

West Hills College Coalinga CTE Program Endorsement Welding Technology

Appropriateness to Mission

Statement of Program Goals and Objectives

The Welding Technology program prepares students for careers in certified welding of structural steel or pipe with SMAW (Shielded Metal Arc Welding), FCAW (Flux Core Arc Welding), and GMAW (Gas Metal Arc Welding). The curriculum is designed to align with the National Center for Construction Education and Research (NCCER) certification, American Welding Society (AWS) certification, and/or American Society of Mechanical Engineers (ASME) certification. Completion of the certificate qualifies students to enter the professional job market.

Upon completion of the course the student will be able to meet the following objectives:

- A. identify hazards and perform safe welding and shop practices including proper PPE;
- B. identify and explain material safety data sheets and storing and handling cylinders safely;
- C. explain and perform oxyfuel, plasma arc and air carbon arc cutting;
- D. understand codes governing welding;
- E. understand welder qualification tests including weld imperfections and their causes and nondestructive and destructive testing;
- F. understand and execute safe SMAW practices;
- G. identify tools for weld cleaning;
- H. identify factors that affect electrode selection;
- I. explain AWS and ASME filler metal classification systems and identify different types of filler metals;
- J. select proper electrodes for a specific welding task;
- K. make stringer, weave and overlapping beads;
- L. perform fillet welds in horizontal, vertical and overhead positions;
- M. identify and explain groove welds;
- N. identify and explain groove welds with backing;
- O. setup and operate SMAW equipment for making V-groove welds;
- P. perform SMAW for V-groove welds with backing in the Flat (1G), Horizontal (2G), Vertical (3G), and Overhead (4G) positions;
- Q. read welding symbols on drawings, specifications, and welding procedure specifications;
- R. identify and explain a welding detail drawings;
- S. identify and explain dimensioning;
- T. create and understand a bill of materials;
- U. understand the classification and demonstrate field identification methods for base metals;
- V. identify forms and shapes of structural metals;

- W. explain metallurgical consideration for welding materials;
- X. demonstrate preheating metals, maintaining interpass temperature and post-weld heat treatment.

Catalog Description

The Welding Technology program is a Certificate of Achievement program designed to prepare students for a career in welding. Program performance standards for certification will be in accordance with those set forth by the National Center for Construction and Research (NCCER), the American Welding Society (AWS), and the American Society of Mechanical Engineers (ASME). Career opportunities for certified welders exist in oil production and maintenance, agriculture, fabrication, manufacturing and construction. Laboratory work is completed in a modern and well equipped welding shop.

Program student learning outcomes:

- Students will demonstrate preheating metals, maintaining interpass temperature and post-weld heat treatment.
- Students will demonstrate proper SMAW V-groove welds with backing in the Flat (1G), Horizontal (2G), Vertical (3G), and Overhead (4G) positions.
- Students will demonstrate proper fillet welds in horizontal, vertical and overhead positions.
- Students will demonstrate safe SMAW practices.
- Students will identify hazards and demonstrate safe welding and shop practices including proper PPE.

Program Requirements

Course #	Title	Units
IMT 60	Industrial Core	3
WT 70	Introduction to Certified Welding	2.5
WT 71	Beginning SMAW	3
WT 72	Advanced SMAW	3
WT 73	Introduction to Metallurgy and Weld Symbols	1.5
WT 74	GMAW and FCAW: Plate	3
WT 75	SMAW Pipe Welding.....	<u>2</u>
WT 76	Welding Certification Preparation.....	<u>0.5</u>
	Total.....	18.5

Background and Rationale

Welding is a diverse industry with a tremendous variety of career opportunities. Students that successfully complete the Welding Technology program requirements and associated certifications will have the safety, cutting, and welding skills necessary to obtain entry level employment. With the increase in the amount of retirees, the demand for certified welders increases. Career opportunities exist in oil production and maintenance, agriculture, fabrication, manufacturing and construction.

Curriculum Standards

Display of Proposed Sequence

Fall Semester

IMT 60

WT 70

WT 71

WT 72

Spring Semester

WT 73

WT 74

WT 75

WT 76

Transfer Applicability (if applicable)

N/A

Need for Program

Enrollment and Completer Projections

Courses in the new program will be offered by Agriculture faculty. Students will be recruited from high school and existing precision agriculture, maintenance mechanic, heavy equipment and rodeo programs. Once fully implemented, approximately 15 students are expected to complete the certificate program every two years.

