WELD121 : Occupational Welding I

General Information

Author:	• Curtis G Potter
Course Code (CB01) :	WELD121
Course Title (CB02) :	Occupational Welding I
Department:	WELD
Proposal Start:	Spring 2025
TOP Code (CB03) :	(0956.50) Welding Technology
CIP Code:	(48.0508) Welding Technology/Welder.
SAM Code (CB09) :	Possibly Occupational
Distance Education Approved:	No
Will this course be taught asynchronously?:	No
Course Control Number (CB00) :	CCC000548748
Curriculum Committee Approval Date:	05/22/2024
Board of Trustees Approval Date:	07/16/2024
Last Cyclical Review Date:	05/22/2024
Course Description and Course Note:	WELD 121 is the first in a series of occupational welding courses designed to prepare the student for employment in the welding industry. It covers the theory of welding processes, welding safety, terms, basic metallurgy, and the fundamentals of shielded metal arc welding (SMAW) and oxyacetylene welding.
Justification:	Mandatory Revision
Academic Career:	• Credit
Mode of Delivery:	
Author:	Curtis G Potter
Course Family:	

Academic Senate Discipline

Primary Discipline:	• Welding
Alternate Discipline:	No value
Alternate Discipline:	No value

Course Development

Basic Skill Status (CB08)

Course is not a basic skills course.

☐ Allow Students to Gain Credit by Exam/Challenge

Course Special Class Status (CB13)

Course is not a special class.

Pre-Collegiate Level (CB21)

Not applicable.

Grading Basis

- Grade with Pass / No-Pass Option

Course Support Course Status (CB26)

Course is not a support course

General Education and C-ID

General Education Status (CB25)

Not Applicable

Transferability

Transferable to CSU only

Transferability Status

Approved

Units and Hours

Summary

Minimum Credit Units (CB07)	3
Maximum Credit Units (CB06)	3
Total Course In-Class (Contact) Hours	126
Total Course Out-of-Class Hours	36
Total Student Learning Hours	162

Credit / Non-Credit Options

Course Type (CB04)

Credit - Degree Applicable

Noncredit Course Category (CB22)

Credit Course.

Noncredit Special Characteristics

No Value

Course Classification Code (CB11)

Credit Course.

☐ Variable Credit Course

Funding Agency Category (CB23)

Not Applicable.

☐ Cooperative Work Experience Education Status (CB10)

Weekly Student Hours

	In Class	Out of Class
Lecture Hours	1	2
Laboratory Hours	6	0
Studio Hours	0	0

Course Student Hours

Course Duration (Weeks)	18
Hours per unit divisor	0
Course In-Class (Contact) Hours	
Lecture	18
Laboratory	108
Studio	0

Total	126

Course Out-of-Class Hours

Lecture	36
Laboratory	0
Studio	0
Total	36

Time Commitment Notes for Students

No value

Units and Hours - Weekly Specialty Hours

Activity Name	Type	In Class	Out of Class
No Value	No Value	No Value	No Value

Pre-requisites, Co-requisites, Anti-requisites and Advisories

Advisory

ENGL101 - Introduction to College Reading and Composition

Objectives

- Read, analyze, and evaluate a variety of primarily non-fiction readings for content, context, and rhetorical merit with consideration of tone, audience, and purpose.
- Integrate the ideas of others through paraphrasing, summarizing, and quoting without plagiarism.

OR

Advisory

ESL141 - Grammar And Writing IV

Objectives

- Compose a 400 to 450-word thesis-based essay which: (a) summarizes and cites appropriately a reading passage provided as a prompt, (b)includes a clear thesis statement, (c) uses evidence to support the thesis, (d) shows clear organization into an introduction, body, and conclusion, and (e) uses appropriate rhetorical modes such as comparison/contrast, cause/effect, and persuasion in order to support a thesis.

Entry Standards

Entry Standards

Course Limitations

Cross Listed or Equivalent Course

Specifications

Methods of Instruction

Methods of Instruction	Lecture
Methods of Instruction	Laboratory
Methods of Instruction	Guest Speakers
Methods of Instruction	Multimedia
Methods of Instruction	Demonstrations

Out of Class Assignments

- Write an essay describing the process used to complete the final project
- Final project (welding beads using oxygen acetylene welding)
- Homework written assignments

Methods of Evaluation	Rationale
Exam/Quiz/Test	Quizzes
Exam/Quiz/Test	Examination at the end of each instructional mode
Exam/Quiz/Test	Final examination
Exam/Quiz/Test	Final project (e.g. flat butt fusion weld with filler rod using oxygen acetylene welding)

Textbook Rationale

No Value

Textbooks

Author	Title	Publisher	Date	ISBN
Bowditch, William A.	Welding Fundamentals	Goodheart-Willcox	2022	978-1-64564-693-8

Other Instructional Materials (i.e. OER, handouts)

No Value

Materials Fee

No value

Learning Outcomes and Objectives

Course Objectives

Perform manipulative skills in oxy-fuel welding, cutting, brazing, and shielded metal arc welding, and plasma arc cutting.

Demonstrate a working knowledge of oxy-fuel, welding and cutting equipment, shielded metal arc welding equipment, plasma arc cutting equipment and their theories.

Critique and evaluate weldments after properly performing a series of destructive tests on the samples.

