

**HAWAI'I COMMUNITY COLLEGE**  
**COMPREHENSIVE PROGRAM REVIEW (CPR)**

**Diesel Mechanics Program**

Date: March 6, 2019

3-Year Review Period:

July 1, 2015 to June 30, 2018

AY15-16, AY16-17 and AY17-18

Initiator: Harold Fujii

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*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/files/program-unit-review/>*

*Please remember that this review should be written in a professional manner. Mahalo.*

## PART I: PROGRAM DATA AND ACTIVITIES

### Program Description

Provide the short program description as listed in the current catalog.
This program prepares the student for employment as a skilled tradesperson who troubleshoots, maintains, and repairs various types of diesel engines, trucks, tractors, boats, and other heavy equipment.

### Previous Comprehensive Program Review Information

Provide the year and URL for the location of this program’s last Comprehensive Program Review on the HawCC Program/Unit Review website: <a href="http://hawaii.hawaii.edu/files/program-unit-review/">http://hawaii.hawaii.edu/files/program-unit-review/</a>	
Year	2015
URL	<a href="http://hawaii.hawaii.edu/files/program-unit-review/docs/2015_disl_comprehensive_program_review.pdf">http://hawaii.hawaii.edu/files/program-unit-review/docs/2015_disl_comprehensive_program_review.pdf</a>
<p><b>Provide a short summary of the CERC’s evaluation and recommendations from the program’s last Comprehensive Review.</b></p> <p><b>Discuss any significant changes to the program that were aligned with those recommendations but are not discussed elsewhere in this report.</b></p>	<p><u>SUMMARY OF CERCS RECOMMENDATIONS:</u></p> <p>CERC’s evaluation and recommendations for the last Comprehensive Reviews for AY 13,14 &amp;15 are as follows:</p> <ol style="list-style-type: none"> <li>1. The review’s statements of alignment of the ILOs was very brief and overly general.</li> <li>2. Lack of discussion of how course assessment results demonstrate that students are meeting the program’s PLOs.</li> <li>3. No discussion of how the program intends to improve students learning.</li> <li>4. Program’s goals were “business as usual” and did not cover the program’s goals for improvement, growth, and development.</li> </ol> <p>*In general, CERC’s recommendations were to more seriously address the overall achievement of the program’s learning outcomes and provide a more</p>

comprehensive discussion of its assessments, and reconsider our approach for planning for improvement.

1. The program has taken seriously recommendations from CERC. In aligning the CLOs and PLOs to the ILOs. There was very little discussion in the previous assessments concerning ILO alignment, and the program has addressed the ILO alignments in its AY 17-18 APR, see discussion pp. 30-31:

[http://hawaii.hawaii.edu/files/program-unit-review/docs/2018\\_dimc\\_program\\_review.pdf](http://hawaii.hawaii.edu/files/program-unit-review/docs/2018_dimc_program_review.pdf)

2. CERCs second recommendation was that the assessments need to demonstrate that students are meeting the program's PLOs. This was addressed in the various meetings with the assessment coordinator, and the instructor, and with the assessment coordinator's assistance, all PLOs were re-aligned to the CLOs and all rubrics and lab-task sheets were revised in order to show how students are in fact meeting the program's CLOs. Also, because of the curriculum changes that were made in combining of two of the courses, the changing of all the CLOs, and the re-alignment all of the CLOs, PLOs and ILOs, the rubrics, lab task sheets, and alignments were revised a second time. The program will continue to modify the assessments as needed with the help of the Assessment Coordinator. Currently, in the assessment results, if a student meets the benchmark of a CLO, those results will contribute to the student meeting the PLO. In two courses, DIMC140 and DIMC 150, each CLO is numbered and aligns to each PLO with the same number so that they mirror each other. In the other two courses, DIMC 120 and 130, the wording is mirrored, and most of the numbering as well. This makes assessment outcomes easy to read and easy for students to understand. Every ILO is aligned to at least three of the program's CLOs except for ILO 6, which is only aligned to one CLO. See "curriculum changes" under "Program Activities" page 17 of this report.

	<p>3.The program has addressed plans for improving student learning in the AY17 and AY18 APRs by researching the implementation of scholarships where incoming students receive training in high school before entering the program, and by working with industry on internships; these expanded learning opportunities have already been discussed and are in the works with a few of the local companies on our island. The program faculty also have created CDL and simulated driving experiences with the goal of aiding in the success of the students and increasing the level/depth of their achievement of the course and program learning outcomes. The instructor has also modified teaching methods with more “hands-on” instruction in beginning of the semester due to the results of the learning outcomes assessments and some of the eCafe comments.</p> <p>Overall, the program’s goals have been growing, and the comments from CERC that we need to address these goals, and not just the “business as usual” type goals have been taken seriously. The program intends to outline goals more descriptively, and to include all goals even if they may not be achieved right away, or at all. By including all of our goals, the program can revisit, modify and hopefully witness the success of achieving them.</p>
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**ARPD DATA: Analysis of Quantitative Indicators**

Program data can be found on the ARPD website: <http://www.hawaii.edu/offices/cc/arpd/>

Please attach a copy of the program’s data tables for the three years under review and submit with this Comprehensive Program Review (CPR).

**Analyze the program’s ARPD data for the 3-year review period.**  
**Describe, discuss, and provide context for the program’s AY16 through AY18 data, including the program’s health scores in the Demand, Efficiency, Effectiveness and Overall Health categories.**

**DEMAND INDICATORS**

Over the past three years, the Diesel Mechanic Program’s demand indicators have shown the program to be “unhealthy” and “cautionary” and “cautionary.”

In AY 15-16, 89% of our graduates found work in the mechanics field. Two of those 17 became drivers of Diesel Trucks, and one of those 17 graduates became a mechanic in an automotive shop. Out of the total 17 students who found work in their field, all but three work here locally in Hilo HI. This shows that there were 14 jobs available for our students locally, not the reported 8.

In AY 16-17 the Diesel Mechanics Program had no graduating students for Spring 2016 because it is a two-year program, but there were still five students who were placed in diesel mechanic employment positions locally and with the recommendation from the instructor while attending their first year of school.

In AY 17-18 we tracked our graduates of SP 2018 and found that that there were more than 20 jobs available for our students locally on Hawaii island, both in Hilo and in Kona, which is higher than the ARPD data which is 9, giving us a truer number and a better Health Call.

The current \*New & Replacement Positions (County Prorated) data that pertains to this report for the past three years has been only showed 8 or 9 jobs. This is because we are only given one CIP code and it does not accurately reflect all of the job opportunities for our students. The current industry need for mechanics is much higher than reported in the ARPD data. We will continue to track the employment of our students after graduation to verify this demand and to show that it is most likely that the demand indicator is not “cautionary” due to the program being assigned only one CIP code, but in fact is “healthy.” However, because we only graduate students every other year due to being a two-year cohort-based program, every other year we will not be considered healthy, even if the CIP code were changed.

