|  |  |
| --- | --- |
| AP Full Official  | Certificate of Achievement in Refrigeration and Air Conditioning Program |
| Campus | Pohnpei Campus | AP Review Submission Date | September 23, 2016 |
| Completed by | Bertoldo B. Esteban Jr. | AR Review Cycle | Fall 2014 - Spring 2016(2 cohorts) |
| **Program Goals** |
| Program goals are broad statements concerning knowledge, skills, or values that the faculty members expect the graduating students to achieve. |
| **A. Program Goal** Its primary purpose is to provide students with marketable entry-level skills in the refrigeration and air conditioning industry or any related field/career. It is designed to qualify students to take external licensure, vendor-based, or skill standards examinations in the field. If standardized external exams are not available in the field of study, the program prepares students at skill levels expected of employees in an occupation found in the local economy. **Program Learning Outcomes**1. Identify safety and occupational health requirements in the Refrigeration and Air Conditioning industry.
2. Use specified hand and power tools for Refrigeration and Air Conditioning.
3. Perform basic hand skills in maintaining Refrigeration and Air Conditioning system to a given specifications.
4. Read and interpret basic electrical drawing and symbols related to Refrigeration and Air Conditioning.
5. Perform basic troubleshooting and repair of domestic refrigeration and air conditioning units.
6. Participate in the Air Conditioning and refrigeration profession.
 |
| Program History |
| This section describes the history of the program. This includes the date and reason of implementation, significant milestones in the development of the program, and significant current activities. |
| **B. Program History** The program was created by recommendations of Pohnpei Campus Advisory Council to offer a certificate of achievement (COA) in refrigeration and air conditioning to train local students to acquire skills in installation, preventive maintenance and repair of the stated equipment and devices, which was a needed skill in the community and the local workforce. *Milestones:*2005 - One full time instructor was recruited to assist in designing the curriculum and offered courses on the same year. The first batch of refrigeration and air conditioning major are composed of twelve (12) new students.2007 – The program students were actively involved in the first Technology and Trade Exhibit event of the college. 2008 – The college purchased modern refrigeration and air conditioning instrument and equipment used for instructional purposes to improve the program. 2010 – The program had one graduate student to be part of the apprenticeship- training program under the USDOL, FSM education department and the college.2011 - Refrigeration and Air Conditioning Students Club (RACSC) was established with a mission of creating an open environment for refrigeration students to engage in professional and personal growth.2013 –The Office of Environment and Emergency Management (OEEM) of the FSM national government and COM-FSM Pohnpei Campus hosted the first “Good Practices in Refrigeration and Air Conditioning” Train the Trainers program in the Federated States of Micronesia. It was sponsored by the United Nation Environment Programme (UNEP) as part of the implementation of the Montreal Protocol here in the FSM.2014 – The Memorandum of Understanding between the FSM Office of Environment and Emergency Management and the College of Micronesia-FSM on Training and Capacity Building for the Management of Ozone Depleting Substances were sign by both parties.2015 – The COM-FSM Board of Regents approved the program modification for the Certificate of Achievement in Refrigeration and Air Conditioning to be effective Fall 2015 during their August 6-7, 2015 meeting in Pohnpei State. The modification is not implemented due to faculty workload issue.2016 – Re-established the RAC program advisory council. |
| Program Description |
| The program description describes the program, including its organization, relationship to other programs in the system, program design, degree(s) offered, and other significant features of the program, such as elements/resources for forward-looking new program contributions to the state’s economy, or specialized program accreditation. |
| **C. Program Description** This program is design to teach the students the principles of refrigeration and air conditioning. It is design to train students in installing, servicing and maintaining domestic and small commercial refrigeration systems.  |
| Program Admission Requirements |
| This section describes the requirements for admission into the program and other requisites. |
| **D. Program Admission Requirements** A student must be a high school graduate or GED certificate holder. Applicants must take the COM-FSM entrance test (COMET) and be accepted by the Admissions Board. Acceptance by the Admissions Board is based on the applicant’s score on the COMET and other criteria as defined by the Admissions Board. |
| Program Certificate/Degree Requirements |
| This section specifies the requirements for obtaining a certificate/degree in the program, including specific courses,, sequencing of courses, total credits, internships, practical, etc.  |
| **E. Program Certificate Requirements***Program requirements:****General Education Requirements:-----------14 credits***MS 104 Technical Math I (4)* *Pre-requisite: MS 094 or placed at MS 100 level for Math on COMET*