These numbers are based on the estimates of enrollment of similar certificate programs with adjustments made for college size and course offering schedule. It is anticipated that these numbers will remain constant year to year based on the experience of other colleges in the state.

Approximately 20 students will be enrolled in each course.

Place of Program in Curriculum/Similar Programs

This program is a new program at WHCC and will be offered in conjunction with other vocational and agriculture programs offered at the Farm of the Future.

Similar Programs at Other Colleges in Service Area

There are no similar programs within our service area, as West Hills College Lemoore does not have a similar program.

Labor Market Information and Analysis

The following SOC codes were used for employment: First-Line Supervisors of Construction Trades and Extraction Workers (47-1011); Plumbers, Pipefitters, and Steamfitters (47-2152); Sheet Metal Workers (47-2211); Structural Iron and Steel Workers (47-2221); First-Line Supervisors of Mechanics, Installers, and Repairers (49-1011); First-Line Supervisors of Production and Operation Workers (51-1011); Structural Metal Fabricators and Fitters (51-2041); Welders, Cutters, Solderers, and Brazers (51-4121); Welders, Soldering, and Brazing Machine Setters, Operators, and Tenders (51-4122).

SOC	Description	2013 Jobs	2016 Jobs	Change	% Change	Replacements	Openings	Annual Openings
47-1011	First-Line Supervisors of Construction Trades and Extraction Workers	5,055	5,252	197	4%	311	508	169
47-2152	Plumbers, Pipefitters, and Steamfitters	2,916	3,176	260	9%	141	401	134
47-2211	Sheet Metal Workers	965	986	21	2%	75	96	32
47-2221	Structural Iron and Steel Workers	512	538	26	5%	77	103	34
49-1011	First-Line Supervisors of Mechanics, Installers, and Repairers	4,444	4,658	214	5%	380	594	198
51-1011	First-Line Supervisors of Production and Operating Workers	5,165	5,308	143	3%	259	402	134
51-2041	Structural Metal Fabricators and Fitters	692	683	(9)	(1%)	104	104	35
51-4121	Welders, Cutters, Solderers, and Brazers	3,672	3,842	170	5%	319	489	163
51-4122	Welding, Soldering, and Brazing Machine Setters, Operators, and Tenders	316	334	18	6%	26	44	15
Total								914

Data provided by Jenni Abbott, Technical Assistant Provider, Center of Excellence Labor Market Research

Employer Survey

SOC	Description	Annual Openings	Pct 10 Hourly Earnings	10th Percentile Annual	Median Hourly Earnings	Median Annual Wages
47-1011	First-Line Supervisors of Construction Trades and Extraction Workers	169	\$17.09	\$35,547	\$27.15	\$56,472
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49-1011	First-Line Supervisors of Mechanics, Installers, and Repairers	198	\$18.25	\$37,960	\$29.88	\$62,150
51-1011	First-Line Supervisors of Production and Operating Workers	134	\$15.57	\$32,386	\$24.79	\$51,563
51-2041	Structural Metal Fabricators and Fitters	35	\$12.76	\$26,541	\$18.45	\$38,376
51-4121	Welders, Cutters, Solderers, and Brazers	163	\$12.88	\$26,790	\$22.30	\$46,384
51-4122	Welding, Soldering, and Brazing Machine Setters, Operators, and Tenders	15	\$11.15	\$23,192	\$15.46	\$32,157
Total		914				
Average			\$14.19	\$29,519.82	\$23.03	\$47,897.78
Weighted Average			\$14.96	\$31,043.35	\$24.34	\$50,550.68

Data provided by Jenni Abbott, Technical Assistant Provider, Center of Excellence Labor Market Research

Explanation of Employer Relationship

Employer data was created by the Center of Excellence for the CTE Enhancement Fund. Data used is for the Central Valley and Mother Lode Regions.

