

HAWAI'I COMMUNITY COLLEGE PROGRAM ANNUAL REVIEW REPORT

ELECTRICAL INSTALLATION AND MAINTENANCE TECHNOLOGY PROGRAM

**Review Period
July 1, 2014 to June 30, 2015**

**Initiator: JOEL TANABE
Writers: PATRICK C PAJO
Renee Delacruz**

Program/Unit Review at Hawai'i Community College is a shared governance responsibility related to strategic planning and quality assurance. Annual and 3-year Comprehensive Reviews are important planning tools for the College's budget process. This ongoing systematic assessment process supports achievement of Program/Unit Outcomes. Evaluated through a college-wide procedure, all completed Program/Unit Reviews are available to the College and community at large to enhance communication and public accountability. Please see <http://hawaii.hawaii.edu/program-unit-review/>

Program Description

This program prepares students for employment with electrical appliance shops, utility companies, and electrical construction and maintenance companies. Learning will center on planning, designing, constructing, installing, and maintaining electrical wiring and equipment.

The EIMT Program educates traditional, non-traditional, underrepresented gender groups, and underrepresented groups.

The EIMT Program is historically a popular trade program that has a large number of individuals who are eager to learn what the program has to offer. The EIMT Program has produced many responsible individuals who are employed in the construction and maintenance fields. Many graduates are entrepreneurs who employ present day graduates of HawCC EIMT Program.

The following explanations are an articulation of the National Curriculum on Electricity which is the key to the EIMT Program's accomplishments:

First semester:

This course is an introduction to basic knowledge of electricity which is essential for proper applications and delivery of electricity. Basic electron theory, conventional theory, ohm's law, power law, magnetism, electromagnetism, batteries, and types of conductor properties will be emphasized. Safety and usage of hand / power tools, and equipment utilized in construction and maintenance industries will be emphasized.

Second semester:

This course is an introduction to the interpretation and purpose of the National Electrical Code (National Fire Protection Association [NFPA 70].) Methods of reading and interpreting blueprints will be practiced to understand residential wiring systems and circuitry applications. Prior knowledge of basic electricity, e.g. series, parallel, and series / parallel circuits will be articulated. Safety and usage of hand / power tools, and equipment utilized in construction and maintenance industries will be emphasized.

Third semester:

This course covers methods of reading and interpreting blueprints practiced in commercial wiring systems and circuitry applications. The fundamentals and purpose of grounding electrical systems will be covered. Electrical conduit bending and installations with conductor selection and applications will be covered and practiced. Safety and usage of hand / power tools, and equipment utilized in construction and maintenance industries will be emphasized.

Fourth semester:

This course covers fundamentals of power generation, power transmission, and power distribution; Single-Phase and Poly-Phase Step-Up Power Transformers, Step-Down Power Transformers, and Buck / Boost Power Transformers. Fundamentals and theories of

Magnetism and Electromagnetism will be covered to illustrate power transformers, Single-Phase Motors, Three-Phase Motors, and Motor Controls. Basic understanding of Photovoltaic Power Systems will be introduced. Safety and usage of hand / power tools, and equipment utilized in construction and maintenance industries will be emphasized.

Part I. Review of Program Data

Go to the Annual Reports for Program Data (ARPD) website linked below and review the data for your program.

<http://www.hawaii.edu/offices/cc/arpd/>

Part II. Analysis of the Program

Demand Health UNHEALTHY	Efficiency Health HEALTHY	Effectiveness Health HEALTHY
<p><i>Demand Indicators are based on the (number of majors) divided by the (number of New and Replacement Positions of County) during fall and spring.</i></p> <p><i>The benchmark for “Healthy” is within 1.5-4.0.</i></p> <p><i>Within the Program Years 2012-13, County New & Replacement Positions were at a low, at 5. 2013-2014 Positions were at 27. Currently 2014-15 remained at 27. As a result, Demand Indicators within 2014-2015 is at an “Unhealthy” status.</i></p> <p><i>Demand Health started with a “Healthy” status in the first 2 Program Years and is presently at an “Unhealthy” status. The Demand Health is unhealthy due to the high demand in “New & Replacement Positions (State).”</i></p> <p><i>Although the Demand Health is at an unhealthy status, the Program historically attracts</i></p>	<p><i>Efficiency Indicators are based on the <u>Fill Rate</u> that is calculated by the (number of seats filled) divided by the (maximum seats offered) during Fall and Spring Program Years.</i></p> <p><i>The benchmark for “Healthy” is within 75-100%.</i></p> <p><i>Over the past 3 Program Years, the Efficiency Health maintains a “HEALTHY” status.</i></p> <p><i>The Fill Rate remains at a “Healthy” status.</i></p>	<p><i>Effectiveness Indicators are based using 3 measures:</i></p> <p><i>1- (Unduplicated Degrees/Certificates Awarded) divided by (Majors.)</i></p> <p><i>2- (Unduplicated Degrees/Certificates Awarded) divided by (Annual New and Replacements Positions of County.)</i></p> <p><i>3- Persistence Fall to Spring.</i></p> <p><i>The benchmark for “Healthy” is greater than 20%.</i></p> <p><i>Over the past 3 Program Years, the Effectiveness Health maintained a “HEALTHY” status with a percentage of more than the 20% benchmark in each Program Year.</i></p>