MS 106 Technical Math II (4)ESL 050 Technical English (3) or SS 100 World of Work (3)CA 095 Computer literacy (3)***Technical Requirements:*** ***-----------21 credits***VEM 105 Basic Electricity for A/C (3)VEM 110 Workshop Fabrication (3)VEM 111 Electrical Wiring I (3)VEM 113 Refrigeration I (4)VEM 114 Refrigeration II (4)VWE 115 General Welding (4)***Total credits requirements: 35 credits*****Suggested Schedule** **Fall Semester** ESL 050 Technical English or SS 100 World of Work........... 3 MS 104 Technical Math I............................................................ 4 VEM 105 Basic Electricity for A/C........................................... 3 VEM 110 Workshop Fabrication................................................ 3 VEM 113 Refrigeration I............................................................. 4 17 **Spring Semester** MS 106 Technical Math II........................................................... 4 VEM 111 Electrical Wiring I....................................................... 3 VEM 114 Refrigeration II............................................................ 4 VWE 115 General Welding......................................................... 4 15 **Summer Session** CA 095 Computer Literacy......................................................... 3 3*Note: The pre-requisite course causes an additional 4 credits from the regular 35 credits requirement of the program.* |
|  Program Courses and Enrollment |
| This section lists courses offered in the program, including number of sections, course enrollment, section fill rates, and redundancy of courses across the institution. |
| **F. Program Courses and Enrollment**Below are tables showing the program enrollment figures and number of sections:Fall Semesters 2014-15 and Spring Semesters 2015-16

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Fall Semester | Number of students | Number of sections | Spring Semester | Number of students | Number of sections |
| 2014 | 29 | 2 | 2015 | 25 | 3 |
| 2015 | 19 | 2 | 2016 | 14 | 3 |

***Note:*** *VEM 110/P5 for RAC students are not included in the report for Fall semesters and VEM 111 for Spring semesters. VEM 110 is a course offered to various programs including electronics, electrical, and RAC. Section P5 is specifically for the RAC program.**Source: RAC program data sheets Fall 2014-Spring 2016 IRPO.* |
|  Program Faculty |
| This section reports the faculty of the program, including full-time and part-time faculty. The degrees held and rank are provided for the full-time and part-time faculty. Finally, provide the faculty student ratio for the program. |
| **G. Program Faculty** Full Time Faculty Bertoldo Esteban Jr. – Associate Professor Bachelor of Science in Industrial Education  major in Refrigeration and Air Conditioning Technology Marikina Institute of Science and Technology, Philippines Master of Arts in Teaching (MAT) major in Electrical  Technology, Marikina Institute of Science and Technology, Philippines   Romino Victor – ------Assistant Professor Associate in Applied Science, College of Micronesia  Electrical Journeyman Certificate, US Dept. of Labor Alan Alosima – ------ Associate Professor BSCE, Manuel S. Everga University, Philippines  *Source: COM-FSM Personnel Listing*  |
|  H. Program Indicators |
| This section provides the data for analyzing the extent to which the program has achieved the established outcomes and criteria. This is the most important part of the program review. The data that will be collected and evaluated are the following: |
|  | **1. Assessment of course student learning outcomes of program courses**Number and Percentage of Students Scoring 70% or Higher on the Assessments