**Possible CIP CODES for DIMC**

49-3031.00	<a href="#">Bus and Truck Mechanics and Diesel Engine Specialists</a>
49-041.00	<a href="#">Farm Equipment Mechanics and Service Technicians</a>

53-3032.00	<a href="#">Heavy and Tractor-Trailer Truck Drivers</a>
493042.00	<a href="#">Mobile Heavy Equipment Mechanics, Except Engines</a>
49-9098.00	<a href="#">Helpers--Installation, Maintenance, and Repair Workers</a>
49-9041.00	<a href="#">Industrial Machinery Mechanics</a>

EFFICIENCY INDICATORS

Our efficiency indicators for DIMC over the last three years have been “healthy” and the program has had nearly a 100% fill rate for all three years. The majors to FTE BOR Appointed Faculty rate is 25 to 1. In AY 17-18, the fill rate was 96.6%, but we had 20 students even though our normal capacity is 19. Another way to see that we are healthy is that we have a mandated enrollment capacity and if the capacity is 75% or better, we are healthy as well. We forecast that the enrollment will continue to be high and our fill rate will stay well above 75%. Because we are a “capacity capped” program, the second method on the ARPD scoring rubric is used to determine the program’s health score. If the \*Majors to FTE BOR Appointed Faculty is 15-35, the program is healthy. The DIMC program FTE BOR Appointed Faculty has been in this range all three years.

EFFECTIVENESS INDICATOR

The effectiveness indicators for DIMC for the last three years have been “healthy.” The data shows that the program has zero withdraws and 100% completion of “C” or better in the program’s courses for all three years and has consistently had a “Persistence Fall to Spring” rate of around 88%.

The instructor has tracked the students work load and courses that students take from the first semester they began the program in order to ensure that there was no confusion as to graduation requirements, and now with the permanent hire of an APT, the instructor has assistance in tracking students after graduation,

and assistance with helping students with graduation requirements. We will continue to track our graduates work placement and current employment as well as their continuing education and/or other endeavors.

#### OVERALL HEALTH OF THE PROGRAM

The overall health of the program based on the Program Quantitative Indicators has been “cautionary,” “cautionary,” and “healthy.” Of the three indicators, only the demand indicator was deemed Unhealthy. The Efficiency indicator was given a Healthy call and the Effectiveness indicator was given a Healthy call. As explained above, we have determined that the Demand Health Call indicator calculations are inaccurate. The numerator in the formula, New & Replacement Positions (County Prorated), is too low to account for all the available jobs. We know for a fact there were more than eight or nine job openings for our students. We have been collecting data and tracking our graduates’ work placement and current employment. Please see the attached data sheet of the graduates and their work places/locations. As we stated in our last Program Comprehensive 3-Year Review AY 13 to AY15 and in all our recent APRS, we are committed to tracking our graduates’ work placement and current employment to show data that there are more employment opportunities in the county overall than the ARPD data shows. Counting all available jobs would give us a truer number and a better Health Call.

#### **Describe, discuss, and provide context for the program’s data in the Distance Education, Perkins Core Indicators, and Performance Funding Indicators categories, as applicable.**

The Perkins Core Indicator 1P1 Technical Skills Attainment was not met with a 00.00 score for the years that we did not have graduates, and met with a score of 100.00 for the year that we had graduates. This indicator does not take into account that we had no graduates in Fall 2014 or Spring 2015 or fall 2016 and Spring 2017. The actual degrees awarded in 2016 were 20, and we had 20 students physically in class. This means that our score for Spring 2016, for the purposes of this report is actually 100%.

The Perkins Core Indicator 2P1 Completion was not met the first year, then met, and then not met. As stated above, this data shows that we do not meet for the years when we have no graduating classes. Every other year data will show that we do not meet 1P1 because every other year the students will be half way through their required courses.

For the Perkins Core indicator 3P1 Student Retention or Transfer, the program met the goals when there were graduates and did not meet if the program was in the middle of the two-years of instruction when there are not graduates. The past three years, the program had students that were very motivated and enthusiastic about the opportunities that lay ahead of them. The retention rate reflects their motivation in that they continued with their education. In the past, economic hardships and personal challenges were factors for not finishing the program, but this was not the case in the last three years.

In looking at the Perkins Core indicator 4P1 Student Placement, the scores show that the program does not meet because of one CIP code, but as stated earlier, the instructor and APT track graduates' employment and our attached evidence shows that this indicator is in fact being met and has been met the last three years.

The Perkins Core indicator 5P1 Nontraditional Participation and the Perkins Core indicator 5P2 Nontraditional Completion were not met in the last three years, these indicators have always been a challenge. We are currently emphasizing recruitment of non-traditional students in our program by going to job fairs and talking to non-traditional students. We hired a female APT staff member in Fall 2015 and she has been and remains very active in encouraging prospective non-traditional students to visit our booth/display, to ask questions or to examine the diesel engines on the various outings that we do to promote our program.

**What else is relevant to understanding the program's data? Describe any trends, internal/external factors, strengths and/or challenge that can help the reader understand the program's data for the three years under review that are not discussed above.**

#### ENROLLMENT/ EMPLOYMENT

There is a waitlist to get into the program even when program is taking in new students, which is every two years. There is significant growth on the Big Island creating a need for industrial mechanics. The DIMC program class size has continued to be at full capacity rate. The diesel mechanics field continues to grow and students are showing more interest in this trade as there is a need for skilled mechanics, and although the Diesel Program graduates are entry-level, there is more opportunity than in the recent past for apprenticeship positions in industrial work places such as the Macadamia Nut Factory, HELCO, Bacon Universal, and Hawthorne Caterpillar. There is also a need for CDL drivers on the Big Island. The awarding of the driving simulator through the Perkins Grant in AY 16-17 has allowed students' to understand the mechanics of a truck at a different level by driving the truck, and seeing, hearing, and feeling the mechanics in motion. . The need for CDL drivers on the Big Island and elsewhere is ongoing. The instructor will continue to track the student's work places and current employment so that we have an accurate account of some of the program's data that is negatively affected such as the Demand Indicator, and the Perkins Core Indicator 4P1.

In the last couple of years, there has been evidence of a need for more skilled mechanics than in the past. Mechanics who are retiring need to be replaced and this need has been voiced by industry. With technology constantly advancing, and industry growing, employers are looking for mechanics that are enthusiastic and willing to learn more about the latest technologies. There is discussion of creating more training and apprenticeship opportunities for graduates and students and acknowledgement that it is worth paying higher wages for these more skilled mechanics. The instructor has been meeting regularly with industry and the Advisory Council to discuss different ways to create more training opportunities to meet industry demands.

