IMPERIAL VALLEY COLLEGE
PROGRAM REVIEW COMPLIANCE FORM AND REQUEST FOR RESOURCES

PROGRAM/DEPARTMENT Industrial Technology Department- Air Conditioning ACADEMIC YR. 2013

X Comprehensive Program Review Annual Assessment Request for Resources (check all that apply)

Please analyze your Program Review data as well as your SLO/SAO assessment findings in order to update to your Comprehensive Program Review report as needed. All changes to area needs and subsequent requests for additional resources must be reported at this time.

If your program is scheduled for a Comprehensive Program Review all forms are to be completed and submitted to the appropriate Dean/VP. If you are completing the annual Program Review Assessment only and have no changes to area needs, sign below and submit this form to appropriate Dean/VP. If your needs have changed as a result of your annual assessment of program review data, please complete the appropriate Request for Resources form(s) and submit to appropriate Dean/VP.

Signature of Program Chair/Director — Date: 2/19/2013

Signature of Area Dean — Date: 2/20/13

Signature of Area Vice President — Date: 2/22/13

Please attach the following documents to this Program Review Compliance form if you are requesting additional resources:

- ✓ Comprehensive Program Review
- ✓ Data Analysis Form
- ✓ SLO/SAO Assessments
- ✓ Request for Resources Forms

Academic Program Evaluation – AIR CONDITIONING & REFRIGERATION

Division – EWD

Department - ITEC

ACR COURSES

TERM	Enrollment	Fill Rate	# of Sections	Mass Cap	Avg. Class Cap	Avg. Class Size	FTES	FTEF	PRODUCTIVITY	Completion Rate	Success Rate
Fall 2009	125	125%	5	100	20	25	18.75	1.45	12.93	94%	79%
Spring 2010	95	95%	5	100	20	19	14.43	1.45	9.95	93%	79%
Fall 2010	124	105.08%	6	118	19.67	20.67	19.81	1.78	11.13	96%	88%
Spring 2011	86	86%	5	100	20	17.2	13.2	1.45	9.1	95%	77%
Fall 2011	97	97%	5	100	20	19.4	15.3	1.45	10.55	74%	61%
Spring 2012	87	87%	5	100	20	17.4	14.92	1.65	9.04	98%	80%
% Change Fall Semesters 09 - 11	-22.40%	-22.40%	0.00%	0.00%	0.00%	-22.40%	-18.40%	0.00%	-18.41%	-21.28%	-22.78%
% Change Spring Semesters 10 - 12	-8.42%	-8.42%	0.00%	0.00%	0.00%	-8.42%	3.40%	13.79%	-9.15%	5.38%	1.27%

PROGRAM COMPLETION

Number of certificates completed Between Fall 2009 and Spring 2012	Number of Associate Degrees Completed Between Fall 2009 and Spring 2012
33	0

ACR COURSES - A.S AND CERTIFICATE

A.S. DEGREE: AIR CONDITIONING AND REFRIGERATION TECHNOLOGY:

ACR 101, 102, 103, 104, 105, 106, BLDC 130, EWIR 110, WELD 100

CERTIFICATE: AIR CONDITIONING AND REFRIGERATION TECHNOLOGY:

ACR 101, 102, 103, 104, 105, 106

ACR COURSES - ENROLLMENT, FILL RATE & WAIT LISTS

COURSES	Course Cap	Enrollment - # Sections						Fill Rate						Wait Lists		
		F 09	S 10	F 10	S 11	F 11	S 12	F 09	S 10	F 10	S 11	F 11	S 12	S 12	F 12	S 13
ACR 101	20	29 - 1	20 - 1	45 - 2	35 - 1	16 - 1	22 - 1	145.0%	100.0%	125.0%	87.5%	80.0%	110.0%			
ACR 102	20		14 - 1		22 - 1	25 - 1	20 - 1		70.0%		110.0%	125.0%	100.0%			
ACR 103	20	24 - 1	26 - 1	17 - 1		25 - 1	19 - 1	120.0%	130.0%	85.0%		125.0%	95.0%			
ACR 104	20	26 - 1	17 - 1	17 - 1		18 - 1	13 - 1	130.0%	85.0%	85.0%		90.0%	65.0%			
ACR 105	20	26 - 1	18 - 1	14 - 1	15 - 1	13 - 1		130.0%	90.0%	70.0%	75.0%	65.0%				
ACR 106	20	20 - 1		21 - 1	14 - 1		13 - 1	100.0%		105.0%	70.0%		65.0%			
BLDC 130	16		15 - 1		26 - 1		13 - 1		93.8%		144.4%		81.3%			
EWIR 110	40	45 - 2	19 - 1	29 - 2	34 - 1	36 - 2		112.5%	95.0%	116.8%	85.0%	90.0%				
WELD 100	36	45 - 2	50 - 2	34 - 2	39 - 1	22 - 1	37 - 2	163.3%	138.9%	94.4%	108.3%	122.0%	102.8%			

ACR COURSES - PRODUCTIVITY

COURSE	FTES						FTEF						PRODUCTIVITY					
	F 09	S 10	F 10	S 11	F 11	S 12	F 09	S 10	F 10	S 11	F 11	S 12	F 09	S 10	F 10	S 11	F 11	S 12
ACR 101	4.97	3.43	9.43	6.00	2.74	3.77	0.20	0.20	0.40	0.20	0.20	0.20	24.85	17.15	23.58	30.00	13.70	18.85
ACR 102		2.40		3.77	4.29	3.43		0.20		0.20	0.20	0.20		12.00		18.85	21.45	17.15
ACR 103	4.11	4.46	2.91		4.29	3.26	0.20	0.20	0.20		0.20	0.20	20.55	22.30	14.55		21.45	16.30
ACR 104	4.46	2.91	2.91		3.09	2.23	0.20	0.20	0.20		0.20	0.20	22.30	14.55	14.55		15.45	11.15
ACR 105	1.78	1.23	0.96	1.03	0.89		0.13	0.13	0.13	0.13	0.13		13.69	9.46	7.38	7.92	6.85	
ACR 106	3.43		3.60	2.40		2.23	0.20		0.20	0.20		0.20	17.15		18.00	12.00		11.15
BLDC 130		4.11		7.13		3.57		0.20		0.20		0.20		20.55		35.65		17.85
EWIR 110	12.35	5.21	7.95	9.33	9.88		0.54	0.27	0.54	0.27	0.54		22.87	19.30	14.72	34.56	18.30	
WELD 100	13.89	15.43	10.49	12.04	6.79	11.41	0.66	0.66	0.66	0.33	0.33	0.66	21.05	23.38	15.89	36.48	20.58	

ACR COURSES - COMPLETION & SUCCESS RATES

	Completion Rate						Success Rate					
COURSE	F 09	S 10	F 10	S 11	F 11	S 12	F 09	S 10	F 10	S 11	F 11	S 12
ACR 101	93%	90%	100%	100%	75%	100%	83%	60%	95%	71%	75%	73%
ACR 102		93%		100%	80%	95%		79%		91%	68%	65%
ACR 103	92%	96%	88%		80%	95%	75%	85%	76%		52%	84%
ACR 104	100%	100%	88%		78%	100%	85%	100%	71%		61%	92%
ACR 105	92%	83%	100%	100%	46%		77%	72%	100%	87%	46%	
ACR 106	95%		95%	93%		100%	75%		86%	57%		100%
BLDC 130		100%		92%		100%		87%		85%		100%
EWIR 110	78%	74%	90%	68%	75%		75%	68%	65%	56%	72%	
WELD 100	92%	84%	85%	82%	68%	86%	80%	72%	53%	49%	45%	51%

Recent Enrollment Demand: High __X__ Medium _____ Low _____

Projection for Future Demand : Growing __X__ Stable _____ Declining _____

Opportunity Analysis: The Air Conditioning Program consists of six courses. In the same semesters between school years 2009-2012, the fill rate average was 99%, student success rate 78%, student completion rate 92%, and 33 Certificates were awarded to students. An Associate Degree is also available; many students are in progress of obtaining it. All courses are taught every two semesters.

