

## Program Creation Process Sign-Off

**Program Title:** Associate in Science in Ventilation, Air Conditioning, and Refrigeration

**Program Units:** 90 Units

**Division:** Apprenticeship

**Proposing Faculty name(s):** Robbie Kunkel

**Type of Program:** \_\_\_\_\_ Transfer      or       Workforce

**Type of Award:**

Non-transcribable certificate

Certificate of Achievement

AA/AS Degree

### Documentation checklists:

#### Transfer documentation

Catalog Description

List of Courses

Articulation & transfer data

Identification of existing program(s) at  
CSU/UCs

Completer Projections

Identification of any additional  
resources needed to establish program  
(i.e. faculty, equipment, etc.)

#### Workforce documentation

Catalog Description

List of Courses

Completer Projections

Labor Market information

Identification of any similar program(s)  
in the area (NONE)

Identification of any additional  
resources needed to establish program  
(i.e. faculty, equipment, etc. (NONE))

**Transfer/Workforce Work Group:**

Recommended

Not Recommended

**Comments:**

Work Group Signature: 

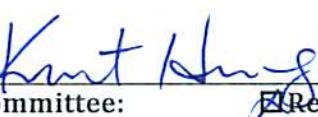
Date: 4-20-16

Supervising Vice President:

Recommended

Not Recommended

**Comments:**

Vice President Signature: 

Date: 4/29/16

Planning & Resource Committee:

Recommended

Not Recommended

**Comments:**

PaRC Signature:

Date:

Division Curriculum Committee:

Recommended

Not Recommended

**Comments:**

Division CC Signature:

Date:

Following the review by the listed committees, this form should be forwarded to the Office of Instruction.

10/22/14

**FOOTHILL COLLEGE**  
**Credit Program Narrative**  
**Associate in Science Degree in Ventilation, Air Conditioning, and Refrigeration**

**Item 1. Program Goals and Objectives**

The goals and objectives of the Associate in Science degree in Ventilation, Air Conditioning, and Refrigeration align with the primary mission of California community colleges, as established in Ed. Code § 66010.4, which mandate that community colleges provide vocational instruction to students and advance California's economic growth and global competitiveness through education and training that contribute to workforce development. The Associate in Science degree in Ventilation, Air Conditioning, and Refrigeration aligns with Foothill College's Institutional Outcomes and directly supports the Computation and the Creative, Critical, and Analytical Thinking rubrics.

The Associate in Science degree in Ventilation, Air Conditioning, and Refrigeration at Foothill College serves to align apprenticeship programs with college and university academic tracks as directed by the federal and state government. Foothill College, functioning as the Local Education Agency for the Division of Apprenticeship Standards for the state of California, is collaborating with the Joint Apprenticeship Training Center of San Mateo County, UA Local #467, to offer this degree.

Foothill College is responding to local demand for Pipe Trades workers in Refrigeration, Ventilation, Heating, and Air Conditioning (HVAC) by establishing an Associate in Science degree in Ventilation, Air Conditioning, and Refrigeration in partnership with the Joint Apprenticeship Training Center (JATC) of the Plumbers and Steamfitters UA Local #467, located in Burlingame, California. Graduates are recognized as journeypersons within the Pipe Trades industry and will increase their marketability and employment opportunities. Graduates will be employable as: Service Manager, Facilities Manager, Project Manager, Estimator, HVACR Instructor, HVACR Sustainable Technologies Technician, and Union Business Agent/ Business Manager.

The program learning outcomes for the Associate in Science degree in Ventilation, Air Conditioning, and Refrigeration are:

- In compliance with applicable standards and codes, students will demonstrate ability to install and remove piping and equipment for sophisticated heating and air conditioning applications and special industrial piping systems, such as those used in research and development and production in the semiconductor, biotechnology, and power generation industries.
- In compliance with applicable standards and codes, students will demonstrate ability to assess, maintain, extend, and/or alter piping and equipment for heating and air conditioning, and for special industrial piping systems.