Technology is continuing to change and the instructor continues to meet with industry to discuss these changes. It is the instructor's goal to acquire up to date and green equipment technologies so that we

maintain a reputation for graduating capable students. The equipment in the shop is not completely up to industry standards, which is the consensus of the Advisory Council. It is also the consensus of the Advisory Council that we should research green technologies and incorporate them into our curriculum. We are always investigating ways in which we can re-use parts and create green equipment and/or be creative in acquiring equipment that is green. The volunteer lecturer for DIMC 55 in Spring 2017 (who was a paid lecturer in Spring 2016) and the instructor were able, with assistance from the students, to fabricate a stainless steel barrel for oil recycling. A stand was made from scrap metal that the students sanded, painted, and with minimal monies, attached hoses and valves. The barrel was polished and a pump and filter added so that the oil can be re-used, saving the program money on oil and teaching green technologies. The program is currently looking to continue to take on these types of creative projects to show the importance of green technologies as well as demonstrate the advantages of being resourceful. It is our goal to produce graduates who are familiar with and embrace these new technologies that have an impact on the island that we live on as well as producing graduates with the knowledge that this industry is constantly changing.

The program continues to assist the Model Homes Project and has been doing repairs on various machinery used for the project such as the tractor, backhoe, and the excavator. The Model Homes Project currently uses an older excavator and the upkeep, that is continuous, serves as a great learning tool for our students. We look forward to continually assisting the Model Homes Project.

## **Program Activities**

**Report and discuss all major actions and activities that occurred in the program during the 3-year review period, including the program's meaningful accomplishments and successes.**

**Also discuss the challenges or obstacles the program faced in supporting student success and explain what the program has done to address those challenges.**

**For example, discuss:**

- **Changes to the program's curriculum due to course additions, deletions, modifications (CRC, Fast Track, GE-designations), and re-sequencing;**
- **New certificates/degrees;**
- **Personnel and/or position additions and/or losses;**
- **Other changes to the program's operations or services to students**

PERSONNEL:

A lecturer was hired to teach a few of the modules in DIMC 55 Hydraulic and Hydrostatic Systems.

A permanent APT was hired in the summer of 2016.

PROFESSIONAL DEVELOPMENT:

The Diesel Mechanics Instructor attended the Northwest Diesel Instructor Conference at Portland Community College April 21-22, 2016. This conference is a two-day training that gives instructors a chance to gain insight into the future of the technologies we teach and share experiences with other educators.

MATH QM120T REQUIREMENT:

The program has received positive feedback from students about the QM120T Math course that is now being taught in the portable adjacent to the AMT building, which is very close and convenient for the students in parking and in time management.

LAULIMA WEBSITE:

The instructor is happy with the use of the Laulima website and the ease of showing the power points as well as student access. The students now have 24/7 access to the materials that they need for class/exams. The program will continue to investigate software and programs and work on updating materials continually so that it is easily accessible and available to students.

EQUIPMENT:

- The program has received the new Snap-On sand blaster and it is used often by students when cleaning parts and allows for more time wrenching and less time cleaning parts.
- The program was in need of replacing and/or fixing broken equipment such as the 75-ton Arbor Press which was replaced in Spring 2018.
- The instructor was able to refurbish a donated aluminum fuel container with the help of the students and the part-time lecturer to make an oil reclaimer.
- The purchase of a driving simulator was approved by the Perkins Grant funding AY 15-16.
- In Spring 2018 the program has received the new Sting Ray Parts Washer and is in the process of installing the parts washer.
- In Spring 2018, the program received a donated 3456 Caterpillar Gen Set engine from Hawthorne Pacific Corp. and is optimistic in negotiating donations for the additional parts needed to make the 3456 engine a running dynamometer with additional electronics being bought if the Perkins Grant that will be written in Spring 2019 is approved
- The purchase of a driving simulator which was approved by the Perkins Grant funding has been integrated into the curriculum for DIMC 140, CLO 4, "Demonstrate an apprenticeship level ability in operating specialized power-train equipment," and to DIMC 150, CLO 4, "Demonstrate an apprenticeship level ability in operating specialized H-D brakes, steering and suspension equipment as well as hydraulic and hydrostatic equipment." Both of these CLOs are linked to PLO 4.
- The program received the 6 mobile column lifts because of budget requests in the last Comprehensive review. These lifts allow for easier access to the under parts of large vehicles and machinery, and make for a better, safer work environment.
- Donated 20' trailer from Hawaii Petroleum.

#### CURRICULUM CHANGES:

In Spring 2017, the following changes were submitted to the Curriculum Review Committee:

1. The program added two courses and deleted four courses so that DIMC 30 and 33 were combine and are now DIMC 130, and DIMC 50 and 55 were combined and are now DIMC 150.
2. The courses DIMC 20 and DIMC 40 have been re-named to DIMC 140 and 150.
3. The CLO's for DIMC 120, 130, 140 and 150 were re-written and re-sequenced.
4. The new CLOs were aligned to the PLOs.
5. The PLOs were aligned to the new ILOs.

Fall 2017, curriculum changes were approved, blocking 30/33, 50/55, renumbering the courses, re-numbering and re-ordering and re-writing the CLOs, re-aligning the CLO's to PLOs and re-aligning the PLOs

to the new ILOs. The program began teaching the revised curriculum in Fall 2018 with a new cohort that started with the new DIMC 120, 130, 140, and 150 courses.

ASSESSMENTS/ ASSESSMENT CHANGES:

- Fall 2015 assessments: Initial for DIMC 40
- Spring 2016 assessments: Initial for DIMC 50 & DIMC 55
- Fall 2017 assessments: Closed the Loop for DIMC 40
- Spring 2018 assessments: Closed the Loop for DIMC 50 & DIMC 55

In AY 17-18 the program re-worded the CLOs and re-aligned the CLOs, PLOs and ILOs, making the assessment results easier to understand and the learning outcomes of the more comprehensive assessments more clearly defined, leaving less room for any possible confusion in student expectations. This also helps us to see where there is room for improvement and where the program meets the program learning outcomes.

JOB FAIRS AND CAREER DAYS:

The instructor, with the help of the APT, has recently visited high schools and gone to career and job fairs and more recently, visited elementary schools as well. HAAS Elementary Charter School was the first elementary school that was contacted. The APT for the diesel program went to the HAAS and visited two classrooms to talk about the diesel and welding programs at HCC in AY 16-17 and also went to Keonepoko Elementary School in the AY 17-18. The program plans to do more outreach to elementary schools in the next year to discuss possible career day dates. We hope to visit low income and under-represented groups in Pahoā, Kea‘au and North Hilo.

OTHER:

The Diesel Program attended HCC day AY 15-16, AY 16-17 & AY 17-18 with the display of a running diesel engine and brochures.

The program has close professional relationships with persons working in the industry such as Hawthorne Caterpillar and Conan’s that are available to come and talk to the students about their trade and the expectations they have of our graduates if hired. These professionals are always invited to the end of the

semester and the Christmas parties, where the program can keep in communication if they haven't visited recently.

