New Program Proposal
Certificate of Achievement (CA)
Automotive Green Technology
## Table of Contents

**Introduction** .................................................................................................................................1

I. What are the objectives of the program? .........................................................................................1
   Program Learning Outcomes .............................................................................................................2

II. Are the program objectives appropriate functions of the college and University? .............2-10
   Alignment with UHCC System and Kauai CC Goals .................................................................4
   Needs Assessment .............................................................................................................................5
   Impact on our State’s Economic Development ..............................................................................6
   Industry Needs .................................................................................................................................9

III. How is the program organized to meet its objectives? ...............................................................11
   Curriculum Plan ..............................................................................................................................11
   Proposed Automotive Green Technology program pathways .......................................................12

IV. Who will enroll in the program? ..................................................................................................12-13
   Target groups ...............................................................................................................................12
   Advisory Committee Approval .......................................................................................................13
   Marketing ..........................................................................................................................................13

V. What resources are required for program implementation? ....................................................13-16
   Cost and Revenue Narrative .........................................................................................................13
   Academic Cost and Revenue Template .........................................................................................16

VI. How efficient will the program be? .............................................................................................17

VII. How will effectiveness of the program be demonstrated? .......................................................17-18

VIII. References ...............................................................................................................................18

IX. Appendices ..................................................................................................................................19-30
   Appendix A: Curriculum ................................................................................................................20
   Appendix B: Program Action Request ..............................................................................................22
   Appendix C: Letters of Support .........................................................................................................24
Introduction

The University of Hawaii Kauai Community College (Kauai CC) is proposing a program in Automotive Green Technology to meet workforce development needs as Hawaii and the rest of the world address sustainability in a green economy. The Hawaii Clean Energy Initiative (HCEI), a partnership between the State of Hawaii and the U.S. Department of Energy, seeks to reduce Hawaii’s dependence on imported fossil fuels by achieving a goal of 70% clean energy by the year 2030. Currently Hawaii leads the nation as the most oil-dependent state with more than 95% of its energy demand coming from imported fuels. To reduce consumption of petroleum within the transportation sector, Hawaii is looking at plug in electric vehicles (EV) as well as other alternative transportation solutions to address the challenges of modernizing its energy system and building a clean transportation future.

Green occupations will likely change in this new green economy as vehicle manufacturers address the global needs. Kauai Community College will provide training to prepare entry-level technicians in this enhanced skills occupation of maintenance and repair on hybrid and electric vehicles for a sustainable green future.

I. What are the objectives of the program?

The Automotive Green Technology program is a competency-based program designed following standards specified by the National Automotive Technicians Education Foundation (NATEF). As the demand for fossil fuel increase along with its sky rocketing prices, the country along with the rest of the world is pursuing alternative energy solutions along with being globally responsible for a sustainable future. In order to meet global changes in clean energy, the automotive industry has gone green with Hybrid and Electric Vehicles, and we must keep pace with technology and train students at industry standards. According to the Department of Energy, electric vehicles convert about 59-62 percent of the electrical energy from the grid to power at the wheels, while conventional gasoline vehicles convert only about 17-21 percent of the energy stored in gasoline to power at the wheels. So a gallon of fuel is as much as 45 percent more efficient when burned by the utility company and transferred to an electric vehicle than when burned in the gas tank of a conventional car. Electric vehicles will decrease the amount of petroleum needed for transportation and simultaneously enabling an increase in the amount of variable renewable energy, like wind and solar, that electric utilities can accommodate by providing a distributed network of batteries to store excess energy. Electric vehicles can also charge on otherwise curtailed wind power when overall demand is at its lowest. Overall, electric vehicles are more fuel-efficient vehicles, whatever the source of power. If an electric vehicle receives energy from renewable energy sources, then no fossil fuels are burned or emitted from either the tailpipe or the utility company—a double win.

The program offers training in sustainable green energy with Hybrid and Electric Vehicle (HEV) technology to meet the industry needs. This program will prepare participants for an entry-level position in the automotive mechanics industry by introducing the basic knowledge and understanding needed for maintenance and repair of HEVs along with safety handling procedures while working on high voltage electrical systems.
The Automotive Green Technology program courses are clustered into certificates, each providing a set of marketable workplace skills. The Certificates of Competence in HEV Preventive Maintenance and Repair and HEV Diagnostic and Repair will lead to a Certificate of Achievement in Automotive Green Technology.