Students complete the associate degree through enrollment in the Ventilation, Air Conditioning, and Refrigeration apprenticeship program at the JATC of San Mateo County and through enrollment in the General Education requirements at Foothill College. To apply to the JATC apprenticeship program, potential students must be at least 18 years of age, be able to perform the work of the trade, present verification of high school completion, either through a high school diploma or GED or High School Proficiency certificate, demonstrate the ability to read, write, and speak English, and establish passing grades, at a C or better, in two high-school-level mathematics courses by presenting a high school or college transcript. The selection, employment, and training of apprentices by the JATC of San Mateo County is without discrimination according to race, color, national or ethnic origin, age, gender, religion, sexual orientation or marital status. Students are admitted into the apprenticeship program based on obtaining a passing (70%) score on a mathematics entrance exam, which measures the student's ability in math and mechanical reasoning. Students who pass the mathematics entrance exam will be given an oral interview. Students that progress past the interview will be given a list of signatory contractors they may contact for sponsorship into the apprenticeship program. Students will be ranked on a waiting list according to written test and interview scores. Admission to apprenticeship classes is limited to apprentices registered with the California Division of Apprenticeships Standards. This limitation is authorized by the California Labor Code, Section § 3074.3.

Aside from Foothill College's ordinary enrollment fees, there are no additional costs to the student to complete the Associate in Science degree in Ventilation, Air Conditioning, and Refrigeration.

### **Item 2. Catalog Description**

The Associate in Science degree in Ventilation, Air Conditioning, and Refrigeration program is conducted in partnership with the Joint Apprenticeship Training Center of the UA Local #467 apprenticeship program of San Mateo County. The apprenticeship program is five years in duration, requiring a minimum of 10,000 hours of on-the-job training and 1,340 hours of classroom instruction. After 5 years of classroom and paid work experience, students are recognized as journeypersons within the Pipe Trades industry and work to ensure indoor air quality by servicing and repairing all types of refrigeration and ventilation equipment in all sizes and types of buildings, and complex air conditioning, heating, and refrigeration units used in hospitals, office and educational buildings, manufacturing facilities, and research development laboratories. Graduates of the Associate in Science degree in Ventilation, Air Conditioning, and Refrigeration program will be employable as: Service Manager, Facilities Manager, Project Manager, Estimator, HVACR Instructor, HVACR Sustainable Technologies Technician, and/or a Union Business Agent/ Business Manager in almost any industry including biotech, research, and manufacturing, the construction and renovation of airports and office buildings, educational institutions, hotels and resort destinations, shopping centers and malls, residential homes and developments, and water and waste treatment facilities. Labor Market Analysis indicates increased employment opportunities in the Pipe Trades through 2020. Students earning an associate's degree will increase their marketability and employment opportunities. Admission to apprenticeship classes is limited to apprentices registered with the California Division of Apprenticeships Standards, according to the California Labor Code, Section § 3074.3.

The apprenticeship program, which includes coursework, lab work and on-the-job training, involves learning about the assessment, installation, maintenance, and repair of different types of pipe systems, electronic control systems, refrigeration and air conditioning systems and systems involving steam, sprinkling, lubrication, and other industrial processing systems. The courses required for the Associate in Science degree in Ventilation, Air Conditioning, and Refrigeration also meet the requirements for the Certificate of Achievement in Ventilation, Air Conditioning, and Refrigeration. The General Education option at Foothill College includes courses to establish proficiency in English and Math and to survey other academic areas such as history and humanities. The Associate in Science degree in Ventilation, Air Conditioning, and Refrigeration is not a transfer program. Foothill College apprenticeship students who intend to transfer must consult with a program advisor or counselor to ensure that the requirements for transfer to the baccalaureate institutions of their choice are met.

Students are admitted into the apprenticeship program based on obtaining a passing (70%) score on a mathematics entrance exam, which measures the student's ability in math and mechanical reasoning. Students who pass the mathematics entrance exam will be given an interview, and those students progressing past the interview will be given a list of signatory contractors they may contact for sponsorship into the apprenticeship program. Students will be ranked on a waiting list according to written test and interview scores.