List of Members of Advisory Committee

K. Birdwell
 J. Silvera
 E. Pulido
 K. Vargas
 P. Smith
 R. Evans

Recommendation of Advisory Committee

Minutes

Date 8/11/15
Time 5:31 – 7:02
Location FB-03

Person	Present	
	Yes	No
Kerri Birdwell	x	
John Silvera	x	
Kurt Quade		x
Chris Chaney	x	
Eddie Pulido	x	
Katie Vargas	x	
Jamie Anthony		x
Phil Smith	x	
Richard Evans	x	
Clint Cowden	x	
Tim Ellsworth	x	

1.0 Call to order

- 1.1 Call to order
 - 1.1.1 K. Birdwell called the meeting to order at 5:31 pm on August 11, 2015
- 1.2 No Additions to the Agenda
 - 1.2.1 K. Vargas moved to accept the agenda with no additions
 - 1.2.2 P. Smith Seconded the motion
 - 1.2.3 Motion passed unanimously

2.0 Public Comments

- 2.1 No Public comments

3.0 Approval of Minutes

- 3.1 Previous minutes were tabled
 - 3.1.1 K. Birdwell moved to table previous minutes
 - 3.1.2 J. Silvera seconded the motion
 - 3.1.3 Motion passed unanimously

4.0 Administrative Report

- 4.1 State of the Farm – C. Cowden
 - 4.1.1 Preliminary garlic tonnage = 5 tons/acre, almond production appears to be lower than last year even with 4 acre-ft of leach water applied during water dormancy, pistachios appear to be similar to the rest of the region with a good amount of bunches but blanks appear to be an issue, 2016 cropping plan will include 22 acres of pistachios, 25 acres of almonds, 30 acres of fresh market garlic, 30 acres of processing tomatoes, 25 acres of student hay projects, 5 acre sugar beet trial

5.0 Old Business

5.1 Curriculum Process – Tim Ellsworth

5.1.1 Faculty communicate with advisory board regarding the future training needs for the Valley → Faculty gathers this information and compares to available C-ID courses if not available, use the DQP process to develop curriculum → this curriculum is brought to Ag area meeting to ensure it is supported by Labor Market data → curriculum, labor market data and C-ID is presented to the advisory committee for input and approval → this curriculum is submitted to the West Hills College Coalinga curriculum committee where content as well as rigor are assessed and approved → The curriculum is then forwarded to the Chief Instructional Officer to ensure it fits with the college mission and goals → Now curriculum is submitted to the West Hills College Board of Trustees for approval → Upon Board approval the curriculum is submitted to the Regional Vocational Curriculum Committee to ensure program does not negatively impact regional programs and to ensure it meets rigor → Upon approval the curriculum is submitted to the California Community College Chancellor's Office for approval

5.2.2 Because this process took over 1 year to be completed we are reviewing this curriculum packet

6.0 New Business

6.0 K. Vargas moved to treat 6.1 – 6.4 as one item

6.0.1 J. Silvera seconded the motion

6.0.2 Motion Passed unanimously

6.1 Irrigation Engineering Technology

6.2 Industrial Maintenance Technology

6.3 Integrated Pest Management

6.4 Welding Technology

6.1-4 Combined Curriculum

6.1-4.1 R. Evans moved to approve the curriculum as submitted

6.1-4.2 P. Smith seconded the motion

6.1-4.3 Motion passed unanimously

7.0 Standing Reports

7.1 **Precision Ag** – The industry is contracting due to the corn prices in the Midwest. There is an increasing need for entry-level technicians who understand more about electronics and hydraulics. There is a push for more precision ag in water and sensor based agriculture.

7.2 **PCA/CCA** – There is still a need for more PCAs and CCAs in the Valley and courses need to be taught so that working professionals can take them (i.e. weekends and evenings.) Continue to align curriculum so that it will allow students to path both the CCA and PCA credentialing.

7.3 **Irrigation** – As a group, the advisory committee doesn't agree with the content that is being covered in the Irrigation Association's Certified Agricultural Irrigation Specialist exam, but it is still the industry standard and therefore be used as the structure for the curriculum, but California requirements need to be expressed and taught such as scientific irrigation scheduling during off-peak energy cycles.

7.4 **Welding** – There have been a lot of layoffs in the oil fields over the past 6 months, but there is still a need for structural and manufacturing welding. Therefore additional welding opportunities, other than in the oil fields, need to be stressed to students.

7.5 Heavy Equipment – Employment is still slow but with high speed rail coming on we will need to have our program up and going to fill this need. We probably should look at contract training, especially with technology.

7.6 IMT – Agriculture products manufacturing is still king in our region which means seasonality. We try to offer the sequenced courses for skill upgrade of current workers such that graduation happens during hiring phases.

8.0 Announcements

8.1 No announcements

9.0 Adjournment

9.1 K. Birdwell adjourned the meeting at 7:02

Adequate Resources & Compliance

Library and Learning Resources Plan

The Learning Resources collection has been reviewed by the faculty originator and the librarian.