The instructor coordinated times with counselors to schedule scholarship and resume workshops.

**BUDGET:**

The operating budget has not increased since the original formula was developed and implemented in the late 1990's. All of our resource costs have increased with inflation over the years but we still have to manage with the same budget.

It is safe to say that a typical diesel part from the 1990s has increased in price at least 50% when compared to today's prices. The program is always creatively looking for ways to acquire monies such as donations.

We are also mindful of what we do not use and try to refurbish and recycle parts as often as possible.

## **LEARNING-OUTCOMES ASSESSMENTS**

For assessment resources, please see the [HawCC ASSESSMENT](#) website. Submitted course assessment reports can be accessed on the Campus Labs OUTCOMES system via the [Campus Labs Resources page](#) and the [HawCC Course Reports ARCHIVE](#) .



The program faculty/staff have reviewed the program record on Kualii KSCM and hereby affirm that all information, including all program learning outcomes (PLOs), are correct.



The program faculty/staff have reviewed the program record on Kualii KSCM and have found that all or some information is incorrect and hereby affirm that the program will submit proposal(s) for revision(s), as appropriate.

Kualii KSCM: <https://hawaii.kualii.co/cm/#/courses>

*If the program's information on Kualii KSCM needs revision (for example, program description, entry or completion requirements, PLOs), program faculty may propose revision through the Curriculum Review Committee or Fast Track processes, as appropriate. Both types of revision proposals may be submitted via Kualii.*

## Program Learning Outcomes (PLOs)

List the Program Learning Outcomes (PLOs) as recorded on Quali KSCM and indicate each PLO's alignment to one or more of the Institutional Learning Outcomes (ILOs). The College's ILOs may be found on the [HawCC ASSESSMENT](#) website.

PLO#	Program Learning Outcomes (text)	Aligned to ILO #
1	Function safely in a heavy equipment shop environment.	1, 2 & 5
2	Demonstrate ability to communicate effectively to gather and convey information.	1, 2, 3 & 4
3	Apply theory and principles for proper diagnosis, repair, and maintenance in the heavy-duty truck equipment industry.	1 & 2
4	Practice the minimum essential mental, physical, and behavioral skills necessary to maintain professional proficiency.	1, 2, 3, 5 & 6
5	Work collaboratively with others as well as independently.	1, 3, 4 & 5

**Discuss the program's successes and challenges in helping program majors achieve its overall Program Learning Outcomes (PLOs). Include a summary discussion of the results of any PLO assessments voluntarily undertaken by the program's faculty.**

In general, over the last three years, the PLO benchmarks have been met with scores from 74% to 93%. PLOs 2 & 3 had the lowest scores of 74%, not meeting the benchmark. These CLOs focused on the students' ability to communicate effectively and to gather and convey information and the ability to diagnose and apply principles and theories learned in the classroom to live repairs in the shop. Essentially, this cohort had difficulties reading manuals and looking for technical information and also in soft-skill areas of communication

and attributes which make a good employee. This cohort differed from the previous cohort that did very well in these soft-skills areas but had challenges with the note taking and classroom activities and lecture. Because of the noted differences, which had a lot to do with outside influences such as the ability to find child care, transportation or employment, the instructor was able to change teaching techniques to support the challenging areas, as will be discussed later in this report under “Action Item #1.” PLO analyzation was helpful in seeing where challenges lie and also seeing that, overall, the program has been meeting the majority of the benchmarks throughout the last three years.

The graphs below from Campus Labs illustrate our students’ achievement of the PLOs in the past two years. The color bar shows that the large majority of our students are meeting or exceeding the PLOs, shown in green. (AY15-16 results were reported prior to the College acquiring the Campus Labs system.)

# PLO RESULTS AY16-17 on CAMPUS LABS

## Diesel Mechanics

Academic Year 2016-17

Outcomes Taxonomy Curriculum Map

Term: Overview [Add Outcome](#)

DISL_PLO1	<b>DISL PLO1</b>	
DISL_PLO2	<b>DISL PLO2</b>	
DISL_PLO3	<b>DISL PLO3</b>	
DISL_PLO4	<b>DISL PLO4</b>	
DISL_PLO5	<b>DISL PLO5</b>	

DISL PLO1: Function safely in a heavy equipment shop environment.

DISL PLO2: Demonstrate ability to communicate effectively to gather and convey information.

DISL PLO3: Apply theory and principles for proper diagnosis, repair, and maintenance in the heavy-duty truck equipment industry.

DISL PLO4: Practice the minimum essential mental, physical, and behavioral skills necessary to maintain professional proficiency.

DISL PLO5: Work collaboratively with others as well as independently.

# PLO RESULTS AY17-18 on CAMPUS LABS

## Diesel Mechanics

📅 Academic Year 2017-18

📄 Outcomes   📁 Taxonomy   🗺 Curriculum Map

Term:  [Add Outcome](#) ▾

<p>DISL_PLO1</p> <p><b><u>DISL_PLO1</u></b></p> <p>DISL PLO1: Function safely in a heavy equipment shop environment.</p>	
<p>DISL_PLO2</p> <p><b><u>DISL_PLO2</u></b></p> <p>DISL PLO2: Demonstrate ability to communicate effectively to gather and convey information.</p>	
<p>DISL_PLO3</p> <p><b><u>DISL_PLO3</u></b></p> <p>DISL PLO3: Apply theory and principles for proper diagnosis, repair, and maintenance in the heavy-duty truck equipment industry.</p>	
<p>DISL_PLO4</p> <p><b><u>DISL_PLO4</u></b></p> <p>DISL PLO4: Practice the minimum essential mental, physical, and behavioral skills necessary to maintain professional proficiency.</p>	
<p>DISL_PLO5</p> <p><b><u>DISL_PLO5</u></b></p> <p>DISL PLO5: Work collaboratively with others as well as independently.</p>	

## COURSES ASSESSED

List all program courses (alpha/#/title) that were assessed during the 3-year review period.