### **Item 3. Program Requirements**

Requirements	Course #	Name	Units	CSU-GE	IGETC	Sequence
Core Courses (42.5 Quarter Units)	APPT 171	Basic Refrigeration, Heritage, Customer Service	4.0			Yr 1, Fall
	APPT 172	Refrigeration Science, Customer Service II	4.5			Yr 1, Winter
	APPT 173	Basic Electricity for the HVAC Service Trade	4.0			Yr 2, Fall
	APPT 174	Advance Electricity & Pneumatic DDC Introduction	4.5			Yr 2, Winter
	APPT 175	Control I: Electro Pneumatics	4.0			Yr 3, Fall

	APPT 176	Controls II: Advanced Pneumatics, Calibration, & Hydronics	4.5			Yr 3, Winter
	APPT 177	Start, Test, and Balance I	4.0			Yr 4, Fall
	APPT 178	Start, Test, and Balance II	4.5			Yr 4, Winter
	APPT 179	Chillers, VFD's, Special Equipment & Systems	4.0			Yr 5, Fall
	APPT 180	HVACR Star Review and Exit Exam	4.5			Yr 5, Winter

<b>Required Major Total</b>	<b>42.5 units</b>
Completion of Foothill GE pattern	35 units
Transferable electives (as needed to reach 60 units)	12.5 units
<b>TOTAL UNITS</b>	<b>90 units</b>

**Proposed Sequence: (to include general education courses)**

Year 1, Fall = 10 units

Year 1, Winter = 10 units

Year 2, Fall = 10 units

Year 2, Winter = 10 units

Year 3, Fall = 10 units

Year 3, Winter = 10 units

Year 4, Fall = 10 units

Year 4, Winter = 10 units

Year 5, Fall = 5.0 units

Year 5, Winter = 5.0 units

**TOTAL UNITS: 90 units**

**Item 4. Master Planning**

The Associate in Science degree in Ventilation, Air Conditioning, and Refrigeration aligns with the planned goals of the College and the District because the program serves the regional area in support of workforce development and economic growth. The Associate in Science degree in Ventilation, Air Conditioning, and Refrigeration is a new degree, specifically offered in partnership between Foothill College, as Local Education Agency, and the UA Local #467, and monitored by the Division of Apprenticeship Standards. This degree does not duplicate an already-existing program within the Foothill-De Anza district or the surrounding colleges. The courses and programs offered by the Joint Apprenticeship Training Center of the Plumbers and Steamfitters UA Local #467 are unique in scope and differ substantially from other Joint Apprenticeship Training Centers serviced by Foothill College in its role as Local Education Agency for the Division of Apprenticeship Standards.

Competition to the Associate in Science degree in Ventilation, Air Conditioning, and Refrigeration program at Foothill College primarily occurs from an out-of-state college that offers on-line degrees. Apprentices and recently-graduated journeymen of the UA Local #467 are taking on-line courses at Washtenaw Community College at considerably higher tuition, \$202/credit hour, and incurring other expenses in order to earn an Associate in Applied Science degree in HVACR Sustainable Technologies or Industrial Journeyman. Offering an Associate in Science degree in Ventilation, Air Conditioning, and Refrigeration at Foothill College would well serve the college's primary stakeholders: the students, community partners, and the community at-large.

Local references in support of the Associate in Science degree in Ventilation, Air Conditioning, and Refrigeration include all Advisory Committee representatives from the UA Local #467 Joint Apprenticeship Training Center of San Mateo County, who strongly support the partnership between the training center and Foothill College due to their understanding of local economic workforce needs and their ongoing contact with apprenticeship students, which provides grounded understanding of their students' short-term and long-term educational goals.