The Air Conditioning Program has an active Advisory Community consisting of twenty members of the community and meets to discuss appropriate curriculum, technology, and state of the program. We are members of the Air Conditioning Contractors of American (A.C.C.A.) and North American Technician Excellence (N.A.T.E.) our curriculum is aligned with NATE. The Air Conditioning Program is a NATE training and testing facility. Students are prepared to take an ESSCO Refrigerant State Exam.

There are 71 job related employers in the Imperial Valley and presently at least 56 job openings within 100 miles as documented by the Employment Development Department, with 470 job openings projected between 2006-2016,(February 06, 2012 California Labor Market Information). There is a high demand occupation in the surrounding area.

In the near future a new class will be developed with emphasis on alternative energy. Currently the Certificate and A.S. Degree are tied in with the Building Construction Technology, Electrical Technology, and Welding Technology Departments to benefit a well prepared student. All students have to take courses in each of these departments to obtain an A.S. Degree.

Summary of Program "Health" Evaluation: The Air Conditioning Program has a high expectation of its students which results in a success rate of 78% and a completion rate of 92%. There is a high demand for this occupation in the surrounding area (100 miles) with a fill rate of 99%. The program is consistently productive with 33 Certificates awarded in school years 2009-2012.

There are students studying to receive an A.S. Degree.

There is student employment survey currently being taken and information is being collected to develop a job success ratio, which shows that employment could be close to 50%. Students

that have been tracked 50% of them are employed.
We have students employed at:

- Locke Air Conditioning
- Cool Breeze Air Conditioning
- Baker Refrigeration
- J & S Refrigeration
- Arctic Air Conditioning
- Lara Air Conditioning
- All Valley Air
- El Centro High School District
- El Centro Elementary District
- Holtville Elementary District
- Westmorland Elementary District
- Home Depot
- Lowes Lumber
- Border Patrol ICE
- Brawley Beef
- Imperial Valley Housing Authority
- Navy Base
- Greens Construction
- Bernal Construction
- Heber Elementary District
- Calexico High School District
- Imperial Valley College

To train student

Student Learning Outcomes and Program Learning Outcomes

ACR101

Outcome 1: Upon completion of this course the students will be able to perform a standing pressure test on a vessel using dry nitrogen.	Written Exam, Practical Exam with Skills	ISLO1, ISLO2, ISLO3, ISLO4, ISLO5
Outcome 2: Upon completion of this course, the students will be able to make connections with copper tubing using both low-temperature solder and high-temperature brazing material.	Written Exam, Practical Exam with Skills	ISLO1, ISLO2, ISLO3, ISLO4
Outcome 3: Perform a deep vacuum test using a high quality vacuum pump and an electronic vacuum gage.	Written Exam, Practical Exam with Skills	ISLO1, ISLO2, ISLO3, ISLO4

ACR 102

Outcome 1: Upon completion of this course, the students will be able to identify and describe various components in a typical air-conditioning system.	Written Exam, Practical Exam with Skills	ISLO1, ISLO2, ISLO3, ISLO4, ISLO5
Outcome 2: Upon completion of this course, the students will be able to take wet-bulb and dry-bulb temperature readings, determine relative humidity from the psychrometric chart, and use this information to determine the level of comfort from the ASHREA generalized comfort chart.	Written Exam, Practical Exam with Skills	ISLO2, ISLO3, ISLO4, ISLO5
Outcome 3: Check out components of an air-conditioning system for an orderly system start-up, one component at a time, and check each one to insure that it is operating correctly	Written Exam, Practical Exam with Skills	ISLO1, ISLO2, ISLO3, ISLO4

ACR103

Outcome 1: Make current voltage, and resistance readings, you will also determine the current voltage, and resistance of a circuit using OHM'S Law.	Written Exam, Practical Exam with Skills	ISLO2, ISLO3, ISLO4, ISLO5

Outcome 2: Follow the circuit in typical electric air-conditioning system and check the amperage in a low-voltage circuit.	Written Exam, Practical Exam with skills	ISLO2, ISLO3, ISLO5
Outcome 3: Make voltage and amperage readings on actual operating equipment using VOM. You will be able to do this under the supervision of your instructor.	Written Exam, Practical Exam with Skills	ISLO2, ISLO3, ISLO4, ISLO5

