

# West Hills College Coalinga CTE Program Endorsement Industrial Maintenance Technology

## Appropriateness to Mission

### Statement of Program Goals and Objectives

The Industrial Maintenance Technology program prepares students for entry-level employment in careers of industrial maintenance, industrial machine operation, industrial electrician, corrections facilities maintenance, agricultural maintenance, and food service machine technicians. Students completing this certificate will acquire employment skills in electrical circuits, motor controls and programmable motor drives, programmable logic controllers, hydraulics/pneumatics, industrial mechanics, machining, refrigeration and boilers, and welding. Upon successful completion of this certificate, students will be prepared for employment in the following fields: industrial maintenance technician; industrial engineering technician; production, planning and expediting clerk; electrical and electronic repair technician; commercial and industrial equipment repair technician; industrial machinery mechanic; assemblers and fabricators; industrial machine operator; industrial electrician; corrections facilities maintenance; agricultural maintenance; and food service machine technician.

Upon completion of the Industrial Maintenance Technology certificate the student will be able to meet the following objectives:

- a. demonstrate the use and care of appropriate personal protective equipment;
- b. identify and safely use basic hand and power tools;
- c. identify, interpret and use basic construction drawing terms, components, symbols and dimensions;
- d. setup, light, use, safely operate, shutdown and disassemble oxyfuel cutting equipment;
- e. explain how to read and convert from one scale to another using tachometers, pyrometers, multimeters, automated diagnostic tools, voltage testers and stroboscopes;
- f. identify the various techniques used in hanging and supporting copper and plastic piping;
- g. properly measure, cut, and join copper and plastic piping;
- h. cut, ream, and thread ferrous metal pipe;
- i. align couplings using feeler gauge, straight-edge and dial indicator methods;
- j. identify and install belt drives and chain drives;
- k. identify, remove and install mechanical seals.

### Catalog Description

The Industrial Maintenance Technology program prepares students for careers for entry-level employment in the fields of industrial maintenance, industrial machine operation, industrial electrician, corrections facilities maintenance, agricultural maintenance, and food service machine technicians. Students completing this certificate will acquire employment skills in the area of electricity, motor controls and programmable motor drives, programmable logic controllers, hydraulics/pneumatics, industrial mechanics, machining, refrigeration and boilers, and welding. Upon successful completion of this certificate, students will be prepared for employment in the following fields: industrial maintenance technician; industrial engineering technician; production, planning and expediting clerk; electrical and electronic repair technician; commercial and industrial equipment repair technician; industrial

machinery mechanic; assemblers and fabricators; industrial machine operator; industrial electrician; corrections facilities maintenance; agricultural maintenance; and food service machine technician.

Program student learning outcomes:

- Students will demonstrate the use of appropriate personal protective equipment for specialized working conditions.
- Students will determine which tools are appropriate for a given working condition and demonstrate the proper and safe use of those tools.
- Given a blueprint, students will properly read and describe what the symbols and drawings represent on the jobsite.
- Students will demonstrate the proper diagnosis and troubleshooting of a power transmission device.

### Program Requirements

<b>Course #</b>	<b>Title</b>	<b>Units</b>
IMT 60 .....	Industrial Core.....	3
IMT 61 .....	Industrial Maintenance Mechanic Level I.....	3
IMT 62 .....	Industrial Maintenance Mechanic Level II.....	4
IMT 70 .....	Industrial Maintenance Mechanic Level III.....	4
<b>Total.....</b>		<b>14</b>

In addition to the core courses the student must take at least four units from the following courses:

<b>Course #</b>	<b>Title</b>	<b>Units</b>
AG 14.....	Tractors.....	3
AG 15X.....	Occupational Work Experience .....	1-4
AGBUS 15 .....	Computer Application to Agriculture .....	3
AET 10 .....	Surveying .....	3
AET 11 .....	Advanced Surveying with GIS Applications .....	2
AET 15 .....	CAD for Agriculture .....	2
IS 1.....	College Success.....	3
IS 2.....	Career Planning .....	1
WT 70 .....	Introduction to Certified Welding .....	2.5
WT 71 .....	Beginning SMAW .....	3
<b>Total .....</b>		<b>4</b>

**Total Units Required for Certificate ..... 18**

### Background and Rationale

Industrial maintenance mechanics are needed in every industry that uses machinery, from assembly plants to power manufacturers. Not only do mechanics repair and maintain equipment, they also install and dismantle it. Every time a new appliance leaves a factory or a new car rolls off the line, a skilled mechanic played a role in producing it. Wherever there are machines, there will be a need for maintenance craftworkers. NCCER's three-level curriculum covers topics such as Oxyfuel Cutting, Introduction to Piping Components, and Laser Alignment.

## **Curriculum Standards**

### Display of Proposed Sequence

Fall Semester

IMT 60

IMT 61

IMT 62

Spring Semester

IMT 70

Elective 1

Elective 2

### Transfer Applicability (if applicable)

Not Applicable

## **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 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: Industrial Engineering Technicians (17-3026); Production, Planning, and Expediting Clerks (43-5061); Electrical and Electronics Repairers, Commercial and Industrial Equipment (49-2094); Control and Valve Installers and Repairers, Except Mechanical Door (49-9012); Industrial Machinery Mechanics (49-9041); Assemblers and Fabricators, All Other (51-2099); Production Workers, All Other (51-9199).