**Item 5. Enrollment and Completer Projections**

Course #	Course Title	Year 1		Year 2	
		Annual Sections	Annual Enrollment	Annual Sections	Annual Enrollment
APPT 171	Basic Refrigeration, Heritage, Customer Service	1	13	1	14
APPT 172	Refrigeration Science, Customer Service II	1	12	1	15
APPT 173	Basic Electricity for the HVAC Service Trade	1	18	1	12
APPT 174	Advance Electricity & Pneumatic DDC Introduction	1	18	1	12
APPT 175	Control I: Electro Pneumatics	1	16	1	17
APPT 176	Controls II: Advanced Pneumatics, Calibration, & Hydronics	1	16	1	16
APPT 177	Start, Test, and Balance I	1	11	1	17
APPT 178	Start, Test, and Balance II	1	11	1	18
APPT 179	Chillers, VFD's, Special Equipment & Systems	1	14	1	11
APPT 180	HVACR Star Review and Exit Exam	1	14	1	11

**Item 6. Place of Program in Curriculum/Similar Programs**

The Associate in Science degree in Ventilation, Air Conditioning, and Refrigeration does not adversely affect existing programs at Foothill College in terms of competition for students or courses, nor does it take material resources away from other existing programs at the College. The Associate in Science degree in Ventilation, Air Conditioning, and Refrigeration is designed to create pathways for students from Pre-Apprenticeship and Apprenticeship through an associate's degree and potential transfer to a four-year institution. Thus, the students can easily move from the Certificate of Achievement in Ventilation, Air Conditioning, and Refrigeration to the Associate in Science degree in Ventilation, Air Conditioning, and Refrigeration. This streamlined approach facilitates the students' ability to readily complete their educational goals and to earn family-supporting wages.

**Item 7. Similar Programs at Other Colleges in Service Area**

There are no similar college programs in existence in the college service area of Foothill College that serve the specific needs of the technology industry; the partnership with the UA Local #467 Joint Apprenticeship Training Center of San Mateo County is unique in the college service area.

**Appendix A:**

**Labor Market Analysis**

**for Ventilation, Air Conditioning, and Refrigeration Employment**

**for San Mateo, San Francisco, and Marin Counties**

**from 2012 – 2022**

Employment Development Department		2012-2022 Occupational Employment Projections												
Labor Market Information Division		San Francisco-San Mateo-Redwood City Metropolitan Division												
Published: December 2014		(Marin, San Francisco, and San Mateo Counties)												
SOC Code*	Occupational Title	Estimated Employment 2012**	Projected Employment 2022	Numeric Change 2012-2022 [1]	Percent Change 2012-2022	Annual Average Percent Change	Average Annual Job Openings		2014 First Quarter Wages [5]		Education and Training Levels [7]			
							New Jobs [2]	Replace-ment Needs [3]	Total Jobs [4]	Median Hourly	Median Annual	Entry Level Education	Work Experience	On-the-Job Training
49-3093	Tire Repairers and Changers	530	490	-40	-7.5%	-0.8%	0	19	19	\$14.63	\$30,412	7	None	ST OJT
49-9000	Other Installation, Maintenance, and Repair Occupations	11,810	12,800	990	8.4%	0.8%	109	252	361	N/A	N/A			
49-9012	Control and Valve Installers and Repairers, Except Mechanical Door	320	330	10	3.1%	0.3%	0	11	11	\$37.05	\$77,057	7	None	MT OJT
49-9021	Heating, Air Conditioning, and Refrigeration Mechanics and Installers	690	750	60	8.7%	0.9%	6	18	24	\$28.91	\$60,131	5	None	LT OJT
49-9041	Industrial Machinery Mechanics	490	440	-50	-10.2%	-1.0%	0	14	14	\$34.18	\$71,083	7	None	LT OJT
49-9043	Maintenance Workers, Machinery	130	130	0	0.0%	0.0%	0	2	2	\$20.43	\$42,483	7	None	MT OJT
49-9052	Telecommunications Line Installers and Repairers	540	630	90	16.7%	1.7%	9	13	22	\$33.71	\$70,126	7	None	LT OJT
49-9071	Maintenance and Repair Workers, General	6,800	7,540	740	10.9%	1.1%	74	131	205	\$22.79	\$47,399	7	None	LT OJT
49-9098	Helpers—Installation, Maintenance, and Repair Workers	430	450	20	4.7%	0.5%	2	13	15	\$21.87	\$45,496	7	None	MT OJT
49-9099	Installation, Maintenance, and Repair Workers, All Other	1,500	1,610	110	7.3%	0.7%	10	25	35	\$23.01	\$47,867	7	None	MT OJT

**Appendix B:**  
**Minutes of Advisory Committee Meeting**  
**Conferring Approval for Certificate and Degree Program**  
**Partnership with Foothill College**

## JOINT APPRENTICESHIP & TRAINING COMMITTEE MINUTES

October 23, 2015

The Joint Apprenticeship and Training Committee of the Plumbing, Pipe Fitting and Refrigeration Air Conditioning Industry of San Mateo County met at the Training Center, 1519 Rollins Road, Burlingame.