The goals of the program are to prepare the student with the skills and competencies necessary for a successful career as an automotive technician, to instill in the student the work habits and attitude necessary to work in a highly competitive field, and to provide the student with the basic skills necessary to become a lifelong learner in order to keep abreast of the latest technological changes in the automobile.

Program Learning Outcomes:
Upon successful completion of the Automotive Green Technology Program the student will be able to:
• Demonstrate technical proficiency in entry-level skills for employment in the automotive service field or related areas.
• Apply the theory behind automotive procedures and use critical thinking when performing service, maintenance, diagnostics, and repair of all major automotive systems.
• Comply with personal and environmental safety practices in accordance with applicable safety and environmental regulations.
• Identify and use appropriate tools, testing and measuring equipment required to accomplish each task established by National Automotive Technicians Education Foundation (NATEF).
• Locate references, training information and manufacturer’s procedures from industry resources using the appropriate technology and will be able to perform tasks in accordance with their research.
• Perform all diagnostic and repair tasks in accordance with manufacturer’s recommended procedures as published.
• Communicate effectively both orally and in writing.

II. Are the program objectives appropriate functions of the college and University?
As part of the Hawaii Clean Energy Initiative, Hawaii has become a national leader in establishing policies designed to promote the electrification of transportation. The following list of policies adopted by Hawaii State Legislature were the first of their kind in the United States and have significantly contributed to the decision of EV manufacturers to target Hawaii as early launch market for EVs.
• Free parking in State and County Government lots and facilities including parking meters (Act 168 of 2012 formerly Act 290 of 1997)
• Access to High Occupancy Vehicle (HOV) lanes (Act 168 of 2012)
• Public accommodations with at least one hundred parking spaces available for use by the general public shall have at least one (1) parking space exclusively for EVs and be equipped with an EV charging system. (Act 089 of 2012, formerly Act 156 of 2009)
• EV charging station requirements in multi-family residential dwellings or townhouse (Act 186 of 2010)

Growth in Hawaii’s EV market has also attracted emerging new technologies and projects, national and international business investments, federal funding, and smart grid projects. The arrival of mass market EVs presents an opportunity for Hawaii to reduce imported oil while boosting economic development and strengthening Hawaii’s energy and economic security.

Kauai Community College will embrace this emerging new technology by providing the support to prepare for the workforce needed to maintain electric vehicles. The program aligns with the UHCC system and Kauai CC Strategic Goals. Integration of academics with career and technical training is achieved by applying competency based tasks with new green technology of hybrid and electric vehicles to promote workforce and economic development that previously was not available. Our program will be better prepared to provide trained entry-level technicians in a globally competitive field following NATEF and industry standards. The development of services and activities that integrate rigorous and challenging academic, career and technical instruction to enhance the technical skills of postsecondary education students will respond to the community and industry needs.

This initiative will improve, expand and modernize the quality of our career and technical program including relevant sustainable technology to promote Learning and Teaching for Student Success. Sustainability in global green economy activities and technologies are increasing the demand for occupations, shaping the work and worker requirements needed for occupational performance, and generating new and emerging occupations. Electric vehicle repair is a Green Enhanced Skills occupation with new tasks, skills, knowledge, and credentials required that Kauai CC will meet by providing training to safely and properly work on these vehicles.

The program will provide the students with the basic skills necessary to become a lifelong learner in order to keep abreast of the latest technological changes in the automobile and develop a sustainable infrastructure for student learning by training with new “Green” technology of alternative energy in automobiles.

Kauai CC Automotive Green Technology program spearheaded the initiative to bring all UHCC automotive programs together to function as a seamless state system with training on Hybrid and Electric vehicles. Kauai CC coordinated a 5-day training event for twelve of our automotive instructors hosted at our new training facility in May 2014 to become certified by the Society of Automotive Engineers (SAE) International on Advanced HEV Diagnostics. Collaboration with all programs and curriculum developed on our HEV courses were shared to be consistent during articulation between the programs.
Alignment of Program with UHCC system and Kauai CC
The proposed CA in Automotive Green Technology Program is in alignment with the UHCC system and Kauai CC Strategic goals. The UHCC Strategic Goals are listed below followed by the associated Kauai CC Mission and Goals.

