

Construction Technology Program (CTEC)



ANNUAL REPORT OF PROGRAM DATA 2021



UNIVERSITY of HAWAII®
MAUI
COMMUNITY COLLEGE

1. Program or Unit Description

Program or Unit Mission or Purpose Statement

The Construction Technology (CTEC) Program prepares students in general building construction and maintenance of large or small structures. It allows students to explore different trades prior to selecting a specialization.

Value of degree

What is the industry/higher ed path value of the certificate versus degree level?

While many students come to the CTEC Program in pursuit of an AAS degree, a large portion seek certificates to support promotion in their existing career or to cross train within their organization. The CTEC Advisory Committee, consisting of local employers, confirms that degrees in the building and construction/ facilities engineering field may not be required for many entry level industry positions. However, they wholeheartedly recommend degrees for individuals that wish to advance to higher levels of employment in the building, construction and facilities maintenance and management industry.

Provide graduate highlights based on recent graduate placement data.

Due to the Covid-19 pandemic, recent placement data has been difficult to garner and interpret. Discussions with program students and local employers seem to maintain that our students continue to be employed at a high rate. Workforce demand in the building and construction trades has not been markedly reduced during this time and hospitality and tourism is projected to gain traction in the near future, all supporting excellent employment prospects for our students.

What is the target student or service population?

The program has multiple target populations. The first is the nontraditional older adult who is looking for a career change or upgrade. These students are at least 4 years past high school and are very diverse in educational backgrounds but are generally motivated to learn and have goals. The second target audience is recent High School graduates. The program spends considerable time going out to High Schools and through videoconference visits to promote awareness of building and construction and facilities maintenance and management as a potential career. A third group are professionals in the field who come for specialized training, for instance taking a carpentry, plumbing or electricity class, who are not degree seeking. We also have some Liberal Arts and other non-program majors who take one or two courses as electives.

CTEC program students compete for positions at entry or intermediate levels in many trade fields outside of the confinement of the University of Hawai'i's programs to one Classification of Instructional Programs (CIP) Code, as in the case of UHMC's Construction Technology Program: Detail for current CTEC Program CIP Code 46.0415

Title: Building Construction Technology.

Definition: A program that prepares individuals to apply technical knowledge and skills to residential and commercial building construction and remodeling. Includes instruction in construction equipment and safety; site preparation and layout; construction estimating; blueprint reading; building codes; framing; masonry; heating, ventilation, and air conditioning; electrical and mechanical systems; interior and exterior finishing; and plumbing.

The CTEC program's curriculum introduces and familiarizes students with industry knowledge and skills in multiple trades at a level that afford students the opportunity for gainful employment under many CIP Codes to include, but not limited to:

46) CONSTRUCTION TRADES.

46.00) Construction Trades, General.

46.01) Mason/Masonry.

46.02) Carpenters.

46.03) Electrical and Power Transmission Installers.

46.04) Building/Construction Finishing, Management, and Inspection.

46.05) Plumbing and Related Water Supply Services.

46.99) Construction Trades, Other.

47) MECHANIC AND REPAIR TECHNOLOGIES/TECHNICIANS.

47.00) Mechanics and Repairers, General.

47.01) Electrical/Electronics Maintenance and Repair Technology.

47.02) Heating, Air Conditioning, Ventilation and Refrigeration Maintenance Technology/Technician (HAC, HACR, HVAC, HVACR).

47.03) Heavy/Industrial Equipment Maintenance Technologies.

47.04) Precision Systems Maintenance and Repair Technologies.

47.99) Mechanic and Repair Technologies/Technicians, Other

52) CONSTRUCTION MANAGEMENT, OTHER

52.2001) Construction Management, General.

52.2002) Construction Project Management.

<https://nces.ed.gov/ipeds/cipcode/default.aspx?y=56>

See Section 6. Optional: Edits to Occupation List for Instructional Programs, for request for additional program CIP codes.

Check all that apply for the program:

 X Articulated Pathways for 4-year or graduate pathways: Construction Technology AAS-FMGT Concentration to UHWO BUS-FMGT BAS

 Articulated Pathways for High school: _____

 X Articulated Pathways for Other: Non-credit to Credit through Prior Learning Assessment (PLA)

What effect has this program had on closing equity gaps?

Equity gaps continue to persist as nontraditional workers in the fields of construction and facilities engineering and maintenance represent little more than 10% of employees in the fields. Further discussion of this obstacle and the program's ability to close gaps in this area are contained in other areas of this document addressing Perkins Indicators and in Section 2, Perkins Indicators.

2. Analysis of the Program/Unit

Discuss the Program's or Unit's strengths and areas to improve in terms of Demand, Efficiency, and Effectiveness based on an analysis of the program's Quantitative Indicators or comparable unit-developed measures or program-developed metrics. Include a discussion of relevant historical-trend data on key measures (i.e., last three years).