### AY 17-18

<b>“Closing the Loop” Assessed Course Alpha, No., &amp; Title</b>	<b>Semester assessed</b>	<b>CLOs assessed (CLO#s)</b>	<b>PLO alignment (PLO#s)</b>
<b><u>DIMC 40</u></b> Introduction to Power Trains	Fall 2017	CLO: 1 CLO: 2 CLO: 3	PLO: 3 PLO: 1,4 PLO: 5
<b><u>DIMC 50</u></b> Heavy Duty Brakes, Steering, Suspension	SP 2018	CLO: 1 CLO: 2 CLO: 3 CLO: 4 CLO: 5	PLO: 1 PLO: 2 PLO: 3 PLO: 4 PLO: 5
<b><u>DIMC 55</u></b> Hydraulic and Hydrostatic Systems	SP 2018	CLO: 1 CLO: 2 CLO: 3	PLO: 2,5 PLO: 3 PLO: 1,4

### AY 16-17

<b>“Closing the Loop” Assessed Course Alpha, No., &amp; Title</b>	<b>Semester assessed</b>	<b>CLOs assessed (CLO#s)</b>	<b>PLO alignment (PLO#s)</b>
DIMC 20 Introduction to Diesel Engines	Fall 2016	CLO: 1 CLO: 2 CLO: 3 CLO: 4	PLOs: 1,2,3,4,5 PLO: 2 PLOs: 1,2,3,4,5 PLOs: 1,2,4,5
DIMC 30 Introduction to Electrical Systems	Spring 2017	CLO: 1 CLO: 2 CLO: 3 CLO: 4	PLO: 1 PLO: 3 PLO: 2 PLO: 3

		CLO: 5	PLO: 5
DIMC 33 Introduction to Fuel Systems	Spring 2017	CLO: 1 CLO: 2 CLO: 3 CLO: 4	PLOs: 2,4 PLO: 3 PLO: 1 PLO: 5

**AY 15-16**

<b>Assessed Course Alpha, No., &amp; Title</b>	<b>Semester assessed</b>	<b>CLOs assessed (CLO#s)</b>	<b>PLO alignment (PLO#s)</b>
DIMC 40 Introduction to Power Trains	Fall 2015	CLOs: 1,2	CLO:1 aligned to PLOs:1,3 CLO:2 aligned to PLOs: 1,4
DIMC 50 Heavy-Duty Brakes, Steering and Suspension	Spring 2016	CLOs: 1, 2, 3, 4.	CLO:1 aligned to PLO:1, CLO:2 aligned to PLO: 2, CLO: 3 aligned to PLO: 3, CLO: 4 aligned to PLO: 4
DIMC 55 Hydraulic and Hydrostatic Systems	Spring 2016	CLOs: 1, 2, 3	CLO: 1 aligned to PLOs: 2,5 CLO:2 aligned to PLO:3 CLO:3 aligned to PLOs: 1,4

**Course Learning Outcomes (CLOs) Assessed:**

For every one of the assessments above, every CLO was assessed for that course. The CLOs are no longer on Quali, because they have all been re-written and re-sequenced, and re-aligned. There are hard-copies of the assessments in the instructor's office and the College's assessment website.

**Discuss and summarize the overall results of course assessments conducted during the 3-year review period, focusing on students' achievement of Course Learning Outcomes (CLOs).**

**Describe how the program's faculty/staff used course assessment results to plan for and implement improvements in student learning, and analyze the effects on students' learning of implementing those improvements.**

In the last three years, the results of every assessment were satisfactory, and in some cases, the results were better than expected. The only exception was the Final Exam for DIMC 40 in Fall 2017, only 11 out of 19 students, or 58% met the goal of 75%, and the Soft Skills Assessment in Spring 2018, 13 out of 19 students, or 63%, met the goal. This cohort had an unusual amount of outside influences that did not support students' success and which has been discussed in the annual reviews previously. Some of these influences include incarceration, hospitalization, unemployment, and loss of child care, all factors that hindered assessment scores and ultimately the students' productivity. Even though the students did not do as well as they may have under different circumstances, the instructor is gratified with the results of the assessments over the last three years. Not one student withdrew from the program and the instructor is proud of the students and their ability to communicate with the instructor in order to brainstorm solutions and ultimately graduate.

The two assessments over the last three years with the highest results were the assessments for performance and soft skills from the cohort before the above mentioned cohort. This cohort was exceptional, had outside family support, and in those two assessment areas, every student scored 100%.

Assessments will continue to show where students face challenges and where they succeed, the program will continue to monitor the results in order to understand where students have difficulty, and teaching methods will be modified depending on the students and the particular cohort if needed. In this review, under "Action

Plan,” the “Hands-On” teaching strategy is discussed, and has been decided based on the above assessments. The instructor has been implementing these new teaching strategies as early as Fall 2018.

## PART II: 3-YEAR ACTION PLAN & RESOURCE ALLOCATIONS

### Resource Gap Analysis

Describe the program’s current resources and resource needs in each category below.

Resource Category	Resources the program needs to operate effectively:	Resources the program already has:	What is the program’s resource gap?
A. Personnel	N/A		
1) Positions (Functions)	N/A		
2) Professional Development	Attend Northwest Diesel Instructor Conference. This conference is a two day training that gives instructors a chance to discuss teaching strategies, gain insight into the future of the technologies we teach and share experiences with other educators. The Diesel Mechanics Program is constantly upgrading equipment and exploring ways in which students learn but this type of conference allows for perspective because of the networking available in such a short amount of time.	Currently, the instructor communicates with local industry and a few instructors on the mainland over the phone, otherwise, this type of resource does not exist.	Attend Northwest Diesel Instructor Conference, approx. cost \$2,500.00

<b>B. Operating Resources</b>			
<b>1) Supplies</b>	Need is \$12,000 per year. Current operating resources are at an amount that was determined 20 years ago. All parts, tools, equipment and other resource prices have increased significantly over the past 20 years, and program has to ship 90% of resources from Oahu or the mainland.	\$6,000.00	\$6,000.00
<b>2) Contracts</b>			
<b>3) Equipment</b>	<p>1. 2014-2017 Caterpillar, D6 Track-type tractor</p> <p>2. Skid skidsteer, 236D Cat or equivalent with buck and thumb attachment.</p> <p>3. Excavator, 308 Cat or equivalent.</p>	<p>1. The program does not have earth moving equipment with this capacity.</p> <p>2. The program does not have a skid steer. Or anything that is equivalent.</p> <p>3. The program does not have any Caterpillar equipment</p>	<p>1. 2014-2017 Caterpillar, D6 Track-type tractor, approx. cost \$225,000 <i>used</i>, (\$426,736 <i>new</i>)</p> <p>2. Skid steer, 236D Cat or equivalent with buck and thumb attachment, approx. cost \$30,000 <i>used</i>, (\$47,603.00 <i>new</i>)</p> <p>3. . Excavator, 308 Cat or equivalent approx. cost \$ 85,000 <i>used</i>,</p>