A. UHCC and Kauai CC Strategic Plan Goals

UHCC GOAL A: Educational Effectiveness and Student Success

- *Promote Learning & Teaching for Student Success*

KauaiCC A.1 Access – To provide open access to educational excellence for a diverse student population.

KauaiCC A.2 Learning & Teaching – To promote excellence in learning and in teaching for transfer, career/technical, remedial/developmental education and life-long learning.

UHCC GOAL B: A Learning, Research, and Service Network

- *Functions as a seamless state system*

KauaiCC B.3 Workforce Development – To provide a trained workforce by offering programs that prepare students for both employment and future career development.

KauaiCC B.5 Community Development – To contribute to community development and enrichment through campus leadership and collaboration.

UHCC GOAL C: A Model Local, Regional, and Global University

- *Promote Workforce and Economic Development*

KauaiCC C.5 Community Development – To contribute to community development and enrichment through campus leadership and collaboration.

KauaiCC C.6 Diversity – To foster global understanding and appreciation for diversity.

UHCC GOAL D: Investment in Faculty, Staff, Students, and Their Environment

- *Develop our Human Resources: Recruitment/Retention/Renewal*

KauaiCC D.4 Personal Development – To provide life-long learning opportunities in the areas of personal and professional development.

UHCC GOAL E: Resources and Stewardship

- *Develop Sustainable Infrastructure for Student Learning*

KauaiCC E.2 Learning & Teaching – To promote excellence in learning and in teaching for transfer, career/technical, remedial/developmental education and life-long learning.
B. Kauai Community College Mission Statement
Kauai Community College provides open access education and training in an ethical and innovative student-centered and community-focused environment, nurturing life-long learners who appreciate diversity and lead responsible and fulfilling lives.

C. Kauai CC Goals

- Access – To provide open access to educational excellence for a diverse student population.
- Learning & Teaching – To promote excellence in learning and in teaching for transfer, career/technical, remedial/developmental education and life-long learning.
- Workforce Development – To provide a trained workforce by offering programs that prepare students for both employment and future career development.
- Personal Development – To provide life-long learning opportunities in the areas of personal and professional development.
- Community Development – To contribute to community development and enrichment through campus leadership and collaboration.
- Diversity – To foster global understanding and appreciation for diversity.

Needs Assessment
In 2010, the Obama administration set new fuel-economy and carbon-pollution limits to improve fuel economy and reduce the dependence on imported oil. Fuel-economy and carbon-pollution standards for 2012 to 2016 model cars sparked job growth in automobile manufacturing and increased automobile sales with vehicles having an average fuel economy of 34.5 miles per gallon. By 2012, the auto industry added over a quarter-million jobs—236,000—while they worked to comply with the fuel-efficiency standards. The fuel-economy and carbon-pollution standards set for 2017 to 2025 is projected to double the fuel economy and reduce oil use by 2 million barrels per day. The Center for Climate and Energy Solutions describes these Federal Vehicle Standards. [http://www.c2es.org/federal/executive/vehicle-standards](http://www.c2es.org/federal/executive/vehicle-standards).

President Obama’s goal of putting one million electric vehicles on the road by 2015 was a key milestone toward dramatically reducing dependence on oil and ensuring that America leads in the growing electric vehicle manufacturing industry. Leading vehicle manufacturers already have plans for cumulative U.S. production capacity of more than 1.2 million electric vehicles in 2015. President Obama proposed steps to accelerate America’s leadership in electric vehicle deployment, including improvements to existing consumer tax credits, programs to help cities prepare for growing demand for electric vehicles and strong support for research and development. The full report by the Department of Energy may be viewed at: [http://www1.eere.energy.gov/vehiclesandfuels/pdfs/1_million_electric_vehicles_rpt.pdf](http://www1.eere.energy.gov/vehiclesandfuels/pdfs/1_million_electric_vehicles_rpt.pdf)
Proposed CA in Automotive Green Technology

KauaiCC will provide training with modernized technology of going “Green” as the automotive industry pursues alternative energy with the national employment of automotive service technicians and mechanics expected to increase by 17 percent between 2010 and 2020. Statistics by the U.S. Bureau of Labor projected the increase listed below: See

http://www.bls.gov/oco/ocos181.htm

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Automotive Service Technicians and Mechanics</td>
<td>49-3023</td>
<td>723,400</td>
<td>848,200</td>
<td>17</td>
<td>124,800</td>
</tr>
</tbody>
</table>