<i>new students each Academic Year with an impressive number of students waiting to enter.</i>		
---	--	--

Overall Health

“CAUTIONARY”

Part III. Action Plan

Include, in the EIMT Curriculum, a mock two bedroom single-family dwelling as a hands-on teaching tool to practice repetition on electrical installation and maintenance in residential, commercial, and industrial wiring. This structure will be utilized in all four curriculums.

This structure will be built on campus almost complete without interior walls. Each individual student will touch all areas of roughing-in and finishing electrical installations by practicing in repetitions. As the saying goes, “practice-practice-practice...makes perfect!!”

With the roof installed, “practice with repetition” will be performed by each individual student on installing and maintaining photovoltaic equipment. Safety measures and practices will be taught for working on elevated platforms.

The rationale of this strategy is for the students themselves being competent in performing actual installations on the actual model home (capstone in the 4th semester) with the feeling of trust and confidence in themselves.

More importantly, electrical installation and maintenance is a “specialty field” in which all work is to be done by a licensed electrician with a minimum of 10,000 hours of field experience including apprenticeship practices in residential, commercial, and industrial wiring to perform such tasks. This is a tremendous responsibility of the EIMT Instructors having in possession an Electrical Contractors License and a Supervisors License registered with the DCCA PVL State of Hawaii on their person. The licensed contractors’ signature and all its bonding requirements are included in Electrical Permits. Licenses used on the model home are personal possessions. Unlike all other construction trades instructors at HawCC who is not required to possess any type of DCCA PVL License when participating with the model home project at HawCC. With that said, this strategy will lessen the personal load that the EIMT Instructors carry. “Peace of Mind”

The EIMT Program Instructors will proudly explain to the DHHL and home owners the teaching methods of “practice-practice-practice...makes perfect...with repetition!!” with the use of the mock model home at the dedication ceremony.

Part IV. Resource Implications

Description	Type <ul style="list-style-type: none"> • Personnel • Facilities • Equipment • Health/Safety • Others (Define) 	Estimated Cost
<p><i>HPM Building Supply two bedroom single-family dwelling—model “HUAKA” is to be purchased and built on HawCC Campus.</i></p> <p><i>Labor to build “practice structure.”</i></p>	<p><i>Training Facility</i></p> <p><i>Outside Building Contractor</i></p>	<p><i>\$60,000</i></p> <p><i>\$30,000</i></p>
Description	Type <ul style="list-style-type: none"> • Personnel • Facilities • Equipment • Health/Safety • Others (Define) 	Estimated Cost
<p><i>Mobile photovoltaic training kits.</i></p>	<p><i>Training Equipment</i></p>	<p><i>\$20,000</i></p>
Description	Type <ul style="list-style-type: none"> • Personnel • Facilities • Equipment • Health/Safety • Others (Define) 	Estimated Cost
<p><i>Ford F350 Diesel Super Duty with extended cab, short bed (w / spray-on bed liner), aluminum tool box, and aluminum System One pipe racks (w / strapping &</i></p>	<p><i>-Equipment</i></p> <p><i>-Health/Safety</i></p>	<p><i>\$65,000</i></p>

<i>ratchets).</i>		
-------------------	--	--

Part V. Comprehensive Review Information

The updated comprehensive review will improve the integrity of the EIMT Program which was damaged by the interference of the Chancellor being dictatorial of the EIMT Program.

Required for ARPD Web Submission: Provide the URL to the specific location of this Unit's last Comprehensive Review on the HawCC Program/Unit Review website (see link on page 1):

Part VI. Program Student Learning Outcomes

For all parts of this section, please provide information based on the PLOs (P-SLOs) that were assessed through PLO-aligned course assessments in AY 2014-15.