	<p>4. Kenworth diesel truck, T-800 B year 2000 or newer.</p> <p>With C15 engine, 485 Horse power minimum, 18 speed transmission, 411 gear ratio Eaton Fuller transmission (no Rockwell no Spicer- Allison is automatic), No DPF, Single or double axel as long as suffices for type A license</p> <p>5. Complete 120-piece puller set or equivalent</p> <p>6. ISX engine</p>	<p>equivalent to the 308 CAT</p> <p>4. The program has a 1998 T 800 B Kenworth truck currently but the engine is a Cummins N14 and different transmission and gear ratio.</p> <p>5. The puller set that the program has is incomplete and missing parts and from the 1980s.</p> <p>6. There are no ISX engines owned by the program</p>	<p>(\$142,000 <i>new</i>)</p> <p>4. Kenworth diesel truck, T-800 B year 2000 or newer. Approx. cost \$135,000.00 (<i>used</i>)</p> <p>5. Complete 120-piece puller set or equivalent approx. cost \$3,920.00 (<i>new</i>)</p> <p>6. ISX Engine approx. cost \$25,000 (<i>refurbished</i>)</p>
<b>3) Space and Facilities</b>			
<b>C. Technology</b>			
<b>1) Hardware</b>	Taylor dynamometer or equivalent to Taylor.	The torque on the dynamometer that we have is damaged and	Taylor dynamometer or equivalent to Taylor. Approx. cost \$90,000

		cannot communicate with the software, the dynamometer is outdated, and the repairs are equivalent to a new dynamometer.	<i>new (cannot be purchased used)</i>
2) Apps or Software			
3) Tech Support			
4) Tech-related PD			
5) Tech labs / facilities	Electrical training troubleshooting and diagnostic training boards for students.	There are no electrical training boards.	Electrical training boards, approx. cost \$5,000

## Action Plan

*Where are you going? How are you going to get there?*

**Provide a brief narrative of your overall Action Plan for the next 3 years. Focus on how this Action Plan will help improve student success. Describe how this Action Plan can help the College achieve our Initiatives in the *Strategic Directions 2015-2021* plan. <http://hawaii.hawaii.edu/sites/default/files/docs/strategic-plan/hawcc-strategic-directions-2015-2021.pdf>**

The Diesel Mechanics Program has developed a comprehensive integrated action plan for the next three-year review period. This plan has four major components.

1. Our first component is working to increase and stabilize enrollment of highly interested students
2. Our second component is classroom and workshop focused. The instructor will work to enhance student focused instructional strategies.

3. Our third component involves increasing rigor in instructional strategies for students through enhanced availability of training equipment and updated industry-specific tools, materials, software and other workshop requirements.

4. Our final strategy is to develop apprenticeships in industry for continuing students and graduates.

Below we provide additional details of each these four areas of improvement.

1. High School Students to shadow diesel students

The instructor is in contact with Waiakea High school to set-up a “shadowing program” for high school students. This aligns to:

HGI Action Strategy 1: “Strengthen the pipeline from K–12 to the university to improve college readiness and increase college attendance.” and  
“Engage Hawai’i Island K–12 students, parents, and public and private schools early and often to promote and prepare for college readiness.”

AND

“Emphasize pipeline and college readiness initiatives for Native Hawaiians, rural communities, and low-income and under-represented groups.”

2. Changes in teaching methodology and enhanced use of instructional aids

2.1 During each instructional session, each day, the instructor will introduce the diagnostic equipment and some of the tools first and before the classroom session takes place. Students will participate in the hands-on demonstrations with the instructor and then return to the classroom for note-taking and lecture. This “hands-on learning first” approach will be fully implemented in the AY 18-19. This aligns to:

HGI Action Strategy 2: “Implement structural improvements that promote persistence to attain a degree and timely completion.” and  
“Strengthen and align assessment, program/unit review, data collection, and data analyses processes to support improved teaching and learning, accreditation, and governance and planning.”

2.2 CDL Driving simulator will be incorporated into curriculum

The instructor will also make a schedule so that with the help of the APT, students will be able to practice driving with the CDL driving simulator, which the program currently owns. This aligns to:

HGI Action Strategy 3: “Anticipate and align curricula with community and workforce needs.”  
and  
“Follow up with graduates and employers regarding Hawai’i CC students’ preparation for the workforce and community.”

### 2.3 Electrical Training Boards

The instructor will purchase electrical training boards that have a variety circuits chosen from the three main types of circuitry. Students will be able to create and modify the boards to their liking and physically demonstrate their knowledge by showing how the electricity turns on the light, or horn, or whichever component is being used to show the completion of the circuit. This aligns to:

HI2 Action Strategy 3: “Continue to support programs that suit Hawai’i Island’s location and environment as well as address critical gaps.” and  
“Work closely with employers to increase the qualified and skilled workforce base.”

### 2.4 Professional Development for Instructor

The instructor will attend the Northwest Diesel Instructors Conference. This conference will assist the instructor by being exposed to different teaching styles, techniques, and current and upcoming technologies, as well as allow for networking with other diesel mechanics, instructors and industry on the mainland. This aligns to:

HGI Action Strategy 2: “Implement structural improvements that promote persistence to attain a degree and timely completion.” and

“Provide enhanced professional development to improve teaching and learning.”

AND

HPMS Action Strategy 1: “Employ best practices in management, administration, and operations.”

and

“Continue participation in professional and leadership development for Hawai’i CC faculty and staff.”

### 2.5 Increase Operating Resources

By increasing the daily operating resources of the diesel shop, the instructor will be able to operate more smoothly. Currently there is a lack of funding to buy the office supplies, PPE such as gloves and ear plugs, tape, adhesives, and computer software updates (such as Java) so that the instructor has to limit use, pay

out of pocket, or go without these type of budget items. For instance, because Java has a monthly due, certain documents cannot be edited or opened and are sent to other departments, where they are edited or re-formatted and sent back as a favor to the instructor. The software on the current computers is outdated and soon will have to be updated to keep up with the technology used in the program.

3. Procure and implement into the programs curriculum training equipment and updated industry-specific tools, materials, software, and other workshop requirements.

By updating and obtaining the following equipment, the program will benefit student learning. All of these purchases will support and align to:

HI2 Action Strategy 2: “Advance innovation and entrepreneurship within UH and the community.”  
and

“Strengthen existing partnerships and form new ones to enhance high quality job creation on Hawai’i Island by enhancing meaningful collaborations with state agencies, incubators and accelerators national and international agencies, and collaborators.”

AND

HGI Action Strategy 3: “Anticipate and align curricula with community and workforce needs.”  
and

“Follow up with graduates and employers regarding Hawai’i CC students’ preparation for the workforce and community.”

AND

HI2 Action Strategy 3: “Continue to support programs that suit Hawai’i Island’s location and environment as well as address critical gaps.” and

“Work closely with employers to increase the qualified and skilled workforce base.”

Our equipment requests related to this goal #3 include the following:

3.1 D6 track-type tractor is a type of heavy equipment that the program does not have own. Owning this piece of equipment would allow the students to have a live training aid that would also be used to support the AG Program for their new fam land, and the one they currently farm, and to support the Carpentry Program by assisting with the Model Home Project.

3.2 Cat Skidsteer would give the students a training aid that would also be useful, as the D6 would be, but would give the students more training on various hydraulics, which is the number one repair problem in the industry.

3.3 Excavator 308 Cat or equivalent would allow students to train on the various pumps and attachments that the skidsteer does not have, as well as hydraulics.