Discuss significant program or unit actions (new certificate(s), stop outs, gain/loss of position(s), results of prior year's action plan, etc.). Include external factors affecting the program or unit.

Instructional programs must include ARPD health indicators with benchmarks to provide a quick view on the overall condition of the program; CTE programs must include an analysis of Perkins Core indicators for which the program did not meet the performance level.

[insert ARPD data table, if available; else, insert unit or program specific data used for review]

Demand Indicators: **Healthy**

#	Demand Indicators	2018 - 19	2019 - 20	2020 - 21	Demand Health
1.	New & Replacement Positions (State)	4384	3564	3191	Healthy
2.*	New & Replacement Positions (County Prorated)	589	433	370	
3.	Number of Majors	73	66	54	
3a.	Number of Majors Native Hawaiian	17	15	14	
3b.	Fall Full-Time	37%	35%	32%	
3c.	Fall Part-Time	63%	65%	68%	
3d.	Fall Part-Time who are Full-Time in System	0%	0%	2%	
3e.	Spring Full-Time	38%	26%	25%	
3f.	Spring Part-Time	62%	74%	75%	
3g.	Spring Part-Time who are Full-Time in System	0%	0%	2%	
4.	SSH Program Majors in Program Classes	618	729	544	
5.	SSH Non-Majors in Program Classes	81	115	130	
6.	SSH in All Program Classes	699	844	674	
7.	FTE Enrollment in Program Classes	23	28	22	
8.	Total Number of Classes Taught	19	27	21	

NOTE: New & Replacement jobs updated ([View Methodology](#)).

Screenshot ARPDV 2021 Report
UHMC Construction Technology Program
<https://uhcc.hawaii.edu/varpd/index.php?y=2021&c=MAU&t=CTE&p=2404>

Job prospects remain strong for CTEC graduates and students that earn program certificates. With the addition of the Facilities Management Concentration in the CTEC program map, students are able to choose from an even broader range of careers. CTEC graduates regularly seek and are successful in gaining employment in numerous trades and facilities operations and maintenance career paths throughout the state of Hawaii, the mainland, and other geographic regions, traditionally not placing limits on themselves to accepting only the new and replacement positions (County Prorated) used to calculate the Demand Indicators. Additionally, many of the CTEC

Program's students are incumbent workers seeking to gain promotion or departmental transfers with their current employers through the acquisition of Certificates of Professional Development (CPDs), Certificates of Competence (COs), and Certificates of Achievement (CAs) offered in the CTEC Program Map.

According to the National Association of Homebuilders (NAHB), we continue face the largest amount of unfilled construction related replacement positions ever. The retirement of tens of thousands of baby boomer generation tradespersons each year, and now retirements, due to deaths and consequential decisions related to the Covid-19 pandemic, and a limited amount of interested replacement prospects over the next several years represent an ever-shrinking workforce. This ensures vast employment opportunities for CTEC students to apply the skills and knowledge recognized in the attainment of their CTEC certificates and degrees.

Efficiency Indicators: Healthy

#	Efficiency Indicators	2018 - 19	2019 - 20	2020 - 21	Efficiency Health
9.	Average Class Size	16	14	14	Healthy
10.*	Fill Rate	86%	74.1%	74.3%	
11.	FTE BOR Appointed Faculty	1	1	1	
12.*	Majors to FTE BOR Appointed Faculty	73	66	54	
13.	Majors to Analytic FTE Faculty	73	66	54	
13a.	Analytic FTE Faculty	2	2	2	
14.	Overall Program Expenditures	\$203,603	\$189,584	\$144,129	
14a.	General Funded Budget Allocation	\$146,829	\$144,765	\$134,831	
14b.	Special/Federal Budget Allocation	0	\$184	0	
14c.	Tuition and Fees	\$56,774	\$44,635	\$9,298	
15.	Cost per SSH				
16.	Number of Low-Enrolled (<10) Classes	3	3	1	

*Screenshot ARPDV 2021 Report
UHMC Construction Technology Program
<https://uhcc.hawaii.edu/varpd/index.php?y=2021&c=MAU&t=CTE&p=2404>*

Although the ARPD data indicates a “healthy” rating, student to faculty ratio continues to be concern for the sustainability of the program. With one FT Faculty position representing more than 60 students for the last seven years, and 54 in 2020-2021, the CTEC Program Advisory Committee has regularly declared and still maintains their position that the workload of one FT Faculty and the current Program Lecture staff does not support scheduling of classes and curriculum to meet industry educational requirements for specific trades, and strongly recommends that UHMC’s administration immediately approve a second full-time Faculty position for the CTEC Program.