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Course & CSLO’s | Fall 2014 | Spring 2015 | Fall 2015 | Spring 2016 |
| VEM 105  | N= 15 | N= 9 | N= 10 | N=  |
| CSLO 1 | 10 (67%) | 3 (33%) | 10 (100%) |  |
| CSLO 2 | 10 (67%) | 7 (78%) | 10 (100%) |  |
| CSLO 3 | 10 (67%) | 6 (67%) | 10 (100%) |  |
| CSLO 4 | 14 (93%) | 7 (78%) | 10 (100%) |  |
| CSLO 5 | 14 (93%) | 7 (78%) | 10 (100%) |  |
| CSLO 6 | 14 (93%) | 7 (78%) | 10 (100%) |  |
| VEM 113 | N= 14 | N= | N= 9 | N=  |
| CSLO 1 | 13 (93%) |  | 9 (100%) |  |
| CSLO 2 | 13 (93%) |  | 9 (100%) |  |
| CSLO 3 | 13 (93%) |  | 9 (100%) |  |
| CSLO 4 | 14 (100%) |  | 9 (100%) |  |
| CSLO 5 | 14 (100%) |  | 9 (100%) |  |
| VEM 114 | N=  | N= 11 | N=  | N= 6 |
| CSLO 1 |  | 11 (100%) |  | 6 (100%) |
| CSLO 2 |  | 11 (100%) |  | 6 (100%) |
| CSLO 3 |  | 11 (100%) |  | 6 (100%) |
| CSLO 4 |  | 11 (100%) |  | 6 (100%) |
| CSLO 5 |  | 11 (100%) |  | 6 (100%) |
| CSLO 6 |  | 11 (100%) |  | 6 (100%) |
| VWE 115 | N=  | N= 12 | N=  | N= 6 |
| CSLO 1 |  | 11 (92%) |  | 6 (100%) |
| CSLO 2 |  | 11 (92%) |  | 6 (100%) |
| CSLO 3 |  | 11 (92%) |  | 6 (100%) |
| CSLO 4 |  | 12 (100%) |  | 6 (100%) |
| CSLO 5 |  | 12 (100%) |  | 6 (100%) |
| CSLO 6 |  | 12 (100%) |  | 6 (100%) |

*Notes: VEM 110 for RAC is not included in the Fall courses offering of the program from the data of IRPO.* |
|  | **2. Assessment of program student learning outcomes**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Program Outcome | Assessment Strategy | Target | Fall Results | Spring Results |
| 1. Identify safety and occupational health requirements in the Refrigeration and Air Conditioning industry. | Given the different types of HFC refrigerants, safety goggles, hand gloves and manifold gauge, the students will measure the standing pressure of each gasses and demonstrate safety procedures in handling high-pressure refrigerants. | 70% of all the students registered in this program must pass this PSLO. | **Fall 2015**9 out 9 students or 100% got a grade of "C" or better in the VEM\_113\_ CSLO4.**Fall 2014**14 out 14 students or 100% got a grade of "C" or better in the VEM\_113\_ CSLO4. |  |
| 2. Use specified hand and power tools for Refrigeration and Air Conditioning. |  | 70% of all the students registered in this program must pass this PSLO. | **Fall 2015**9 out 9 students or 100% got a grade of "C" or better in the VEM\_113\_ CSLO5.**Fall 2014**11 out 11 students or 100% got a grade of "C" or better in the VEM\_113\_ CSLO5. |  |
| 3. Perform basic hand skills in maintaining Refrigeration and Air Conditioning system to a given specifications. |  | 70% of all the students registered in this program must pass this PSLO. |  | **Spring 2016**6 out 6 students or 100% got a grade of "C" or better in the VEM\_114\_ CSLO3.**Spring 2015**11 out 11 students or 100% got a grade of "C" or better in the VEM\_114\_ CSLO3 |
| 4. Read and interpret basic electrical drawing and symbols related to Refrigeration and Air Conditioning.  |  | 70% of all the students registered in this program must pass this PSLO. | **Fall 2015**10 out 10 students or 100% got a grade of "C" or better in the VEM\_105\_ CSLO5.**Fall 2014**14 out 15 students or 93% got a grade of "C" or better in the VEM\_105\_ CSLO5. |  |
| 5. Perform basic troubleshooting and repair of domestic refrigeration and air conditioning units. |  | 70% of all the students registered in this program must pass this PSLO. |  | **Spring 2016**6 out 6 students or 100% got a grade of "C" or better in the VEM\_114\_ CSLO5.**Spring 2015**11 out 11 students or 100% got a grade of "C" or better in the VEM\_114\_ CSLO5 |
| 6. Participate in the Air Conditioning and refrigeration profession. |  | 70% of all the students registered in this program must pass this PSLO. |  | **Spring 2016**6 out 6 students or 100% got a grade of "C" or better in the VEM\_114\_ CSLO6.**Spring 2015**11 out 11 students or 100% got a grade of "C" or better in the VEM\_114\_ CSLO6 |

 |
|  | **3. Program enrollment (historical enrollment patterns, student credits by major)**Enrollment by Major and Campus

|  |  |
| --- | --- |
| TERM | ENROLLMENT/PNI |
| Fall 2014 | 17 |
| Fall 2015 | 16 |
| Spring 2015 | 18  |
| Spring 2016 | 14  |