ACR 104

Outcome 1: Upon completion of this course, the students troubleshoot and electrical problems with the changing from cool to heat.	Written Exam, Practical Exam with Skills	ISLO1, ISLO2, ISLO3 ISLO4
Outcome 2: Be familiar with the components in an electric heating system and will be able to list the specifications for these components.	Written Exam, Practical Exam with Skills	ISLO1, ISLO2, ISLO3 ISLO4
Outcome 3: Identify and describe the typical components in an air-to-air heat pump system.	Written Exam, Practical Exam with Skills	ISLO1, ISLO2, ISLO3, ISLO4

ACR 105

Outcome 1: Upon completion of this course, the students will be able to demonstrate knowledge of calculations to apply mathematical formulas related to HVAC units.	Written Exam, Practical Exam with Skills	ISLO1, ISLO2, ISLO4
Outcome 2: Upon completion of this course the students will be able to use a duct chart to evaluate the duct size on a simple residential or commercial duct system for adequate airflow in heating or cooling cycles.	Written Exam, Practical Exam with Skills	ISLO1, ISLO2, ISLO3, ISLO4, ISLO5
Outcome 3: Use basic airflow measuring instruments to measure airflow from register and grilles	Written Exam, Practical Exam with Skills	ISLO2, ISLO3, ISLO4

ACR 106

Outcome 1: Upon completion of this course, the students will be able to demonstrate knowledge of safety practices required during the installation of HVAC/R duct system.	Written Exam, Practical Exam with Skills	ISLO2, ISLO3, ISLO4,
Outcome 2: Upon completion of this course, the students will be able to demonstrate knowledge of layout procedures for duct components.	Written Exam, Practical Exam with Skills	ISLO2, ISLO3, ISLO4
Outcome 3: Cut and form a simple layout pattern for a	Written Exam, Practical	ISLO1, ISLO2, ISLO3,

galvanized sheet metal air-conditioning square-to-round air ducts	Exam with Skills	ISLO4

Program Learning Outcomes Assessment:

Assessment will be completed during the spring of 2013.

1. Outcome #1: Demonstrate knowledge of OHSA safety practices required for repair and installation of air conditioning and refrigerant equipment.
   Est. Completion Date: Spring 2013 Way(s) to assess: Written exam, Lab exam.
2. Outcome #2: Demonstrate and understand practical and manipulative skills relates to HVAC/R industry.
   Est. Completion Date: Spring 2013 Way(s) to assess: Written exam, Lab exam.
3. Outcome #3: Demonstrate competency an mastery of the body-of-knowledge in employee responsibilities withing the HVAC/R industry.
   Est. Completion Date: Spring 2013 Way(s) to asses: Written exam

Success Rate of Student Learning Outcomes:

Shows that a majority of the students learn and understand the assignments they are given. This is based on completing written tests with a 70% or greater and lab assignments with 100% success. Hands on training are repeated until it can be accomplished correctly.

Success Rate of Program Learning Outcomes:

Success rate for program learning outcomes are in process of assessment.

Future Goals of Program

Imperial Valley College is currently building a new career technical building, We are scheduled to move in by fall 2014.The state of the art facility will benefit students with a good learning environment. Future goals include adding courses in renewable energy and commercial refrigeration and continue to offer morning, afternoon, night, and weekend Saturdays. Teach advance technology with the help of the HVAC advisory committee, local contractors, and suppliers. Another future goal that is being developed and in the process is creating a concept in tracking Career Technical Students.

Resource requests from annual program review

In order to grow the program and stay in touch with the latest technology, new equipment must be purchased to replace outdated units currently being used. Air conditioners now operate with smart features, and require laptop computers, or proper electrical instruments to troubleshoot and repair, refrigerants have also changed.

Currently the new HVAC lab does not have funding for adequate and sufficient equipment to teach using the latest technology available. It appears that funding reductions eliminated most equipment funding. In order to be successful the program will need to purchase or build new lab trainers, mock up units of heat pump air conditioners, heating units, and commercial refrigeration units.

With the growth of the program, we may also have a need to hire part-time faculty to accommodate student interest.