In the summer of 2018, the CTEC Program’s sole full-time faculty member experienced a medical situation that almost left the program without a full-time faculty. As such, the current coordinator and sole-faculty that is responsible for the support of approximately 60 CTEC majors, required to

maintain and develop curriculum for an extremely diverse group of trades courses; and finds, hires, and provides logistical and procurement support for all of the lecturers involved in the CTEC Program. He is now contemplating retirement and this is a considerably difficult position to fill.

Prior to 2014, the duties were shared between two full-time faculty with less than 60 students, and produced significantly less productive results than the current sole faculty. It is the utmost priority of the CTEC program that UHMC's administration begin to search for qualified predecessors and allow for a position that capitalizes on the programs potential for growth and ensures a sustainable future for the program (see Section 5, Resource Implications).

Effectiveness Indicators: **Progressing**

#	Effectiveness Indicators	2018 - 19	2019 - 20	2020 - 21	Effectiveness Health
17.	Successful Completion (Equivalent C or Higher)	91%	85%	91%	Progressing
18.	Withdrawals (Grade = W)	7	22	4	
19.*	Persistence Fall to Spring	70%	62%	72%	
19a.	Persistence Fall to Fall	48%	35%	39%	
20.*	Unduplicated Degrees/Certificates Awarded	27	27	21	
20a.	Degrees Awarded	10	6	3	
20b.	Certificates of Achievement Awarded	9	7	3	
20c.	Advanced Professional Certificates Awarded	0	0	0	
20d.	Other Certificates Awarded	61	80	57	
21.	External Licensing Exams Passed ¹				
22.	Transfers to UH 4-yr	0	0	0	
22a.	Transfers with credential from program	0	0	0	
22b.	Transfers without credential from program	0	0	0	

*Screenshot ARPDV 2021 Report
UHMC Construction Technology Program
<https://uhcc.hawaii.edu/varpd/index.php?y=2021&c=MAU&t=CTE&p=2404>*

The decline in persistence fall to fall over the last two academic years, while a concern, mimics what is noticed in most programs during this time frame. Covid-19 and the uncertainty associated with social distancing guidelines, vaccine mandates and regulations has played havoc with the University's ability to deliver "hands-on" courses in the trades. Although the program was able to shift an abundance of coursework to online and Zoom platforms, much of what is taught in the program has to be instructed and observed in person. As such, students followed trends and quarantined through county and state lockdowns and decided against returning until more stable guidelines and mandates were provided. As we move forward with consistent Covid policies, it should be expected that a goal of 50% should be attainable in the next couple of years.

Perkins Indicators

#	Perkins Indicators	Goal	Actual	Met	
29.	1P1 Postsecondary Placement	33	93.33	Met	
30.	2P1 Earned Recognized Credential	33	64.1	Met	
31.	3P1 Nontraditional Program Concentration	N/A	N/A	N/A	
32.	Placeholder - intentionally blank	N/A	N/A	N/A	
33.	Placeholder - intentionally blank	N/A	N/A	N/A	
34.	Placeholder - intentionally blank	N/A	0	N/A	

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Although the Perkins Indicator 3P1 (formerly 5P1) indicates N/A, nontraditional program concentration continues to be a focus of CTE recruitment for the program. Previous goals in this area always indicated as ‘Unmet’ due to inflated nontraditional goals that were always out of reach according to industry trends.

With Perkins goals in this area that often exceeded 20%, and actuals ranging from 7-11% in previous years, the CTEC Program Advisory Committee suggest that a goal of 12-15% would be a more realistic goal to strive for. According to industry resources, “Of all the people working in construction, women comprise only 10.3 percent. Even smaller is the number of women on the front lines of a job site—only one for every 100 employees in the field. Considering that women make up 47 percent of all employed individuals, this means that the construction industry is only benefitting from about 1.25 percent of women in the workforce”.

Other obstacles that nontraditional students face in the construction industry also need to be considered and addressed:

- Pay Gap- 43% of organizations do not actively monitor gender pay gaps
- Advancement- 73% of women feel passed over for roles because of their gender
- Injury- Women have a higher risk of injury due to poorly-fitted equipment
- Discrimination- 80% of gender discrimination victims in the workplace are women
- Exclusion- 8 out of 10 women feel left out at company social events
- Role Models- 47% of women have never worked with a manager who is a woman

<https://www.bigrentz.com/blog/women-construction>
Women in Construction: The State of the Industry in 2021

Ultimately, we need to do a better job of telling the stories of women in construction. When young women see themselves reflected, and hear the real stories of other women doing these jobs, they are more likely to consider it as a career. As such, the program has recently recruited women in the industry to serve on the Advisory committee and is looking into support for our students through organizations like the National Association of Women in Construction (NAWIC).