Students Credits by Major and Campus

|  |  |
| --- | --- |
| TERM | CREDITS/PNI |
| Fall 2014 | 160.5 |
| Fall 2015 | 181 |
| Spring 2015 | 181 |
| Spring 2016 | 130 |

Students Credits by Programs and Campus

|  |  |
| --- | --- |
| TERM | CREDITS/PNI |
| Fall 2014 | 105 |
| Fall 2015 | 66 |
| Spring 2015 | 108 |
| Spring 2016 | 130 |

*Source: IRPO Program Data Sheet for 2014-15* |
|  | **4. Average class size** Program Sections, Enrollment Ratio and Average Class Size

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Term | Section | Enroll Max | Enrollment | EnrollRatio | AvgClass Size |
| Fall 2014 | 2 | 30 | 29 | 96.7% | 14.5 |
| Fall 2015 | 2 | 30 | 19 | 63.3% | 9.5 |
| Spring 2015 | 3 | 32 | 25 | 78.1% | 8.3 |
| Spring 2016 | 2 | 30 | 12 | 40.0% | 6.3 |

***Note:*** *VEM 110 for RAC students are not included in the report for Fall semesters and VEM 111 for Spring semesters.**Source: IRPO Program Data Sheet for 2014-15* |
|  | **5. Course completion rate**Course Completion & Withdrawals (Majors)

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Term | Students | ABCorP% | ABCDorP% | W\_% |
| Fall 2014 | 40 | 80% | 85% | 7.5% |
| Fall 2015 | 58 | 72.4% | 82.76% | 10.34% |
| Spring 2015 | 39 | 79.5% | 79.5% | 12.8% |
| Spring 2016 | 38 | 84.21% | 89.5% | 5.3% |

Course Completion & Withdrawals (Program)

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Term | Students | ABCorP% | ABCDorP% | W\_% |
| Fall 2014 | 30 | 90% | 90% | 3.3% |
| Fall 2015 | 19 | 100% | 100% | 0% |
| Spring 2015 | 27 | 92.6% | 92.6% | 7.4% |
| Spring 2016 | 12 | 100% | 100% | 0% |

Course Completion & Withdrawal Rate (Program Course)

|  |
| --- |
| Term: Fall 2014 |
| Course | Enroll | ABCorP | CC\_% | W\_% |
| VEM 105 | 15 | 14 | 93% | 6.6% |
| VEM 110 | 11 | 11 | 100% | 0% |
| VEM 113 | 14 | 14 | 100% | 0% |
| Term: Fall 2015 |
| Course | Enroll | ABCorP | CC\_% | W\_% |
| VEM 105 | 10 | 10 | 100% | 0% |
| VEM 110 | 9 | 9 | 100% | 0% |
| VEM 113 | 9 | 9 | 100% | 0% |
| Term: Spring 2015 |
| Course | Enroll | ABCorP | CC\_% | W\_% |
| VEM 111 |  |  |  |  |
| VEM 113 | 2 | 2 | 100% | 0% |
| VEM 114 | 11 | 11 | 100% | 0% |
| VWE 115 | 12 | 12 | 100% | 0% |
| Term: Spring 2016 |
| Course | Enroll | ABCorP | CC\_% | W\_% |
| VEM 111 |  |  |  |  |
| VEM 114 | 6 | 6 | 100% | 0% |
| VWE 115 | 6 | 6 | 100% | 0% |

***Note:*** *VEM 110 for RAC students are not included in the report for Fall semesters and VEM 111 for Spring semesters.**Source: IRPO Program Data Sheet for 2014-15* |
|  | **6. Student persistence and retention rate**Persistence and retention rate