Impact on our State’s Economic Development

The Maui Electric Vehicle Alliance (Maui EVA), funded by the Department of Energy Clean Cities EV Community Readiness Grant and associated cost-share partners and based at the University of Hawaii Maui College is leading the efforts in awareness, education and research for electric vehicle deployment in Hawaii. Maui EVA met with electric vehicle stakeholders on each of our islands in 2013 along with the Center of Law, Energy and Environment at the University of California, Berkeley School of Law. They provided research findings and reported on how electric vehicles benefit from Hawaii’s Clean Energy and Fuel Goals. The Hawaii Clean Energy Initiative (HCEI), a partnership between the State of Hawaii and the U.S. Department of Energy, seeks to reduce Hawaii’s dependence on imported fossil fuels by achieving a goal of 70 percent clean energy by the year 2030. The full report may be viewed at:

http://www.mauieva.org/docs/EVparadise.pdf

Their report also outlines how Hawaii is the most oil-dependent state in the United States.


Hawaii is the most oil-dependent state in the United States, with more than 95% of its energy demand coming from imported fossil fuels, resulting in the highest gasoline and electricity prices in America. Furthermore, Hawaii’s dependence on petroleum, as its single source of energy, makes its economy security vulnerable to changes in world petroleum market. Hawaii sends billions of dollars overseas and out of its local economy to support its petroleum needs. As a strategy to relieve Hawaii’s dependence on oil, the state has set a goal of achieving 70% clean energy by 2030, and undertaking that will require transforming how its energy is produced and consumed. To reduce consumption of petroleum within the transportation sector, Hawaii is looking at plug in electric vehicles (EV) as well as other alternative transportation solutions to
address the challenges of modernizing its energy system and building a clean transportation future.

Maui EVA reports on the status of electric vehicle deployment in Hawaii and benefits from the Hawaii Clean Energy Initiative. See full report at: http://www.mauieva.org/docs/EVparadise.pdf
Navigant Research also reported that Hawaii will be the nation’s leader by 2020, with 10% of all vehicles sold to be Plug-in EVs. See the full report at:
http://www.navigantresearch.com/blog/hawaii-becoming-an-ev-paradise

Hawaii Becoming an EV Paradise

John Gartner — September 25, 2013

Sales of electric vehicles (EVs) in California are by far the highest in the United States, but the state with the greatest density of EVs sold is further west. According to Navigant Research’s recently released report Electric Vehicle Geographic Forecasts, by 2022, 10% of all new vehicle sales in Hawaii will be plug-in electric vehicles (PEVs). Most of the top states that will be selling EVs in 2022 (see the chart below) are known for being progressive, environmentally friendly, and tech savvy states, such as Oregon, Washington, and Vermont. West Virginia, which is one of the top consumers of coal in the country, is an anomaly, thanks to a generous $3,500 state incentive for buying a PEV. This illustrates the effectiveness of financial incentives in moving drivers from gas to electricity—even if that electricity may not come from a renewable resource.

**PEV Sales as a Percentage of Light Duty Vehicle Sales, Top 25 States: 2022**

(Source: Navigant Research)
Industry Needs
As Hawaii follows the national trends and soon become the leader in sales of Electric Vehicles, repairs on these vehicles also will be in demand. Statistics by the Hawaii Workforce Infonet shows the long term employment projections for Automotive Service Technicians and Mechanics in Hawaii listed on table below. See: https://www.hiwi.org/vosnet/lmi/occ/occsummary.aspx?session=occdetail_lms&geo=150100000&geotype=&city=&zip=&radius=&onetcode=49302300

<table>
<thead>
<tr>
<th>Occupation</th>
<th>2010 Estimated Employment</th>
<th>2020 Estimated Employment</th>
<th>Net Growth</th>
<th>Percent Growth</th>
<th>Annual Average Openings Due To Growth</th>
<th>Annual Average Openings Due To Replacement</th>
<th>Total Annual Average Openings</th>
</tr>
</thead>
<tbody>
<tr>
<td>Automotive Service Technicians and Mechanics</td>
<td>2,740</td>
<td>3,040</td>
<td>300</td>
<td>10.8%</td>
<td>30</td>
<td>70</td>
<td>100</td>
</tr>
</tbody>
</table>