Demonstrate proper safety precautions in the use of oil oxy-fuel and shielded metal arc welding equipment.

Write and compile a general welding notebook to be used as a reference guide for related classes.

Show a general knowledge of basic metallurgy, welding terms and metal identification.

SLOs

Demonstrate and use practical knowledge of working safely with others using personal protective equipment.

Expected Outcome Performance: 70.0

ILOs Core ILOs	Analyze and solve problems using critical, logical, and creative thinking; ask questions, pursue a line of inquiry, and derive conclusions; cultivate creativity that leads to innovative ideas.
	Demonstrate depth of knowledge in a course, discipline, or vocation by applying practical knowledge, skills, abilities, theories, or methodologies to solve unique problems.
WELD Welding - A.S. Degree Major	complete introductory and advanced level welding projects using various techniques and procedures.

WELD Welding - Certificate	complete introductory and advanced level welding projects using various techniques and procedures.

Demonstrate a working knowledge of oxy-fuel welding and cutting. Expected Outcome Performance: 70.0

ILOs Core ILOs	Demonstrate depth of knowledge in a course, discipline, or vocation by applying practical knowledge, skills, abilities, theories, or methodologies to solve unique problems.
WELD Welding - A.S. Degree Major	complete introductory and advanced level welding projects using various techniques and procedures.
WELD Welding - Certificate	complete introductory and advanced level welding projects using various techniques and procedures.

Perform multiple welding techniques in oxy-fuel and ARC/MIG processes using class exercises for completion.
Expected Outcome Performance: 70.0

ILOs Core ILOs	Demonstrate depth of knowledge in a course, discipline, or vocation by applying practical knowledge, skills, abilities, theories, or methodologies to solve unique problems.
WELD Welding - A.S. Degree Major	complete introductory and advanced level welding projects using various techniques and procedures.
WELD Welding - Certificate	complete introductory and advanced level welding projects using various techniques and procedures.

Additional SLO Information

Does this proposal include revisions that might improve student attainment of course learning outcomes?

No

Is this proposal submitted in response to learning outcomes assessment data?

No

If yes was selected in either of the above questions for learning outcomes, explain and attach evidence of discussions about learning outcomes.

No Value

SLO Evidence

No Value

Course Content

Lecture Content

Methods of Welding (2 hours)

Welding Terms (2 hours)

Basic Welding Design and Application (2 hours)
- Welding joints
- Applications

Common Metals Identification (6 hours)
- Identifying procedures
- testing metals

Basic Metallurgy (4 hours)

- Physical properties of metals
- Annealing and stress relief
- Tempering
- Work hardening
- Effects of alloying
- Classification of steels
- Classification of aluminum

Welding Safety (2 hours)
- Hazards
- Clothing and equipment

Total hours: 18

Laboratory/Studio Content

Oxyacetylene Welding and Brazing (30 hours)
- O/A safety in setting up equipment
- O/A definitions and procedures
- Flame types and uses
- Regulators, torch maintenance
- Welding rods: types, alloys
- Common defects: inclusions, blowholes, porosity
- Flat position welding:
    - Running a puddle bead
    - Welding edge and cover joints on 16 ga. Material
    - Running a bead with a filler rod
    - Butt, tee and lap joints using a filler rod
- Vertical position welding of butt, tee, and lap joints on 16 ga. Material Brazing:
    - Preparing the base metal
    - Laying a bronze bead on plate
    - Brazing a butt, tee, and lap joints

Oxyacetylene Cutting Theory and Practice (4 hours)
- Setting up equipment for manual and automatic flame cutting
- Manual flame cutting
- Automatic flame cutting

Metallic Arc Welding (60 hours)
- Definitions and classification of arch welding
- Safety hazards
- Machines and accessories
    - Transformers
    - Rectifiers
    - Transformer/Rectifier
- Electrode selection
    - A.W.S. classification code
    - Characteristics of electrodes
    - Identification and N.E.M.A. color code
- Selection of polarity of current
    - AC
    - DC positive or negative
- Problems encountered
    - Arc blow
    - Inclusions
    - Porosity
    - Gas pockets
    - Cracking
- Preparation of work
    - Joint design
    - Types of joints
    - Welding positions

Arc Welding in Various Positions (14 hours)
- Using electrodes E6010, E6013, E7018, E7024
- Striking an arc
- Running a bead on flat plate
- Building up a pad
- Butt, fillet, vee groove welding
- Guided band testing, tensile testing, cutting coupons

Total hours: 108

Additional Information

Is this course proposed for GCC Major or General Education Graduation requirement? If yes, indicate which requirement in the two areas provided below.

No

GCC Major Requirements

No Value

GCC General Education Graduation Requirements

No Value

Repeatability

Not Repeatable

Justification (if repeatable was chosen above)

No Value

Resources

Did you contact your departmental library liaison?

Yes

If yes, who is your departmental library liason?

Adina Lerner (Technology & Aviation, Visual & Performing Arts)

Did you contact the DEIA liaison?

Yes

Were there any DEIA changes made to this outline?

No

If yes, in what areas were these changes made:

No Value

Will any additional resources be needed for this course? (Click all that apply)

- No

If additional resources are needed, add a brief description and cost in the box provided.

No Value