding process is selected.

Requisite Course Objectives

WELD 012A-Explain how each of the major welding processes works and list the factors that must be considered before a welding process is selected.

WELD 312A-Explain how each of the major welding processes works and list the factors that must be considered before a welding process is selected.

Entrance Skills

Use personal protective equipment purposed for welders and evaluate the types of injuries that can occur and methods to prevent injuries.

Requisite Course Objectives

WELD 012A-Use personal protective equipment purposed for welders and evaluate the types of injuries that can occur and methods to prevent injuries.

WELD 312A-Use personal protective equipment purposed for welders and evaluate the types of injuries that can occur and methods to prevent injuries.

Entrance Skills

Using GMAW equipment, demonstrate proper setup, voltage and wire-feed settings, and use equipment to make a proper GMAW weld for a given weldment.

Requisite Course Objectives

WELD 012A-Using GMAW equipment, demonstrate proper setup, voltage and wire-feed settings, and use equipment to make a proper GMAW weld for a given weldment.

WELD 312A-Using GMAW equipment, demonstrate proper setup, voltage and wire-feed settings, and use equipment to make a proper GMAW weld for a given weldment.

Entrance Skills

Demonstrate how to make each of the five basic welds using the GMAW process in both the flat and horizontal positions.

Requisite Course Objectives

WELD 012A-Demonstrate how to make each of the five basic welds using the GMAW process in both the flat and horizontal positions.

WELD 312A-Demonstrate how to make each of the five basic welds using the GMAW process in both the flat and horizontal positions.

Entrance Skills

Use 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.

Requisite Course Objectives

WELD 012A-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.

WELD 312A-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.

Course Content

Classroom introduction of the following:

- FCAW Welding
- Fabrication techniques
- 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
- Oxyacetylene cutting

Course Objectives

	Objectives
Objective 1	Explain the various cutting processes, safety considerations of each of the different cutting processes and compare the advantages of using each of the different cutting processes.
Objective 2	Explain the advantages of FCAW welding and evaluate its limitations.
Objective 3	Compare common shielding gases used in the GMAW process and choose the appropriate shielding gas for a particular weldment.
Objective 4	Evaluate how changing the welding gun angle affects the weld produced.
Objective 5	Explain weld porosity and determine how it can be prevented.
Objective 6	Demonstrate how to grind a tack weld and starts and stops to a featheredge.
Objective 7	Explain the acceptable criteria of a visual inspection of a pipe weld.
Objective 8	Demonstrate the ability to make a root pass, filler pass, and cover pass welds using GMAW, FCAW-G, and FCAW-S processes.
Objective 9	Modify parts to meet tolerance specifications called for in technical drawings, demonstrate how to assemble and fit up parts for welding, and estimate the advantage of custom welding parts.
Objective 10	Demonstrate and compare different methods of controlling heat distortion.

Student Learning Outcomes

	Upon satisfactory completion of this course, students will be able to:
Outcome 1	Demonstrate proper welding techniques using GMAW welding equipment in all four positions with an emphasis on the vertical position.
Outcome 2	Demonstrate fabrication techniques including measuring, bending, cutting, metal preparation, metallurgy and the properties of different metals, and the importance of proper fit-up of weldments based on technical drawings.

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.

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 are assessed by the instructor.	Out of Class Only
Laboratory projects	Student work samples are self-assessed and are then 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
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Other	Participation	In Class Only
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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: Students are required to read four selected chapters from the textbook and to answer chapter review questions for each chapter.
2. Students are expected to use the materials from their chapter review work to study and prepare for mid-term and final tests.
3. Students are encouraged to find opportunities outside of class time to practice welding techniques.

Grade Methods

Pass/No Pass 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

Other Non-credit Enhanced Funding

Approved Special Class

Not special class

Noncredit Category

Short-Term Vocational

Funding Agency Category

Not Applicable

Program Status

Program Applicable

Transfer Status

Not transferable

General Education Status

Not applicable

Support Course Status

Course is not a support course

Allow Audit

No

Repeatability

Yes

Repeatability Limit

NC

Repeat Type

Noncredit

Justification

Noncredit courses are repeatable until students have achieved the objectives and outcomes of the course.

Materials Fee

No

Additional Fees?

No

Approvals**Curriculum Committee Approval Date**

3/3/2020

Academic Senate Approval Date

3/12/2020

Board of Trustees Approval Date

5/15/2020

Chancellor's Office Approval Date

7/16/2020

Course Control Number

CC000618922

Programs referencing this course

Gas Metal Arc Welding Certificate of Completion (<http://catalog.collegeofthedesert.eduundefined?key=317/>)