3.4 A Kenworth Truck T800 B would give the students the opportunity to work on large vehicles that they would find in the industry if working in a diesel truck repair shop.

3.5 120 Piece Puller Set is necessary for repairs on the large trucks and heavy equipment for brakes, axles, bearings, hydraulics and other breakdowns and maintenance type replacements.

3.6 Procurement of an ISX Engine would allow students to train on the type of engine that is currently the most common engine on the road. The program does not own an ISX electronic engine, and students are learning from the text, not hands-on.

3.7 A Dynamometer is necessary to demonstrate the gear ratios, torque, and RPM of diesel engines without having to actually drive a truck with 20 students aboard. This training device is common in all diesel mechanic programs across the United States and would be very rare if a program did not own one. Ours is currently outdated, from the 1990s and in need of repairs that would cost close to the price of purchasing a new dynamometer.

3.8 Software from Cummins Quickserve will introduce to students to what they would use in the industry. This software is specific to Cummins, which is the most common engine we work on, except for Caterpillar, which we already use in class and lab when troubleshooting.

4. The program will develop apprenticeships in local on-island industry for continuing students and graduates. This aligns to:

HGI Action Strategy 3: “Anticipate and align curricula with community and workforce needs.”

and

“Follow up with graduates and employers regarding Hawai’i CC students’ preparation for the workforce and community.”

AND

HI2 Action Strategy 3: “Continue to support programs that suit Hawai’i Island’s location and environment as well as address critical gaps.”

and

“Work closely with employers to increase the qualified and skilled workforce base.”

AND

HI2 Action Strategy 2: “Advance innovation and entrepreneurship within UH and the community.”

and

“Strengthen existing partnerships and form new ones to enhance high quality job creation on Hawai’i Island by enhancing meaningful collaborations with state agencies, incubators and accelerators national and international agencies, and collaborators.”

## Action Items

**Provide details below for each Action Item needed to accomplish this 3-Year Action Plan.**

**What specific strategies, tactics, initiatives, innovations and/or activities will the program implement to accomplish one or more of the goals described in the 3-year Action Plan above?**

Action Item 1: Increase enrollment of industry-interested students.

The Diesel Mechanic Program would like to work with Waiakea High School to develop enhanced opportunities for the high school students to learn about the diesel industry and what it takes to be successful as a diesel professional. We hope to start a student “shadowing” program in the Spring 2020 semester.

The high school students would be able to shadow our HawCC students during class time in order to show them what college is all about and introduce them to diesel mechanics earlier than they would normally be introduced to the college courses. Our current Diesel Mechanic students would benefit because, by showing other students what they are learning, it reinforces their own skills and allows them to practice their communication and interpersonal skills. The program faculty will explore if the high school students could possibly earn college credit toward graduating from HawCC.

Action Item 2: Enhance student focused instructional strategies

The instructor is enthusiastic about the restructuring of the lecture time. In the past, the lecture and note taking were done before the demonstration of the use of diagnostic equipment and tools. After multiple discussions with colleagues, diesel mechanics, the Advisory Council, and a retired diesel mechanic instructor from Palomar Junior College in Escondido, California, the instructor has decided that the introduction to the diagnostic equipment and some of the tools will be done first and before the classroom sessions and note-taking takes place. Students will participate in the hands-on demonstrations with the instructor and then return to the classroom for note taking and lecture.

The program instructor will also incorporate the use of the CDL training into the regular curriculum as well as the use of electrical training boards. The instructor will make a schedule so that with the help of the APT, students will be able to practice driving with the CDL driving simulator. In communicating with the Advisory Council, we have found that industry is lacking CDL drivers on the island, and not only does that affect the need for drivers, but it effects mechanics' ability to test drive vehicles after repairs have been done. Our advisory council has voiced the necessity of diesel mechanics with CDL licenses.

The Advisory Council has also asked for skilled mechanics with more electrical knowledge. The instructor plans to use these training devices as part of the hands-on learning approach discussed above so that the students have a secure understanding of the concepts and can also physically demonstrate the ability to trouble shoot and diagnose in the classroom.

In addition, this action item includes necessary professional development for our primary instructor for a conference on the mainland to stay abreast of technologies and network. The instructor will

continue to look into Perkins and research other financial resources in order to fund professional development.

Action Item 3: Increasing instructional rigor through enhanced availability of training equipment.

As explained above, in order to increase rigor to full industry standards, the program needs to update its training equipment, including purchasing various vehicles, tools and software to benefit student learning. For example:

- D6 track-type tractor: funding would support many programs and ultimately save the College money by not having to finance earth moving projects for other programs. The Diesel Mechanics Program is able to do the maintenance, especially if costs are shared with Ag and Carpentry Programs.
- A Skidsteer, 236D Cat with buck and thumb: funding is being researched, and the program has been contacting industry in hopes of grant-type funding.
- Excavator, 308 Cat or equivalent: funding is also being researched because of the difference this training tool would make in the program and for student learning.
- A Kenworth T800B tractor: this would greatly benefit the students by having an actual vehicle with moving parts to diagnose and repair. A grant was written in the past for the truck-tractor, but was not approved.
- The 120-piece puller set: this would replace the current puller set that is missing about 20% of its components and very worn out because the pieces are dated back to the 1980s or possibly earlier. This has been a consistent budget request and will continue to be. The instructor has successfully made many of the programs “pullers” with recycled materials, but these particular pullers are specific to the equipment and cannot be safely manufactured.
- ISX engine: by acquiring this engine, the instructor can teach students with training equipment that is up to date. The instructor has been looking for an ISX engine which has the most current electronics in the industry, and is widely used. The instructor will reach out to industry for assistance in purchasing an ISX engine, and possibly write a Perkins Grant in the AY 19-20, before the DIMC 120 - Introductions to Engines course is taught again in Spring 2020. . See budget request above: \$25,000 for a remanufactured engine

- Dynamometer: this is an essential component for teaching diesel mechanics and can be found in almost every shop. The instructor is currently working on a grant proposal and reaching out to industry for a Dynamometer for the program.
- Software: the program is meeting with Cummins in hopes of acquiring more training software that the students can utilize independently. The Hawthorne Caterpillar SIS software is extremely helpful for students when looking for schematics, parts, systems, and steps and procedures for repairs. It also helps the student learn navigational techniques for software for mechanics. The instructor hopes that the software will allow students to navigate training modules that coincide with the curriculum for added reinforcement of the learning outcomes.

Action Item 4: Develop Apprenticeships for students

The instructor is working with Hawthorne Caterpillar in hopes that there is the possibility of aligning curriculum and sending students to work at Hawthorne Caterpillar in their last semester of school. There is more research needed, curriculum needs to align with the curriculum of Hawthorne Caterpillar’s training modules, and more discussion is needed. The program hopes that if curriculum is aligned during the AY 19-20, then possible apprenticeships could start as early as Spring 2021.