### **ROLL CALL:**

The meeting was called to order at 5:00 p.m. by **Chairman Mike Dougherty** with the following Trustees and Advisors in attendance:

<u><b>Labor:</b></u>	<u><b>Management:</b></u>	<u><b>Advisors:</b></u>
M. Swanson	D. Taylor	B. Kay – D.O.T.
C. Collins	P. Carlevaris	G. Knight - DAS
M. Burri	B. Whitney	
M. Dougherty	R. Monaghan	
D. Black	R. Bellanti	
M. Nelson		

### **MINUTES OF THE PREVIOUS MEETING:**

It was M/S/P to approve the minutes of the regular monthly JATC meeting of **September 25, 2015**, as presented.

### **FINANCIAL REPORT:**

Treasurer **Mark Burri** presented the financial report for **August 2015** and upon review, it was M/S/P to accept the financial reports for **September 2015**.

### **APPRENTICES CITED BEFORE J.A.T.C.**

- A. **Marino Sandoval** – Apprenticeship agreement cancelled for failure to comply with the rules and regulations of the JATC.

### **COMMUNICATIONS:**

**Bob Kay** reported on the following:

- A. Foothill College Financial Summary – July and August 2015
- B. Thank you letter from Peninsula High School for participating in their Career Day.

### **REPORT OF LOCAL UNION 467:**

**Mark Burri** reported there is 8% unemployment for Local 467 with very few apprentices out of work. There is continued improvement in employment opportunities.

### **REPORT OF DIVISION OF APPRENTICESHIP STANDARDS:**

**Gary Knight** reported that there are 109 active apprentices currently in Local 467. The DAS is continually participating in outreach, job fairs, and doing local high school presentations with an added message of the value of Apprenticeships! Also, a reminder of the 28<sup>th</sup> Biennial California Conference on Apprenticeship, July 30 – August 4, 2015.

### **REPORT OF SUPERVISOR OF INSTRUCTION:**

**Don Black** reported the Spring Semester has really been quick. The last day of classes is June 30, 2015.

**REPORT OF DIRECTOR OF TRAINING:**

Director of Training **Bob Kay** reported on the following:

- A. Bob let the committee know of the work being done with Foothill College to get State approved Certificates of Achievements and A/S Degrees for Our Plumbing/Pipe-Fitting and HVAC Apprenticeship Programs. A motion to approve an agreement with Foothill College was made. It was M/S/P to approve the agreement with Foothill College.
- B. Bob also presented a letter for the committee's review that will be sent to the State Chancellor's Office.
- C. A proposal to purchase new Window's 7 computers for Bob and Marie was reviewed. It was M/S/P to purchase the new computers.
- D. Reminder of the CAC meetings in San Diego next week.
- E. Bob reported that the entrance exam is complete and went very well. 73 passed and 65 Failed. Interviews will be held August 17<sup>th</sup>.

**OLD BUSINESS:**

None

**NEW BUSINESS:**

- A. Next JATC Meeting will be held November 19, 2015 at 5:00pm

**ACTION ITEMS:**

None

**ADJOURNMENT:**

With no further business, it was M/S/P to adjourn.