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Degree | New FT Fall 2014 | Persisted Spring 2015 | Retained Fall 2015 | Persistence Spring 2015 | Retention Fall 2015 |
| CA | 4 | 4 | 6 | 100% | 150.0% |
| Degree | New FT Fall 2015 | Persisted Spring 2016 | Persistence Spring 2016 |  |  |
| CA | 2 | 1 | 50% |  |  |

*Source: IRPO Program Data Sheet for 2014-15* |
|  | **7. Success rates on licensing or certification exams (CTE, TP, Nursing, etc)**There is no certification exam for our graduates develop yet, however with our collaboration with the OEEM, we are discussing the possibility of giving a licensure examination to all the refrigeration and air conditioning mechanics/technicians in the country to support to the implementation of Montreal Protocol. |
|  | **8. Graduation rate based on yearly number**Graduation Rate

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| Major | Degree | Cohort | New FT Students | Grad\_100\* | Grad\_150\* | Grad\_200\* |
| RAC | CA | Fall 2014 |  |  |  |  |
| RAC | CA | Fall 2015 |  |  |  |  |
| RAC | CA |  |  |  |  |  |

**Graduates by Major**

|  |  |  |  |
| --- | --- | --- | --- |
| Major | Degree | AY14/15 | AY15/16 |
| RAC | CA | 1 | 4 |

*Source: IRPO Program Data Sheet for 2014-15* |
|  | **9. Students seat cost** |
|  | **10. Cost of duplicate or redundant courses, programs or services** |
|  | **11. Students’ satisfaction rate**  Data below are obtained from students evaluation

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Course | Fall 2014 | Spring 2015 | Fall 2015  | Spring 2016 |
| VEM 105 | 4.6 | n/a | 4.6 | n/a |
| VEM 110 | 4.4 | n/a | 4.4 | n/a |
| VEM 113 | 4.2 | n/a | 4.2 | n/a |
| VEM 114 | n/a | 4.2 | n/a | 4.2 |
| VWE 115 | n/a | 4.0 | n/a | 4.0 |

1 = Never 2 = Rarely 3 = Sometimes 4 = Usually 5 = Always1. Keeps regular schedule, every class day.
2. Shows interest in the subject.
3. Gives individual help as needed.
4. Avails himself/herself for student conference.
5. Welcomes questions, suggestions and discussions from students.
6. Shows interest and respect for students.
7. Helps the students in meeting individual learning needs.
8. Uses classroom/lab time fully.
9. Provides clear directions for assignment and instruction.
10. Grades fairly and frequently.
11. Makes the purpose of the course clear.
12. Talks clearly and at an easy-to-follow speed.
13. Lessons are well paced with activity as well as lecture.
14. Makes the course interesting.
15. Textbooks were appropriate and helpful.
 |
|  | **12. Alumni data** Degree: Certificate of Achievement in Refrigeration and Air Conditioning

|  |  |  |
| --- | --- | --- |
| Name/Graduates | Year Graduated | Municipality |
| Augustine Augustine |  | Kitti |
| Wiener Hinga | Spring 2009 | Netts |
| Jimmy Silbanuz | Fall 2009 | Madolehniwmh |
| Wendolin Lainos | Fall 2009 | Netts |
| Prenston Ioanis | Summer 2009 | Kitti |
| Michael Leo Francisco | Spring 2012 | Ouh |
| Mills Poll |  | Kitti |
| Jeffry Joseph |  | Kitti |
| Nelsiro George |  |  |
| Ryan Weital | Spring 2016 | Ouh |
| Arcin David | Spring 2016 | Kapinga island |
| Darson Noah | Spring 2016 | Kapinga island |
|  |  |  |

 |
|  | **13. Employment data and employer feedback (employer survey)**

|  |  |
| --- | --- |
| Name/Graduates | Employer |
| Prenston Ioanis | 4 TY Store/RAC Technician |
| Augustine Augustine | COM-FSM, Pohnpei Campus/RAC Technician |
| Jimmy Silbanuz | COM-FSM, Pohnpei Campus/Building Maintenance |
| Nelsiro George | COM-FSM, National Campus/RAC Technician |
| Alexie Sailas | Micro PC, Kolonia |
| Steward Paulus | Black Sand, Nett |