**How will implementing this Action Item help lead to improvements in student learning and their attainment of the program’s learning outcomes (PLOs) over the next 3 years?**

Action Item 1:

The program recognizes that our student attrition rate in early semesters is because some students may not understand the physical, mental and soft-skill requirements of becoming a diesel professional. Our proposed shadowing program will allow interested high school students to better determine if this is the appropriate program for them. Increasing our enrollment of highly interested students who are well prepared to enter this program will allow us to focus on enhancing student learning for this targeted group.

Action Item 2:

2.1 This “hands-on learning first” approach will be implemented in AY 18-19. In the beginning of the Fall 2018 semester, the instructor will take out multi-meters, electrical testing equipment, voltage

drop testers, amp readers, and electrical training boards. Demonstrations and lab tasks will be done before lectures on electrical theory. The instructor feels that by switching this around, the students will have a more concrete understanding of the curriculum before learning the theory behind it and plans to integrate this for every course. Another example would be taking students to Hawthorne Caterpillar in the first couple of weeks of the first semester at the start of the new cohort. Allowing students to see, feel, hear, and experience an actual operating local diesel mechanic shop will give them a better idea of the mechanic work that will be expected of them in industry from day one. In the past, students were taken to the Hawthorne Caterpillar mechanic shop the second or third semesters. The instructor has decided that most of the students in the program are hands-on learners and prefer tangible to theory. In teaching the hands-on lessons first, the instructor feels the students will be more motivated to learn the classroom lessons which involve lecture, note taking, and reading and studying the text books and manuals. Results of the integration of this approach will be discussed in the next Annual Review.

There are two course's CLOs, DIMC 140, CLO 4, "Demonstrate an apprenticeship level ability in operating specialized power-train equipment," and DIMC 150, CLO 4, "Demonstrate an apprenticeship level ability in operating specialized H-D brakes, steering and suspension equipment as well as hydraulic and hydrostatic equipment" that are linked to PLO 3. By taking students to train on the driving simulator, they will be able to link the learning outcomes of these CLOs to the hands-on experience of mechanical operations, helping them to understand how the equipment is operated and works mechanically when it is running.

2.2 CDL driving training on the simulator will allow students more practice driving time and support student learning outcomes, particularly by supporting PLO: 2, gathering the information needed to trouble shoot and PLO 3: applying principles for repair and proper diagnostics and maintenance.

Both of these learning outcomes are improved when a diesel mechanic is able to test drive a vehicle.

2.3 Electrical training boards will assist in accomplishing understanding of all PLO outcomes, safety, communication, gathering information, diagnosing and applying principles and mental and physical skills as well as working collaboratively with peers.

2.4 Instructor professional development will enable the instructor to better keep up with industry, which will help improve student learning and ultimately support all PLOs as well.

2.5 Operational budget, if increased, will allow instructor more time for teaching, professional development, networking, research and all other duties when not strategizing how to “make ends meet.”

Action Item 3:

Including current and updated equipment as used in the industry, for student training, the instructor will be able to show students what is actually being used in industry. Students may not become experts in this kind of innovative technology, but when they enter the work force, they will be familiar with it and be a step ahead when it comes to working on these types of innovative technologies and equipment. As a student, being exposed earlier on shows students how much industry has advanced and gives an idea of the ongoing technologies that they will need to keep learning when working as a diesel mechanic.

The program understands the very large equipment requests that we are making in this review may not be possible for the college to purchase for the program. However, each individual item on our requested equipment list is necessary for a top-notch diesel education. Our students will be able to achieve all of our program learning outcomes better, faster and easier if we can provide this kind of enhanced education.

Action Item 4:

Industry and the Advisory Council have made clear the need for mechanics with specialized training, and are hoping to align their curriculum with our curriculum so that our graduates have additional training available to them. There is also a need for basic fundamental skills that support Math and English skills that are not up to industry standards. If students were able work in the field to receive additional training, our students would graduate with more fine-tuned skills that allowed them to do service writing, and possibly work on specialized equipment, making them more of an asset to their employer.

Developing an apprenticeship program for current and graduating students is intended to fill this need. Students clearly will be able to achieve their PLOs better and easier if they obtain hands-on experience in the industry in addition to their college education. Because the ultimate goal is to see students succeed in the workforce as trained professional Diesel Mechanics, participating in apprenticeships in industry supports every one of the program’s PLOs. DISL PLO1: Function safely in

a heavy equipment shop environment. DISL PLO2: Demonstrate ability to communicate effectively to gather and convey information. DISL PLO3: Apply theory and principles for proper diagnosis, repair, and maintenance in the heavy-duty truck equipment industry. DISL PLO4: Practice the minimum essential mental, physical, and behavioral skills necessary to maintain professional proficiency. DISL PLO5: Work collaboratively with others as well as independently.

**Budget & Resource Asks: Describe in detail any additional or reallocated resources that will be needed to accomplish this Action Item. *If no additional or reallocated resources are required to accomplish this Action Item, enter "N/A" below.***

**Provide justification why this resource is necessary to accomplish this Action Item and the program's Action Plan.**

**Include the total cost and timeline for purchase or re-allocation.**

Action Item 1: no budget requests.

Action Item 2: budget requests only for item items 2.3, 2.4 and 2.5.

Item 2.3 Electrical training boards would allow students to diagnosis and see hands-on how the electrical circuits work in the trucks and equipment we use. Instead of gathering around the instructor in groups to work on an outdated single in series circuit that was wired together by the instructor with left-over parts and then waiting to practice one at a time, students could rotate boards and work in groups so that different circuits could be seen first-hand. The total cost for 20 boards would be \$5,000. The boards would ideally be purchased before the next DIMC 130 Introduction to Electrical and Fuel course in Fall 2020.

Item 2.4 Professional Development, \$2,500 approximate cost for the AY 19-20.

Item 2.5 budget increase of \$6,000 for AY 19-20.

Action Item 3:

The following equipment is requested:

- D6 track-type tractor- cost: \$225,000 used, Acquire by Fall 2021
- A Skidsteer, 236D Cat with buck and thumb- cost: \$30,00 used , Acquire Fall 2020
- Excavator, 308 Cat or equivalent-cost: \$85,000 used, Acquire Fall 2020
- A Kenworth T800B tractor- cost: \$135,000 used, Acquire Fall 2021
- The 120-piece puller set- cost: \$ 3,920 new, Acquire Fall 2019
- ISX engine- cost: \$25,000 for a remanufactured engine, ideally purchase before the DIMC 120 Introductions to Engines course- Fall 2019
- Dynamometer – cost: \$90,000, purchase Fall 2019
- Software Cummins – N/A-no charge, donation from Cummins, Acquire Spring 2019

Action Item 4: no budget requests.

Below the program also provides a graphic illustration of the budget requests listed above. Budget asks related to Action Item 2 are shown in green; budget asks related to Action Item 3 are shown in blue.