3. Program Student Learning Outcomes or Unit/Service Outcomes

a) List of the Program Student Learning Outcomes or Unit/Service Outcomes

Program Student Learning Outcomes:

Upon successful completion of the Construction Technology Program, the student should be able to:

1. Use and maintain appropriate materials, tools, equipment, and procedures to carry out tasks performed on construction projects according to safety and industry standards.
2. Use math, computer, and oral and written communication skills to solve construction project problems.
3. Create and maintain accurate documentation of construction and maintenance projects.
4. Describe industry standard Green Building practices in construction and maintenance projects.
5. Read and interpret blueprints, and/or schematics, and specifications to plan projects.
6. Demonstrate the craftsmanship standards of dependability, punctuality, and quality.
7. Examine and use proper mechanical, electrical, and carpentry codes and standards applicable to construction and repair.

b) Program or Unit/Service Outcomes that have been assessed in the year of this Annual Review.

Due to the broad spectrum of trade specific courses in the CTEC Program curriculum, the CTEC Program assesses all PLOs in relation to specific courses each year. The CTEC Program Assessment team met on April 7, 2021 to assess PLOs and CASLOs for the following courses:

- ELEC 100- Survey of Electrical Math & Physics
- ELEC 110- Residential and Light Commercial Wiring
- MAIN 155- Plumbing II

c) Assessment Results.

- a. PLO: Provide a summary of the method used for assessment i.e., exit project or capstone results, proficiency standards, stakeholders participating in the assessment process, how the data was collected/analyzed, and the results. For brevity, include a link to complete assessment reports from the Academic Affairs website or include your write-up in the appendix.

Participants:

- Clifford Rutherford, UHMC Assistant Professor of Vocational Education, CTEC Program Coordinator
- Clifford Ryden, CTEC Program Advisory Committee Chair, President- Blue Pacific Energy LLC
- Tamzen Lovejoy, Dorvin Leis, Director of Human Resources, CTEC Advisory Committee Member

- Lawrence Martinson, Instructor/Program Coordinator, UHMC Automotive Technology Program

Complete PLO/CASLO assessment results can be found on pages 1-6 of the Spring 21 CTEC Program Assessment Report at:

https://drive.google.com/file/d/1fHiESNuWW1FvyuieXeImqGPKcSb8_cuS/view

Artifacts Examined: Access and overview of individual course Laulima Learning Management System websites provided by instructor for assessment participants for courses: ELEC 100 (CRN 46319, SP 21), ELEC 110 (CRN 45376, FA 20), and MAIN 155 (CRN 46323, SP 21).

- Student Assessment Results:
 - Chapter Reviews and Quizzes
 - Midterm and Final Exams
 - Attendance and Participation
 - Gradebooks
- Course Resources:
 - Course Syllabi
 - Textbooks
 - Posted weekly chapter presentations, supplemental videos, virtual labs, internet links and class announcements
 - Scaffolded class demonstrations, activities, and assignments

Process: Artifacts were examined for evidence identifying coursework that show students meeting PLOs at introductory, developmental and mastery proficiencies expected for entry level industry positions.

- b. CASLO: Provide a summary of CASLO assessment in the year of this annual review.

- i. Identify CASLO and program's assessment method CASLOs

During the PLO assessment process, team members were also tasked with using the same artifacts from the ELEC 100, ELEC 110, and MAIN 155 courses to determine where different aspects (written communication, quantitative reasoning, information literacy, oral communication, critical thinking, and creativity) and at what levels of student learning or CASLOs happened in each course.

- ii. Provide a summary of the analysis, results, and recommendations

As the assessment team reviewed the evidence for each course, they were able to determine where different aspects of student learning were coming from that were not expected. In the courses assessed at this time, there are writing, and communication related assignments addressing soft skills found in the course resources, textbooks and assignments that develop these soft skills.

Summarily, it is found that students that succeed in all three of the assessed

courses develop significant Quantitative Reasoning and Critical Thinking skills through the current curriculum in these classes. However, conformity to nationally recognized trades codes and practices limits the students' ability to develop in the areas of Written and Oral Communication, Information Literacy, and Creativity.

Complete CTEC program CASLO assessment results can be found on pages 6-13 of the Spring 21 CTEC Program Assessment Report at:

https://drive.google.com/file/d/1fHiESNuWW1FvyuieXeImqGPKcSb8_cuS/view

d) Changes that have been made as a result of the assessment results.