A) Evidence of Industry Validation (CTE Programs)

I've (Renee DelaCruz) hosted the past two EIMT Advisory Council meetings and have been transparent with members of our ongoing changes of upgrading the requirements of the Electives for the AAS degree. I've (Renee DelaCruz) invited some of the members to assist in Assessment activities for rating our students "Artifacts". I've (Renee DelaCruz) been working closely with three consistent members on numerous "Artifacts". Please see Minutes Of Advisory Meetings. (Attached)

CTE Program Advisory Council Meeting

February 19, 2015

4:00-6:00pm

EIMT – Renee Dela Cruz

In attendance:

Gerard Callo

John Mattos
Miles Nagato
Gene V.
Troy

1. Assessment:

- No report yet
- Still collecting assessment for this semester
- Last assessment had good outcome
- A difference when students comes from a program to no program

2. Review of Courses and Curriculum:

- CIP Code (job development on a title)
 - did not line up and changed
 - changed and healthy now in all categories
 - more realistic
- Webinars and Seminars are very important
- Math is also important
 - hard time converting
 - basic math
- AAS degree, education and work in private industry

3. Industry Report:

- Communication Network
- LED
- PV
- Stand alones (battery system) not yet

Note taker – Lori Medeiros

B) Expected Level of Achievement

For each Course assessed in AY 2014-15: Discuss the rubric(s) standards and the benchmark goal(s) for student success (e.g., “85% of students will achieve Excellent or Good ratings in the assessed activity” or “90% of students will score Meets or Exceeds Standards on the assessment rubric”).

EIMT 20 “90% of students will score Meets or Exceeds Standards on the assessment rubric”

C) Courses Assessed

List all Program Courses assessed during AY 2014-15. Also list Program Courses for which a follow-up “Closing the Loop” assessment was implemented in AY 2014-15.

Assessed Course Alpha, No., & Title	Semester assessed	PLO-aligned CLOs that were assessed
<i>EIMT 20, CRN 17692</i>	<i>Fall 2014</i>	<i>Temporary Pole</i>
		<i>PLO: 3,6,7,8</i>
<i>EIMT 22, CRN 18086</i>	<i>Spring2015</i>	<i>Junction Box Splicing</i>
		<i>PLO: 1,2,3,4,7,8</i>
“Closing the Loop” Assessments Alpha, No., & Title	Semester assessed	PLO-aligned CLOs that were assessed
<i>EIMT 20, CRN 17692</i>	<i>Fall 2014</i>	
<i>EIMT 22, CRN 18086</i>	<i>Spring2015</i>	

D) Assessment Strategy/Instrument

For each Course assessed in AY 2014-15, provide a brief description of the assessment strategy, including the type of student work or activity assessed how and when the assessment was conducted, how and why assessed artefacts were selected, and how the artefacts were analyzed.

AY 2014: EIMT 20 Fall 2014 CRN #17692, Instructor: *Renee AK Dela Cruz.*

A temporary Service Pole was used as an artifact to be assessed. This lab is usually conducted in the Fall semester to prepare the student's to do an actual “Temporary Service Pole Stand” installation, at the DHHL Model Home Project site. This exercise displayed their comprehension on National Electrical Code Book requirements (NEC), HELCO's Electrical Installation Service Manual (EISM) that was discussed in lecture. Assessors were given the opportunity to randomly select and inspect a completed Temporary Service Pole Stand and also observe students working in lab.

A rubric was created and used to grade the Temporary Service Pole Stand project. The rubric included simple check off boxes to rate the student's performance & observance of students

working in lab, along with a side commentary box. Assessors included two current EIMT Advisory Committee Members along with one past EIMT Instructor and three current HELCO Engineering Inspectors.

AY 2015: EIMT 22 Spring 2015 CRN # 18086, Instructor: Renee AK Dela Cruz.

The DHHL Model Home wiring is usually conducted in the beginning of Spring semester. All students conducted a practice splice "Junction Box" that was in preparation for the actual splicing conducted for the DHHL Model Home # 48. These splice junction boxes was used as artifacts, along with observance of students working at the Model Home.

All eight assessors had visited the Model Home while students were working on the rough in portion. Assessors randomly selected unmarked splice Junction Boxes and graded the artifacts by using a created rubric. The rubric categorized competency levels with a side commentary box. Assessors also walked around the site to observe the students during the rough in phase. Assessors consisted of three EIMT Advisory Council Members, two retired EIMT Instructors and three current Electrical Contractors.

E) Results of Program Assessment

For each Course assessed in AY 2014-15, provide a summative description of the assessment results. Discuss how these results collectively demonstrate achievement of the Program's Learning Outcomes and support the College's Mission.

AY 2014: EIMT 20 Fall 2014 CRN #17692, Instructor: Renee AK Dela Cruz.

The expected level of achievement was set at 85-90%. Although the results returned at one percent below expected outcome at 84%, I feel that the students did a thorough job. There were three HELCO Engineering Inspectors that had submitted five "N/A's", which added no scoring points. On the bright side, I feel that the scoring of "Does Not Meet Expectation = 1" would be more of a concern of dissatisfaction, rather than the "N/A" selection (that were chosen). Two out of the three HELCO inspectors were Junior Engineering Inspectors that are fairly new and/or is still in training. Two out of three of the HELCO inspectors does not have electrical training or back ground. One of the Junior Inspectors came through our program many years ago, but may not be currently active in the field. On the next assessment for Fall,

I will run this assessment again, but concentrate on inviting more trade field assessors to dominate the ratio of the assessor pool.