Occupations related to Automotive Specialty Technicians and electric vehicle repairs. http://www.onetonline.org/find/quick?s=automotive+specialty+technicains

<table>
<thead>
<tr>
<th>CODE</th>
<th>OCCUPATION</th>
</tr>
</thead>
<tbody>
<tr>
<td>49-3023.00</td>
<td>Automotive Service Technicians and Mechanics</td>
</tr>
<tr>
<td>49-3023.01</td>
<td>Automotive Master Mechanics</td>
</tr>
<tr>
<td>49-3023.02</td>
<td>Automotive Specialty Technicians</td>
</tr>
<tr>
<td>49-9098.00</td>
<td>Helpers--Installation, Maintenance, and Repair Workers</td>
</tr>
<tr>
<td>49-3031.00</td>
<td>Bus and Truck Mechanics and Diesel Engine Specialists</td>
</tr>
<tr>
<td>17-3027.01</td>
<td>Automotive Engineering Technicians</td>
</tr>
<tr>
<td>17-2141.02</td>
<td>Automotive Engineers</td>
</tr>
<tr>
<td>49-1011.00</td>
<td>First-Line Supervisors of Mechanics, Installers, and Repairers</td>
</tr>
<tr>
<td>49-9041.00</td>
<td>Industrial Machinery Mechanics</td>
</tr>
<tr>
<td>51-4041.00</td>
<td>Machinists</td>
</tr>
<tr>
<td>51-9198.00</td>
<td>Helpers--Production Workers</td>
</tr>
<tr>
<td>49-2092.00</td>
<td>Electric Motor, Power Tool, and Related Repairers</td>
</tr>
<tr>
<td>49-3093.00</td>
<td>Tire Repairers and Changers</td>
</tr>
<tr>
<td>49-3021.00</td>
<td>Automotive Body and Related Repairers</td>
</tr>
<tr>
<td>49-3022.00</td>
<td>Automotive Glass Installers and Repairers</td>
</tr>
<tr>
<td>53-6031.00</td>
<td>Automotive and Watercraft Service Attendants</td>
</tr>
</tbody>
</table>
The table below shows how many potential candidates in the workforce system were looking for work in Hawaii in occupations related to Automotive Specialty Technicians on March 17, 2015. [https://www.hiwi.org/vosnet/lmi/occ/occsummary](https://www.hiwi.org/vosnet/lmi/occ/occsummary)

<table>
<thead>
<tr>
<th>Rank</th>
<th>Occupation Title</th>
<th>2013 Estimated Median Annual Wage</th>
<th>Potential Candidates</th>
<th>*Related By</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Maintenance and Repair Workers, General</td>
<td>$41,510</td>
<td>306</td>
<td>O*NET</td>
</tr>
<tr>
<td>2</td>
<td>Aircraft Mechanics and Service Technicians</td>
<td>$69,310</td>
<td>94</td>
<td>O*NET</td>
</tr>
<tr>
<td>3</td>
<td>Automotive Service Technicians and Mechanics</td>
<td>$42,740</td>
<td>90</td>
<td>SOC4</td>
</tr>
<tr>
<td></td>
<td>Helpers--Installation, Maintenance, and Repair Workers</td>
<td></td>
<td></td>
<td>O*NET</td>
</tr>
<tr>
<td>4</td>
<td>Automotive Master Mechanics</td>
<td>$42,740</td>
<td>44</td>
<td>O*NET</td>
</tr>
<tr>
<td>5</td>
<td>Bus and Truck Mechanics and Diesel Engine Specialists</td>
<td>$61,160</td>
<td>41</td>
<td>O*NET</td>
</tr>
<tr>
<td>6</td>
<td>Automotive Specialty Technicians</td>
<td>$42,740</td>
<td>39</td>
<td>N/A</td>
</tr>
<tr>
<td>7</td>
<td>Heating and Air Conditioning Mechanics and Installers</td>
<td>$46,830</td>
<td>34</td>
<td>O*NET</td>
</tr>
<tr>
<td>8</td>
<td>Industrial Machinery Mechanics</td>
<td>$58,450</td>
<td>15</td>
<td>O*NET</td>
</tr>
<tr>
<td>9</td>
<td>Transportation Vehicle, Equipment and Systems Inspectors, Except Aviation</td>
<td>$63,270</td>
<td>8</td>
<td>O*NET</td>
</tr>
</tbody>
</table>

Wage Data Source: Labor Market Statistics, Occupational Employment Statistics & Wages Program
*Related By: O*NET™ - The Occupational Information Network. O*NET is a registered trademark of the US Department of Labor/Employment and Training Administration.
SOC4 - Occupational grouping based on 1st 4 digits of the Standard Occupational Classification system.