Results:

ELEC 100- Survey of Electrical Math & Physics

Assessment of the ELEC 100 course found the following changes from previous assessments are supported by the evidence presented:

- PLO 1 from N/A to introduces this PLO
- PLO 2 from develops this PLO to assesses mastery of this PLO
- PLO 3 from introduces this PLO to develops this PLO
- PLO 6 from introduces this PLO to develops this PLO
- PLOs 4, 5, and 7- PLO levels assessed as remaining consistent with previous ELEC 100 course assessment.

ELEC 110- Residential and Light Commercial Wiring

Assessment of the ELEC 110 course found the following changes from previous assessments are supported by the evidence presented:

- PLO 1 from demonstrates to assesses mastery of this PLO
- PLO 3 from N/A to introduces this PLO
- PLO 6 from introduces this PLO to develops this PLO
- PLO 7 from demonstrates to assesses mastery of this PLO
- PLOs 2, 4 and 5- PLO levels assessed as remaining consistent with previous ELEC 110 course assessment.

MAIN 155- Plumbing II

Assessment of the MAIN 155 course found the following changes from previous assessments are supported by the evidence presented:

- PLO 3 from N/A to develops this PLO
- PLO 6 from develops this PLO to assesses mastery of this PLO
- PLOs 1, 2, 4, 5, and 7- PLO levels assessed as remaining consistent with previous ELEC 110 course assessment.

It was concluded by the assessment team that no major changes were required in the curriculum or instruction of the courses assessed in their review, other than as noted above.

4. Action Plan

Based on findings in Parts 1-3, develop an action plan for your program or unit from now until your next Comprehensive Review date. Be sure to focus on areas to improve identified in ARPD data, student learning or unit/service outcomes, results of survey data, and other data used to assess your program or unit. This plan should guide your program/unit through to the next program/unit review cycle and must detail measurable outcomes, benchmarks and timelines. Include an analysis of progress in achieving planned improvements.

* CTE programs must include specific action plans for any Perkins Core Indicator for which the program did not meet the performance level.

Specify how the action plan aligns with the College's Mission and Strategic Plan.

Address opportunities for re-envisioning the program. How does the plan address emerging or future economic opportunities? What is the projected industry/community demand in 5-6 years?

Discuss how these recommendations for improvement or actions will guide your program or unit until the next Comprehensive Review. Be sure to list resources that will be required, if any, in section 5 below.

*The action plan may be amended based on new initiatives, updated data, or unforeseen external factors.

The vision for the CTEC Program remains the same and aligns with UHMC's Strategic Directions, especially in the objectives of Community Needs and Workforce Development. As the program was recently re-envisioned through advisory committee recommendations and the entire program map and related curriculum was updated beginning in the fall of 2020, and the industry's high demand for our students remains unchanged, the program will continue to focus its actions in the following areas:

Online and Hybrid Course Options

The complexity of hands-on demonstration and safety assessment of the skills and proficiencies required to complete many of the Student Learning Outcomes of the majority of the trades related courses in the CTEC program make it difficult to offer these courses in an online, hybrid, or skybridge modality.

Adapting to "the new normal" during the onset of the Covid-19 pandemic, the CTEC program courses were completed using various hybrid and online methods. While "hands-on" labs have continued to be taught in person on campus throughout the Covid-19 pandemic, in many cases instructors that teach the lecture/lab CTEC program courses have been offering the lecture portion of courses online using Lulima and Zoom, bringing students to the campus in smaller groups for the lab portion of the course.

As many CTEC students are considered kinesthetic learners, it was expected that there might be some difficulty in retaining a portion of students in the courses that were moved online. Both

students and instructors proved to adapt well overall, with minimal retention issues. However, conversations with students indicate that a large portion of our CTEC student body prefer in-person instruction as opposed to hybrid or online.

After considering the input of instructors, students and program advisors, lecture courses and lecture portions of lecture/lab courses previously offered “face-to-face” in the CTEC Program curriculum that will continue to be offered in online or hybrid platforms in the 2021-2022 and 2022-2023 academic years include: AEC 110 (4 credits), ELEC 100 (3 credits), ENRG 101 (3 credits), ENRG 103 (3 credits), FMGT 100 (2 credits), MAIN 155 (2 credits), MAIN 166 (1 credit), OSH 100 (1 credit) and OSH 110 (1 credit).

Prior Learning Assessment (PLA)

Offering students the opportunity to be awarded college credit for previous industry experience or non-credit training is also an opportunity for UHMC to recruit students into the program. The CTEC program maintains an articulation agreement with UHMC’s non-credit programs that benefits participants in their building and construction courses with like student learning outcomes. CTEC program map courses articulated with non-credit through PLA include: CARP 120(3), FMGT 100(2), MAIN 166(1), OSH 100(1), and OSH 110(1).