The following resources are currently available for course support:

Books

Reference Materials

Media

Electronic Resources

The following resources are recommended for purchase to further support the course:

Books

Reference Materials

Media

Electronic Resources

Additional Comments: A copy of the course texts for student use would be beneficial.

Facilities and Equipment Plan

Room Space Requirements:	Lecture classroom and welding laboratory
Staff Requirements:	One FTE faculty for certificate
Equipment Requirements:	Equipment for startup of proposed certificate - \$100,000

Financial Support Plan

One full-time faculty is paid through the general fund with additional courses taught by adjunct as grant funding allows.

Faculty Qualifications and Availability

Discipline: Welding or Agricultural Engineering

Faculty Qualifications: Any Bachelor's degree and two years of professional experience or any Associate's degree and six years professional experience.

Faculty Availability:

Full-Time Faculty: 1 FTE Faculty

Adjunct Faculty: 3, 0.5 FTE Faculty

Based on model curriculum (if applicable)

Curriculum content and hours based on NCCER (National Center for Construction Education and Research) Core Curriculum and Welding coursework Levels I through III.

Licensing or Accreditation Standards

Students can complete AWS (American Welding Society) welding certifications.

Student Selection and Fees

No limitation on enrollment and no materials fee.

PROGRAM PROPOSAL PACKET

FACULTY ORIGINATOR: C. Chaney

DATE: 4/13/2015

New Program Proposal

Program Revision Proposal

PROGRAM NAME: Welding Technology

TYPE OF DEGREE: AA or AS Degree

Certificate

AA-T or AS-T

CHECKLIST: (check all that apply)

AA-T or AS-T Addendum

CTE Addendum

1. Statement of Program Goals and Objectives

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2. Catalog Statement

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3. Program Course Requirements (as it is to appear in the College Catalog)

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WT 74	GMAW and FCAW: Plate	3
WT 75	SMAW Pipe Welding.....	2
WT 76	Welding Certification Preparation.....	0.5
	Total.....	18.5

4. Program Prerequisite, Corequisite, or Advisory Courses

5. Program Prerequisite Skills and/or Knowledge

6. Background and Rationale

Welding is a diverse industry with a tremendous variety of career opportunities. Students that successfully complete the Welding Technology program requirements and associated certifications will have the safety, cutting, and welding skills necessary to obtain entry level employment. With the increase in the amount of retirees, the demand for certified welders increases. Career opportunities exist in oil production and maintenance, agriculture, fabrication, manufacturing and construction.

PROGRAM PROPOSAL PACKET
Career Technical Education Addendum

FACULTY ORIGINATOR: C. Chaney

DATE: 4/13/2015

PROGRAM NAME: Welding Technology

TYPE OF DEGREE:

- Associate of Arts for Transfer
- Associate of Science for Transfer
- Associate of Arts
- Associate of Science
- Certificate

ATTACHMENTS REQUIRED

- Labor/Job Market Data
- Employer Survey
- Minutes of Key Meetings

1. Labor Market Information and Analysis (required for new programs)

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INSTRUCTIONAL AREA: CTE

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2. Employer Survey (required for new programs)

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3. Explanation of Employer Relationship (required for new programs)

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INSTRUCTIONAL AREA: CTE

4. List of Members of Advisory Committee (required for new and revised programs)

K. Birdwell
J. Silvera
E. Pulido
K. Vargas
P. Smith
R. Evans

5. Recommendations of Advisory Committee (required for new and revised programs)

Minutes

Date 8/11/15
 Time 5:31 – 7:02
 Location FB-03

Person	Present	
	Yes	No
Kerri Birdwell	x	
John Silvera	x	
Kurt Quade		x
Chris Chaney	x	
Eddie Pulido	x	
Katie Vargas	x	
Jamie Anthony		x
Phil Smith	x	
Richard Evans	x	
Clint Cowden	x	
Tim Ellsworth	x	

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2.0 Public Comments

- 2.1 No Public comments

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Now curriculum is submitted to the West Hills College Board of Trustees for approval → Upon Board approval the curriculum is submitted to the Regional Vocational Curriculum Committee to ensure program does not negatively impact regional programs and to ensure it meets rigor → Upon approval the curriculum is submitted to the California Community College Chancellor's Office for approval

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6.2 Industrial Maintenance Technology

6.3 Integrated Pest Management

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8.0 Announcements

8.1 No announcements

9.0 Adjournment

9.1 K. Birdwell adjourned the meeting at 7:02