Candidate Source: Individuals with active resumes in the workforce system
III. How is the program organized to meet its objectives?
The purpose of the Certificate of Achievement in Automotive Green Technology is to address the needs of the automotive industry. To prepare students for entry-level positions in the automotive industry that deals with alternative energy, the Automotive Green Technology program will offer new courses in hybrid and electric vehicle technology. HEV I – Introduction to Hybrid and Electric Vehicle Technology, HEV II – Preventive Maintenance and Repair, and HEV III – Diagnostic and Repair along with specific courses in the existing Automotive Technology (AMT) Associate in Applied Science degree program to form the Certificate of Competence in HEV Preventive Maintenance and Repair, and a Certificate of Competence in HEV Diagnostic and Repair. These new courses and certificates will be the foundation for the Certificate of Achievement in Automotive Green Technology.

The existing Associate in Applied Science (AAS) degree in Automotive Technology has certificates that are separate from those proposed in the new Certificate of Achievement (CA) in Automotive Green Technology. New HEV courses along with specific AMT courses are clustered to form a new Certificate of Competence (CO) in HEV Preventive Maintenance and Repair, and a new Certificate of Competence (CO) in HEV Diagnostic and Repair. Completion of AMT 40E – Electrical I, AMT 30 – Engines, AMT 40H – Engine Performance II, and ETRO 18 – General Electronics are courses from the AAS degree incorporated with the HEV courses to make up these new certificates. AMT students that decide not to pursue these new certificates will not be required to complete them in order to achieve their AAS degree in Automotive Technology. Prospective students interested only in the advanced technology of electric vehicles will also be apprised of the different pathways and benefits to pursue the AAS degree.

Curriculum Plan

<table>
<thead>
<tr>
<th>AUTOMOTIVE GREEN TECHNOLOGY Certificate of Achievement</th>
<th>Course</th>
<th>Title</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>HEV Preventive Maintenance and Repair Certificate of Competence</td>
<td>AMT 30</td>
<td>Engine Repair</td>
<td>6</td>
</tr>
<tr>
<td></td>
<td>AMT 40E</td>
<td>Electrical/Electronics I</td>
<td>4</td>
</tr>
<tr>
<td></td>
<td>AMT 171</td>
<td>Intro to Hybrid and Electric Vehicle Technology</td>
<td>3</td>
</tr>
<tr>
<td></td>
<td>AMT 172</td>
<td>HEV Preventive Maintenance and Repair</td>
<td>3</td>
</tr>
<tr>
<td></td>
<td>ETRO 18</td>
<td>General Electronics</td>
<td>3</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Total</td>
<td>19</td>
</tr>
<tr>
<td>HEV Diagnostic and Repair Certificate of Competence</td>
<td>AMT 40E</td>
<td>Electrical/Electronics I</td>
<td>4</td>
</tr>
<tr>
<td></td>
<td>AMT 40H</td>
<td>Engine Performance II</td>
<td>5</td>
</tr>
<tr>
<td></td>
<td>AMT 171</td>
<td>Intro to Hybrid and Electric Vehicle Technology</td>
<td>3</td>
</tr>
<tr>
<td></td>
<td>AMT 173</td>
<td>HEV Diagnostic and Repair</td>
<td>3</td>
</tr>
<tr>
<td></td>
<td>ETRO 18</td>
<td>General Electronics</td>
<td>3</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Total</td>
<td>18</td>
</tr>
<tr>
<td>Certificate of Achievement</td>
<td>AMT 30</td>
<td>Engine Repair</td>
<td>6</td>
</tr>
<tr>
<td></td>
<td>AMT 40E</td>
<td>Electrical/Electronics I</td>
<td>4</td>
</tr>
</tbody>
</table>
Proposed CA in Automotive Green Technology