Students wishing to receive credit for the non-credit courses must enroll in the CTEC program in order to be granted credits toward their degree. Upon enrollment and declaration of their major in the UHMC CTEC program, students that have successfully completed the articulated non-credit courses may apply through UHMC’s PLA process to obtain credit/s for the coursework completed in the non-credit courses towards the completion of their CTEC Associate Degree or CTEC Certificate of Achievement.

CTEC program coordinator records show 28 credits having been awarded to students through the Building Maintenance articulation with our non-credit courses since 2017 and more are in progress for award in Fall 2021. As course offerings in both credit and non-credit programs are updated, the CTEC Program will continue to maintain and expand articulation agreements to the benefit of both programs and their students. Additionally, CTEC program advisors are in discussion to consider PLA for Department of Education (DOE) building and construction course students to qualify for PLA for either the CARP 120 or FMGT 100 courses through testing.

Full-time Faculty

See Section 2, Analysis of the Program/Unit, Efficiency Indicators and Section 5, Resource Implications, FTE C-2 Construction Technology (CTEC) Instructor Position, 9-month, tenure track.

Lecturers

The prospects of recruitment of trades professionals to teach CTEC courses is and always has been difficult. Most all professionals in a given trade can make substantially more practicing their trade than teaching it. Also, many people that are qualified belong to a trade union and teaching non-union courses violates their union non-compete clause, placing their retirement and benefits in jeopardy.

The CTEC program has run a continuous ad for lecturers over the last several years with minimal response and regularly relies on advisory committee members to lecture and also recommend strategies for recruitment in this area. The program will continue to find ways to broaden the appeal to our community's journey-workers and tradespersons for support in this area.

CTEC Program Outreach and Support

Over the course of the last few years, students on the island of Molokai have been able to take several CTEC program CARP, MAIN, and ELEC courses coordinated and collaborated through Molokai Outreach Center CTE Transition Coordinator and the UHMC CTEC Program Coordinator resulting in numerous certificates being awarded and helping CTEC major numbers to remain stable during the Covid19 pandemic.

The establishment of the Molokai CTEC Transition Program Coordinator position in Perkins grant year 1 has allowed our CTEC program to extend our reach to vulnerable populations that are traditionally underrepresented in higher education. In Spring 2021 alone, 8 students earned Certificates in Construction Technology and 75% (6/8) students were of Native Hawaiian ancestry. One graduate was an Early College student from Molokai High School. The position is extremely crucial to the ability of the CTEC program to offer courses through outreach on Molokai and in counseling the Outreach Center's students through our program's in-person, online, and hybrid offerings.

Due to the "hands-on" nature of building and construction trades courses, travel and budget restrictions, and materials and equipment procurement and transportation, offering these courses to UHMC's Outreach Center on Molokai would be impossible without the support of the Molokai Outreach Center CTE Transition Coordinator. While also facilitating other CTE programs, including Nursing Assistant and Early College, to offer courses through the Outreach Center, Molokai's Transition Coordinator has been instrumental in the search and hiring of lecturers on Molokai to teach the CTEC program courses being offered there, securing equipment and materials from local and off-island resources, and arranging for the transportation of items shipped from the Kahului campus to Molokai.

The CTEC Program supports any and all requests for continued funding for this Perkins Grant funded position and looks forward to the opportunity to offer further outreach opportunities, with the assistance of this position, for our students on the island of Molokai.

Physical Resources

As noted in the program's prior Program Reviews, the Carpentry, Vocational and Welding Shops require numerous items to keep up with industry standards and safety concerns. These items should be of concern and priority. The program operates out of buildings that were constructed circa 1949 and slightly after. Many of the resources in the buildings are original to the buildings or are antiquated to the point of being obsolete or in ill repair and should be replaced. This includes the termite eaten benches and missing dust collection system in our carpentry shop, old welding machines, and other obsolete tools and equipment to be addressed in Section 5, Resource Implications, of this document.

5. Resource Implications

Detail any resource requests, including reallocation of existing resources (physical, human, financial). *Note that CTE programs seeking future funding via UHCC System Perkins proposals must reference their ARPD Section 4. Action Plan and this ARPD Section 5. Resource Implications to be eligible for funding.

What is the cost? How can your program plan to reduce cost and streamline? Could elements of this program be combined with another program? Discuss any potential system partnerships and/or opportunities for collaboration.

 **I am requesting additional resources for my program/unit.**

Combining the CTEC program with others is not an option. While the program incorporated courses in business, economics, and sustainable sciences into the recent addition of the Facilities Management concentration, trades classes require specific skills and resources to be used. Also, recent UH system changes now have other campuses modeling their programs after the UHMC CTEC program. However, many of the CTEC program's needs have not changed over the years and items asked for in previous budget requests still need to be addressed.