 |
|  | **14. Program at nearby regional institutions** **Refrigeration and Air Conditioning Technology****Honolulu Community College****Refrigeration & Air Conditioning Technology** RAC **Degree That Can Be Earned:** Certificate of Achievement (CA) Associate in Applied Science (AAS) **Brief Program Description/Goals:** Students will gain both the technical knowledge and the hands-on skills necessary to becoming an efficient and successful refrigeration and air conditioning technician. Students are prepared to pass the (Environmental Protection Agency) EPA Refrigerant Handling Certification. This certification is necessary for work in the field. **What Is Unique About The Program:** • Honolulu CC serves as the State of Hawai‘i’s exclusive provider of college level training in Refrigeration and Air Conditioning Technology. **Itemized Estimate of Educational Costs:** • Tuition based on total number of credits taken. • Books and tools approximately $800. **Program Prerequisites or Co-requisite:** • ENG 19 and/or ENG 21, OR “C” or higher in ESL 11 & 13 & 14, OR Placement in ENG 22/60 or ESL 23 • MATH 9, OR Placement in MATH 50. Check for the possible competitor among other nearby colleges |
|  | **15. Transfer rate**Most of the graduates in the program are transferring to our AAS Building Technology major in Electricity. |
|  Analysis |
|   | **Findings**This section provides discussion of information discovered as a result of the evaluation such as problems or concerns with the program and what part of the program is working well and meeting expectation.**1. Assessment of course student learning outcomes of program courses*** All CSLO’s were assessed on time and met the targets.
* The program offerings are outdated; we need to cope up with the changes in the trade due to the ozone protection and climate change phenomenon.
* Based in the program data sheets from the IRPO, the VEM110/P5 and VEM 111 courses are not included into the program sections and enrollment by credits report.

**2. Assessment of program student learning outcomes*** All PSLO’s were assessed on time and met the targets.

**3. Program enrollment*** VEM 110/P5 for RAC students are not included in the report for Fall semesters and VEM 111 for Spring semesters.

**4. Average class size*** The minimum of ten students per course during Spring 2015, Fall 2015, and Spring 2016 were not met.

**5. Course completion rate*** There were a high course completion rates from all students who registered in all the program courses.

**6. Student persistence and retention rate*** There is a good persistence and retention rate during AY2014-AY2015.
* Most students are stopped attending school once they finished their technical courses requirement.

**7. Success rates on licensing or certification exams** * There is no certification exam for our graduates develop yet, however with our collaboration with the OEEM, we are discussing the possibility of giving a licensure examination to all the refrigeration and air conditioning mechanics/technicians in the country to support the implementation of Montreal Protocol.

**8. Graduation rate based on yearly number*** There is 1 student graduated during AY14/15 and 4 students during AY15/16.

**9. Students seat cost*** No data

**10. Cost of duplicate or redundant courses, programs or services*** No data

**11. Students’ satisfaction rate** * There were very good satisfaction rate based on the students course evaluation conducted during the period of this program review.

**12. Alumni data** * There were 12 alumni of this program since it was started in Fall 2005.

**13. Employment data and employer feedback (employer survey)*** There were 6 graduates in the program that are currently working in the refrigeration and air conditioning field.

**14. Program at nearby regional institutions** * Honolulu Community College serves as the State of Hawai‘i’s exclusive provider of college level training in Refrigeration and Air Conditioning Technology.

**15. Transfer rate*** Most of the graduates in the program are transferring to our AAS Building Technology major in Electricity.
 |
|   | RecommendationsThis section provides recommendations from the program on what to do to improve or enhance the quality of program and course learning outcomes as well as program goals and objectives. This section should also include suggestions that describe how the program might be able to create opportunities for a better program in the future. Some examples are exploring alternate delivery mechanisms, forming external partnerships, or realigning with other programs.* I recommend that we must start using the approved program curriculum. By doing this we can improve the quality of our program and we can assure our local employers that our graduates are capable to work in their field of specialization.
 |

*Draft submission: May 12, 2016*

*Final draft submission:*