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Name</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>AMT 40H</td>
<td>Engine Performance II</td>
<td>5</td>
</tr>
<tr>
<td>AMT 171</td>
<td>Intro to Hybrid and Electric Vehicle Technology</td>
<td>3</td>
</tr>
<tr>
<td>AMT 172</td>
<td>HEV Preventive Maintenance and Repair</td>
<td>3</td>
</tr>
<tr>
<td>AMT 173</td>
<td>HEV Diagnostic and Repair</td>
<td>3</td>
</tr>
<tr>
<td>ETRO 18</td>
<td>General Electronics</td>
<td>3</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td></td>
<td><strong>27</strong></td>
</tr>
</tbody>
</table>

Proposed Automotive Green Technology program pathways

Students that pursue training in advanced hybrid and electric vehicle technology have three different options to choose. Option 1 is an opportunity to earn an AAS degree in Automotive Technology, two CAs, and six COs within three years. Option 2 is an opportunity to earn a CA in Automotive Green Technology, and six COs within two years. Option 3 is an opportunity to earn a CO in HEV Preventive Maintenance and Repair in one year. These estimates are dependent on the credits completed each semester and certificates may be earned sooner. All AMT courses are sequential each semester, but individuals with industry work experience may take these courses out of sequence or may also apply for Prior Learning Assessment (PLA) credits to earn the CA in Automotive Green Technology within one year.

IV. Who will enroll in the program?

The program will enhance the existing Automotive Technology program by providing training in “Sustainable Green Technology”. Specialized training in hybrid and electric vehicle maintenance and repair is required to meet industry needs as vehicle manufacturers comply with the goal to produce electric vehicles and address the fuel-economy and carbon-pollution standards. As with any vehicle, electric vehicles need to be occasionally maintained and repaired. Much of the routine maintenance and repair work can be done by normal auto repair workers, but the electrical systems and drive train will need skilled workers familiar with electric vehicles. The U.S. Bureau of Labor Statistics describes the green jobs and careers in Electric Vehicles. [http://www.bls.gov/green/electric_vehicles/electric_vehicles.pdf](http://www.bls.gov/green/electric_vehicles/electric_vehicles.pdf)

a. Target groups

The Automotive Green Technology program is designed to target advanced automotive students, part-time and working students, and students who test into or take remedial/developmental courses.

Students that complete the two year Automotive Technology program will have gained the essentials necessary to progress into the new technology of high voltage vehicles and will be the primary target. The program is also designed to accommodate part-time students looking for specialized training on high voltage systems. Each automotive course is modular being 5-7 weeks long to accommodate both full-time and part-time working students. The modular courses allow students to complete their necessary classes for short periods at a time while still being able to work full or part-time. Students already working in the automotive industry looking to enhance their knowledge and experience with this new technology would be able to take classes during the mornings, afternoons, or possibly in the evenings around their work schedule.
Another target group is the traditional students who are under 25 years old and have been enrolled at the college for two or more years without graduating with the AAS degree. A large portion of the students enrolled at Kauai CC approximately 90% of the student body test into at least one remedial/developmental subject. These students often struggle to meet the rigor required for the prerequisites for the associate level degrees, especially in automotive. The new CA in Automotive Green Technology will give these students another opportunity to achieve an academic goal with a certificate that lead to gainful employment.

b. **Advisory Committee Approval**

Our Automotive Technology program has an Advisory Committee comprised of local automotive dealership service managers, dealership shop foremen, fleet repair service managers, independent repair shop managers, high school automotive instructors, and graduates of our program. Semi-annual meetings are held to provide guidance, feedback and evaluation of the program that is required by NATEF in order to remain compliant with national industry standards. Committee members are apprised on how we prepare students for employment as they provide valuable feedback while evaluating the program on our curriculum, equipment, and facilities. With the guidance and feedback of the latest trends and technological advancements in automobiles from these meetings, the program identified the need to train students on hybrid and electric vehicles. They fully supported our efforts on the direction we are taking to prepare students for this new technology, the development of the new program and recommended that we solicit the need from our local repair facilities. A database listing of all repair facilities was created in order to solicit feedback on the need for this new training. The database was then forwarded to our Workforce/Internship Coordinator who distributed fliers of the program with these businesses and received positive feedback and interest of hiring our students in the future.