PRIMARY PROGRAM BUDGET REQUESTS STILL NEEDED AS REQUESTED IN PREVIOUS PROGRAM REVIEWS:

FTE C-2 Construction Technology (CTEC) Instructor Position, 9-month, tenure track

Base Salary: \$55,858 (2017-2021 UHPPA/BOR Contract), or current rate + fringe. It is expected that a portion of CTEC program lecturer Teaching Equivalencies (TEs) would be converted to facilitate this request, creating some cost savings for the program.

Although it is acknowledged that there are significant budgetary obstacles for the University of Hawai'i to overcome as a result of the economic effects of the Covid-19 pandemic; and as the University of Hawai'i System, Hawai'i Department of Education, the U.S. Department of Labor, and UHMC's Chancellor's office continue to request and champion partnerships and initiatives that involve CTEC program offerings and resources; and that the current faculty is already serving at maximum capacity in their position: in not asking for additional resources, it will be understood by UH Maui College and UH System administration that there would be no room for program growth and the program will run at a deficit or status quo at best. Acquisition of this position is also time sensitive. It should be considered that many qualified candidates that might fill behind in the place of someone leaving the current faculty position as coordinator will still require extensive training and knowledge of policies and procedures gained over time to establish the collegiate and community alliances to maintain a vibrant program.

UH Maui College and UH System administration would be remiss to ignore the potential for growth and the long-term sustainability of a program that provides ample evidence for the continued request for another full-time faculty, especially in light of past accreditation team and advisory committee recommendations:

“We believe that the teaching requirements and institutional demands placed on the Program Coordinator are well beyond what one person should be required to fulfill. There are numerous areas that the Program Coordinator could be more productive if the CTEC Program is able to secure a second faculty position. These areas include but are not limited to: high school and industry outreach efforts, new class development and aligning of the Program to National Standards to provide additional National recognized certification to the Program and students. As noted in WSCUC accreditation team recommendations from their April 2-5, 2014 and January 31-February 5, 2017 visits, a program serving more than 60 students (and more than 75 in the Fall 2017 semester), such as the CTEC Program, cannot rely on one individual for perpetuity.”

*Construction Technology Program Advisory Committee
Letter of Support for CTEC Program*

NEW PRIMARY PROGRAM BUDGET REQUESTS:

Increase CTE General Fund Department Operating Budget from \$23,250 to \$35,000

Over the last two budget cycles the CTE Operating budget has been drastically cut 25% from \$31,000 to \$23,250, to be shared by the Construction Technology, Automotive/Auto Body, and Fashion Technology programs, severely reducing our ability to replicate real-world construction tasks and scenarios. During the same timeframe, costs of practically all material resources, especially expendables, for the aforementioned programs have increased exponentially due to material shortages, production and transportation costs, and an extremely competitive construction and housing market. For example: one sheet of ½” plywood for a basic carpentry class that cost \$29-\$32 two years ago now sells for \$48, a cost increase of more than 30%. Additionally, the Automotive program is facing rising disposal costs for hazardous materials such as fluids, tires and batteries. These examples are par for the costs of all of our CTE programs. Although rapidly rising costs for products and services used for instruction and operation of these programs is projected to level off in the future (at a higher cost than before budget cuts), these programs cannot be expected to continue to offer quality instruction and curriculum operating on a budget of less than what is being requested.

SECONDARY PROGRAM BUDGET REQUESTS STILL NEEDED AS REQUESTED IN PREVIOUS PROGRAM REVIEWS:

12 ea. Multiprocess Welding Machines 1/3 Phase 408/250 Volt

Estimated Cost \$125,000 (approx. \$10,000 ea. + taxes and shipping)

The purchase of new equipment for replacement and repair of 20–35-year-old equipment at the existing building voltage/phase would allow the students to learn on current industry standard equipment, enhancing their employability in the construction and automotive industries. According to the VARDP Reports and current campus reports, the CTEC and AMT Programs at UHMC consist of approximately 120+ annual majors collectively. This class is required or a technical elective for all majors in the AMT, CTEC and AG Programs. Current equipment, when functioning, does not allow for this and only allows for 8 AMT and 8 CTEC program (total 16) students to be taught currently in the WELD 119C- Welding for Automotive Applications (MIG and Gas) and WELD 119D- Welding for Construction Applications (Arc and Gas) courses. Therefore, there are

not always enough seats available each semester to allow for students to complete the requirements or electives of their respective programs.

The new equipment will allow up to four (4) additional credit program students to be served each semester. With the new equipment being able to be used for multiple welding techniques and materials, updates to current curriculum, to include TIG welding, and intermediate and advanced welding courses, it will better serve the needs of our CTE students seeking employment in our community and the Plumbers and Pipefitters apprenticeship program that will have access to the equipment for their required training classes.