By participating in the DHHL Model Home Project collaborate with other Hawaii Community College programs, portrays the Kauhale Spirit by educating and co-existing, working together in unity. We as a Kauhale ohana in unison, contribute our gleaned skills and knowledge with our local community, the Department of Hawaiian Home Lands community.

AY 2015: EIMT 22 Spring 2015 CRN # 18086, Instructor: Renee AK Dela Cruz.

The maximum rated points from the rubric was 800. I had received 726 points that resulted in a 90% outcome. I am pleased with the results and do not feel that there is a “weakness”. The lowest scores received was “Developing to Meet Expectation” based on two points, which is understandable for students who are in training. Having the comments from the assessors validates my effectiveness as an instructor.

Comments received:

- ~ *“Student exhibits full understanding of circuitry and wiring methods, code requirements.”*
- ~ *“Instructor Renee does a good job in teaching the basic to the students.”*
- ~ *“Student clearly exceed minimum entry level skills. They understand and demonstrated the task.”*
- ~ *“Student demonstrated that they are learning and developing skills for their trade. They’ve developed these traits thru the teachings of the instructor and together, they seems to be enjoying this course. I was impressed with the student’s skills and knowledge. My assessment was accomplished primarily through question and answer method demonstration by students and visual inspection.”*

Both of these assessments would be striving in support of the College’s Mission of “E ‘Imi Pono”, seeking excellence in the skills instilled into the students through rigorous lab assignments developed by lecture and discussions infused with critical thinking, in turn developing viable Electrical Apprentices, upon graduating from the EIMT program.

F) Other Comments

Include any additional information that will help clarify the assessment results. Include comparisons to any applicable College or Program standards, or to any national standards from industry, professional organizations, or accrediting associations. Include, if relevant, a summary of student survey results, CCSSE, e-CAFE, graduate-leaver surveys, special studies, or other assessment instruments used.

Currently, Hawaii Community College is the only Community College participating in a DHHL Model Home Project that is advantageous for the students and to the local Hawaiian Community, as well. Students get to experience a live job site that their profession will expect them to be familiar with. This project exposes the students to: working alongside with other trades on site, meeting with inspectors from HELCO and County departments, applying real hands on electrical installations from ground up to the roof, exposure to a tight time management schedule that no simulated lab built on campus can ever come close to replicating.

G) Next Steps

Based on the Program's overall AY 2014-15 assessment results, describe the Program's intended next steps to enhance instruction in order to improve student learning. Instructional changes may include, for example, revision to curriculum, teaching methods, learning outcome statements, student support, and other options. Please note here if proposed changes will involve Program and/or Course modifications requiring approval.

Approximately 10 years ago in 2005, an individual's personal decision to have the EIMT students not participate in the DHHL Model Home project resulted in a 6 year halt of EIMT's involvement of the project. In 2011, I (Renee AK Dela Cruz) had incorporated the DHHL Model Home project into my assigned course(s) of instruction that covers Electrical Residential Wiring, for Fall EIMT 20 and Spring EIMT 22. Reuniting the EIMT program back into the DHHL Model Home project was a "revision" that aligned with the college course catalog. Prior to the disassociation of the DHHL Model Home project, the project was implemented in the third and fourth semester. This did not align with the college course catalog listing for the EIMT program.

Due to personal conflicts, changes have been made in reforming the EIMT program into two separate cohorts. One of them being, is that this current semester, a separate cohort has been formed and administration has coordinated for the Model Home to be conducted in the third and fourth semester for EIMT students, instead of first and second semester. NOTE: Third Semester covers "Commercial" installation and fourth semester covers "Industrial" and Photovoltaics systems. Hence, a revision in curriculum would be needed to align with the course catalog and CLO's. Traditionally the DHHL Model Home was implemented in the third and fourth semester for EIMT AAS registered students, but had never corresponded to the college's course catalog.

By moving the Model Home project back to the third and fourth semester, the EIMT students should retain more information in the residential wiring area upon graduation. Majority of our graduates had/will find job placements in the residential sector.

Part VII. Cost Per SSH

Please provide the following values used to determine the total fund amount and the cost per SSH for your program:

General Funds	= \$	_____
Federal Funds	= \$	_____
Other Funds	= \$	_____
Tuition and Fees	= \$	_____

Part VIII. External Data

If your program utilizes external licensures, enter:

Number sitting for an exam	_____
Number passed	_____

[If your program does not utilize external licensures, skip Part IX.]