SOC	Description	2013 Jobs	2016 Jobs	Change	% Change	Replacements	Openings	Annual Openings
17-3026	Industrial Engineering Technicians	194	205	11	6%	13	24	8
43-5061	Production, Planning, and Expediting Clerks	2,454	2,572	118	5%	192	310	103
49-2094	Electrical and Electronics Repairers, Commercial and Industrial Equipment	512	531	19	4%	33	52	17
49-9012	Control and Valve Installers and Repairers, Except Mechanical Door	462	493	31	7%	52	83	28
49-9041	Industrial Machinery Mechanics	4,566	4,919	353	8%	430	783	261
51-2099	Assemblers and Fabricators, All Other	1,311	1,525	214	16%	80	294	98
51-9199	Production Workers, All Other	2,332	2,550	218	9%	208	426	142
Total								657

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
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49-9012	Control and Valve Installers and Repairers, Except Mechanical Door	28	\$15.06	\$31,325	\$29.69	\$61,755
49-9041	Industrial Machinery Mechanics	261	\$14.10	\$29,328	\$24.28	\$50,502
51-2099	Assemblers and Fabricators, All Other	98	\$10.01	\$20,821	\$12.66	\$26,333
51-9199	Production Workers, All Other	142	\$8.99	\$18,699	\$13.90	\$28,912
Total		657				
Average			\$12.45	\$25,889.13	\$20.12	\$41,845.55
Weighted Average			\$13.73	\$28,551.47	\$21.64	\$45,014.67

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 mechanics 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: Industrial Maintenance

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 Industrial Maintenance Mechanic coursework Levels I through III.

Licensing or Accreditation Standards

N/A

Student Selection and Fees

No limitation on enrollment and no materials fee.

PROGRAM PROPOSAL PACKET

FACULTY ORIGINATOR: T. Ellsworth

DATE: 7/10/2015

New Program Proposal

Program Revision Proposal

PROGRAM NAME: Industrial Maintenance 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

**The stated goals of the program must include (but are not limited to) the preparation of students for one or more baccalaureate majors. Often the stated goals are the Program Student Learning Outcomes. If the degree is AA-T or AS-T the statement must also include language referencing the intent of the degree which is to provide students with a seamless transfer to the CSU.**

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- h. cut, ream, and thread ferrous metal pipe;
- i. align couplings using feeler gauge, straight-edge and dial indicator methods;
- j. identify and install belt drives and chain drives;
- k. identify, remove and install mechanical seals.

2. Catalog Statement

**INSTRUCTIONAL AREA: CTE**

**This must be written exactly as it will appear in the college catalog. The statement must include the program’s goals and objectives. The AA-T and AS-T degrees require specific language per Education Code 66746. CTE proposals must state employment options that will be available for the student upon degree completion.**

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- Given a blueprint, students will properly read and describe what the symbols and drawings represent on the jobsite.
- Students will demonstrate the proper diagnosis and troubleshooting of a power transmission device.

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

<b>Course #</b>	<b>Title</b>	<b>Units</b>
IMT 60 .....	Industrial Core.....	3
IMT 61 .....	Industrial Maintenance Mechanic Level I .....	3
IMT 62 .....	Industrial Maintenance Mechanic Level II .....	4
IMT 70 .....	Industrial Maintenance Mechanic Level III .....	4
	<b>Total.....</b>	<b>14</b>

In addition to the core courses the student must take at least four units from the following courses:

<b>Course #</b>	<b>Title</b>	<b>Units</b>
AG 14 .....	Tractors.....	3
AG 15X.....	Occupational Work Experience .....	1-4
AGBUS 15 .....	Computer Application to Agriculture .....	3
AET 10.....	Surveying .....	3
AET 11.....	Advanced Surveying with GIS Applications .....	2
AET 15.....	CAD for Agriculture.....	2
IS 1 .....	College Success.....	3
IS 2 .....	Career Planning .....	1
WT 70 .....	Introduction to Certified Welding .....	2.5
WT 71 .....	Beginning SMAW .....	3
	<b>Total .....</b>	<b>4</b>

**Total Units Required for Certificate .....18**

**INSTRUCTIONAL AREA: CTE**

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4. Program Prerequisite, Corequisite, or Advisory Courses

5. Program Prerequisite Skills and/or Knowledge

6. Background and Rationale

Industrial maintenance mechanics are needed in every industry that uses machinery, from assembly plants to power manufacturers. Not only do mechanics repair and maintain equipment, they also install and dismantle it. Every time a new appliance leaves a factory or a new car rolls off the line, a skilled mechanic played a role in producing it. Wherever there are machines, there will be a need for maintenance craftworkers. NCCER's three-level curriculum covers topics such as Oxyfuel Cutting, Introduction to Piping Components, and Laser Alignment.

**PROGRAM PROPOSAL PACKET**  
**Career Technical Education Addendum**

FACULTY ORIGINATOR: T. Ellsworth

DATE: 4/6/2015

PROGRAM NAME: Industrial Maintenance 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)

The following SOC codes were used for employment: Industrial Engineering Technicians (17-3026); Production, Planning, and Expediting Clerks (43-5061); Electrical and Electronics Repairers, Commercial and Industrial Equipment (49-2094); Control and Valve Installers and Repairers, Except Mechanical Door (49-9012); Industrial Machinery Mechanics (49-9041); Assemblers and Fabricators, All Other (51-2099); Production Workers, All Other (51-9199).

**INSTRUCTIONAL AREA: CTE**

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<b>Total</b>								<b>657</b>

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2. Employer Survey (required for new programs)

**INSTRUCTIONAL AREA: CTE**

SOC	Description	Annual Openings	Pct 10 Hourly Earnings	10th Percentile Annual	Median Hourly Earnings	Median Annual Wages
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Weighted Average			\$13.73	\$28,551.47	\$21.64	\$45,014.67

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

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.

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	

### 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