Purchase specifications should be equivalent to or greater than: Miller XMT 350 CC/CV Multiprocess Welder with Feeder, Accessory Package, And Cart (951786):

<https://www.weldingsuppliesfromioc.com/miller-xmt-350-cc-cv-multiprocess-welder-with-feeder-accessory-package-and-cart-951786>

Carpentry Shop Workbenches (10 each)

Estimated Cost: \$12,000-\$14,000 (\$1,200 ea., does not include shipping)

The current workbenches in the Carpentry Shop are more than 50 years old and are in very poor condition due to active and former termite infestation and excessive use. These “homemade” benches are not salvageable and must be replaced. As noted previously, the Carpentry Shop serves approximately 150 Carpentry Apprenticeship Training Program and 55-70 CTEC Program students each semester.

Appropriate workbenches should include:

- Steel Legs (adjustable height 29”-39”)
- Minimum size of 30” x 60” x 2” Oak Butcher-block top
- 2 ea. Carpenter’s Woodworking Vice

Dust Collection System for Carpentry Shop

Estimated cost including infrastructure improvements: \$20,000-\$30,000

The Carpentry Shop serves approximately 150 Carpentry Apprenticeship Training Program and 65-70 CTEC Program students each semester. The defunct industrial dust collection system for the Carpentry Shop was dismantled and disposed of in the 1990s and has not been replaced.

In some cases, portable dust collectors have been temporarily used at individual tool locations to mitigate atmospheric saw dust, but with poor results. Proper dust collection and air filtration is important in any work space. Repeated exposure to wood dust can cause chronic bronchitis, emphysema, “flu-like” symptoms, and cancer. Wood dust also frequently contains chemicals and fungi, which can become airborne and lodge deeply in the lungs, causing illness and damage. These things create health and safety concerns for all students and faculty using the Carpentry Shop.

As the decommissioned dust collection system provided for an antiquated shop with larger capacity tools with more exposure to dust particulates, and the current equipment emits less particulate matter in a smaller footprint, the system will need to be sized to meet the needs of the current teaching environment. Additional infrastructure improvements include structural supports, overhead ducting, and electrical power to the collection unit/s.

6. Optional: Edits to Occupation List for Instructional Programs

Review the Standard Occupational Classification (SOC) codes listed for your Instructional Program and verify that the occupations listed align with the program learning outcomes. Program graduates should be prepared to enter the occupations listed upon program completion. Indicate in this section if the program is requesting removal or additions to the occupation list.

 **I am requesting changes to the SOC codes/occupations listed for my program/unit.**

Current CTEC Program CIP code applies and is appropriate for the following concentrations:

AAS CTEC, Building Maintenance & Construction (BUCO) Concentration

AAS CTEC, Facilities Mechanical (FMEC) Concentration

Detail for CIP Code 46.0415

Title: Building Construction Technology/Technician.

Definition: A program that prepares individuals to apply technical knowledge and skills to residential and commercial building construction and remodeling. Includes instruction in construction equipment and safety; site preparation and layout; construction estimating; blueprint reading; building codes; framing; masonry; heating, ventilation, and air conditioning; electrical and mechanical systems; interior and exterior finishing; and plumbing.

While the above CIP code applies and is appropriate for two of the concentrations in the CTEC Program, the addition of the Facilities Management concentration to the program map in Fall 2020 requires proposing the addition of second CIP code to be associated with the CTEC program.

Although students pursuing this concentration may take some of the courses in the above BUCO and FMEC concentrations, the following CIP reflects the qualifications and jobs for graduates of the FMGT concentration and is requested in addition to the above program CIP.

Requesting **ADDITIONAL** CIP code for the following concentration:

AAS CTEC, Facilities Management (FMGT) Concentration

Detail for CIP Code 52.2002

Title: Construction Project Management.

Definition: A program that prepares individuals to apply project management knowledge, skills, tools, and techniques in the construction and facility management industries. Includes instruction in facilities operations and maintenance, construction estimating, OSHA standards, sustainability,

drafting, construction plans, project planning, risk management, cost and time management, contracts and procurement, accounting, statistics, decision making, and human resources.

Citations:

<https://www.bloomberg.com/news/articles/2021-01-15/finding-workers-is-getting-harder-for-busy-u-s-homebuilders>

<https://www.adp.com/spark/articles/2019/02/construction-grows-but-baby-boomers-retiring-leaves-gap.aspx>

<https://www.bigrentz.com/blog/women-construction#:~:text=When%20you%20think%20of%20an,100%20employees%20in%20the%20field.>

<https://www.bigrentz.com/blog/women-construction>

<https://constructionblog.autodesk.com/women-in-trades/>