Respectfully submitted,

*Robert G. Kay*

Bob Kay

Director of Training

**Labor**

Mike Swanson (secretary)  
Business Manager  
Plumbers, Steamfitters,  
Refrigeration Fitters Local No. 467

Mark Burri (treasurer)  
Business Agent  
Plumbers, Steamfitters,  
Refrigeration Fitters Local No. 467

Christopher Collins  
Business Agent  
Plumbers, Steamfitters,  
Refrigeration Fitters Local No. 467

Michael Dougherty (chairman)  
Supervisor  
ACCO

Mark Nelson  
Supervisor  
Western Allied Mechanical

**Supervisor of Instruction**

Donald Black  
Instructor  
Plumbers, Steamfitters,  
Refrigeration Fitters Local No. 467

**Management**

Ron Bellanti  
Owner  
Bellanti Plumbing, Inc.

Rob Monaghan  
Owner  
Western Allied Mechanical

Scott Strawbridge  
Executive Director  
Northern Cal Mechanical Contractors

Phil Carlevaris  
Supervisor  
DPW, Inc.

Roger Klingen  
President  
Greater Bay Area of Mechanical Contractors

Don Taylor (co-chairman)  
Owner  
Dittmann Plumbing Inc.

**Advisor**

Robert Kay  
Director of Training  
Plumbers, Steamfitters,  
Refrigeration Fitters Local No. 467

**Appendix C:**  
**Declaration of Student Interest**  
**by UA Local #467 Joint Apprenticeship**  
**Training Center Board of Directors**

Local Union 467  
S. I. S.  
Refrigeration Filters

## JOINT APPRENTICESHIP & TRAINING COMMITTEE PLUMBING, PIPE FITTING & REFRIGERATION INDUSTRY OF SAN MATEO COUNTY

1519 ROLLINS ROAD • BURLINGAME, CA 94010-2305

(650) 692-0442 • FAX: (650) 692-7620 • [www.usalocal467.org](http://www.usalocal467.org)

ROBERT KAY  
DIRECTOR OF TRAINING

August 11, 2015

Chancellor's Office  
California Community College  
1102 Q Street  
Sacramento, CA 95811-6539

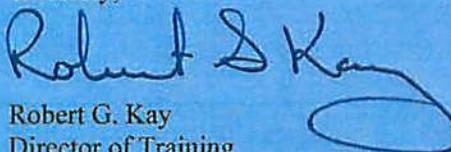
Dear Chancellor's Office:

Please be advised that an apprentice that earns an Associate of Science degree in the Pipe Trades industry and can perform at a journey person level and achieves a high standing within Local 467, will have a greater opportunity to stay with his/her current employer and will be in demand to work for any of the over two hundred and fifty employers signatory to UA Local 467. Thus a survey is not necessary.

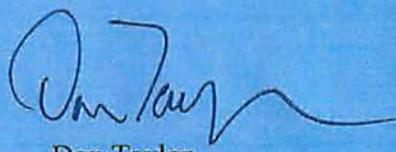
When the apprenticeship students can earn a certificate and degree at Foothill College, we believe the response will be very high and that all students will pursue the Certificate of Achievement and many others will pursue the Associate's degree in their area of expertise. Earning a Certificate of Achievement and an Associate's degree is highly regarded in the Plumbing, Pipe Fitting & Refrigeration Industry of San Mateo County as well as UA Local 467 and leads to increased earnings and career advancement for journeymen.

Based on the long-standing interest of the journeymen students to pursue earning college certificates and degrees, our Joint Apprenticeship Training Committee {i.e. Board of Directors} unanimously voted to recommend/endorse Foothill College's offering these certificates and degrees.

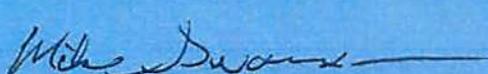
Sincerely,

  
Robert G. Kay

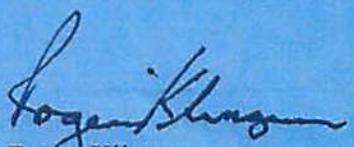
Director of Training  
UA Local 467 JATC  
Plumbing, Pipe Fitting, & Refrigeration Ind.  
San Mateo County

  
Don Taylor

Owner Dittmann Plumbing Inc.  
JATC Board Member



Mike Swanson  
Business Manager  
UA Local 467  
JATC Board Member

  
Roger Klingen

President  
Greater Bay Area Association of  
Plumbing, Heating, Cooling and Mechanical  
Contractors