c. **Marketing**

Several outreach activities were presented to the community to showcase our new program. Chancellor Cox scheduled community forums to speak at each of the neighborhood centers on the island to bring awareness on the Strategic Plan of the campus that included Sustainability with new programs as we presented our Automotive Green Technology. Middle and High school career fairs were also scheduled as students, counselors, and faculty were apprised on the training with this new technology that we provide. The program received state-wide exposure as the University of Hawaii marketing team developed a UH video on sustainability and technology with our program that was presented on our UH news and currently running on local television media.

http://www.hawaii.edu/news/2014/03/05/kauai-cc-preparing-auto-mechanics-for-green-future/

V. **What resources are required for program implementation and first cycle of operation?**

A revenue and cost analysis is provided with projections for the first two academic years, fall 2015 through spring 2017.
Cost and Revenue Narrative
Initial start-up funds were provided by the Trade Adjustment Act Community College Career and Training (TAACCCT) grant round 2 also known as (C3T2) to renovate a machine shop facility along with covering the salary of one FTE faculty for this new Automotive Green Technology training program. New specialized training and diagnostic equipment, a 2012 Toyota Prius Plug-in Hybrid from this grant, and a 2013 Nissan Leaf acquired in the C3T1 grant were funded. Other training aids, diagnostic equipment, basic shop tools and supplies along with a 2011 Toyota Prius Hybrid were acquired through Perkins grants. Outreach and partnership with dealerships, research and development corporations, and private donors have led to donations and support enabling the training program to offer its first courses in Fall 2013. Kia Motors America donated a 2011 Kia Optima Hybrid along with a 2012 Kia Sportage SUV and will continue to support the program with additional donations of other vehicles in the future. Tank Automotive Research, Development and Engineering Center donated a 2006 Ford Escape EV as part of an educational partnership with Kauai CC. Servco Pacific Kauai Toyota donated high voltage battery packs, electronic power inverters, and controllers for training aids. Private donors provided our program with a 2010 GEM eLXD Electric vehicle, a 2006 Toyota Prius Hybrid, 2006 Toyota Highlander Hybrid, 2001 Toyota Prius Hybrid, 2001 Honda Insight Hybrid, a 1971 Alfa Romero along with $30,000 for restoration, conversion to an Electric vehicle and program support, and another donor provided $2,000 towards our program.

Enrollment (A) and Annual SSH (B): For safety reasons, the maximum class size is set at 14 for each class with the anticipated enrollment estimated at 12 students the first year and 14 students in the following year. The annual SSH is calculated for the first year with 12 students at 27 credits in the program having a total of 324 SSH and 14 students at 27 credits in the second year that equates to 378 Annual SSH.

Instructional Cost Without Fringe (C):Existing FTE faculty and part-time lectures in the Automotive and Electronics programs will be utilized to teach all required courses in this program as no new positions will be needed. The proposed CA in Automotive Green Technology include a total of seven courses at 27 credits with four of its courses already being taught as a requirement for the existing AMT AAS degree. One FTE faculty is scheduled to teach 6 credits at 8.75 Teaching Equivalency (TE) that equates to 32% of his 27 TE workload for the two new courses in the program while a lecturer teaches the third new course at 3 credits in the 1st year. Scheduling for the 2nd year will have the FTE faculty teach one course with 3 credits at 4.375 TE and 16% of his teaching load with the lecturer scheduled to teach two courses at 6 credits.

The number of full time faculty who are above .5 FTE listed in C1 is 0. The number of part time lecturers who are below .5 FTE listed in C2 is 1.

Other Personnel Cost (D): None
**Unique Program Cost (E):** The estimated cost to properly run the program with an annual operating budget for daily consumable supplies, shop maintenance items, tools and equipment replacement, subscriptions for diagnostic equipment, vehicle components/training aids, contracted services, and classroom/office supplies is approximately $5,000. This cost is included in the Annual Program Review Update (APRU) request for operating budget that is presented to the campus college council and has been approved. Any additional funds needed for new equipment or training aids will be requested through Perkins grant proposals.

**Total Direct and Incremental Cost (F):** Current FTE faculty being utilized are already teaching existing AMT 30 and AMT 40H courses with existing lecturers teaching AMT 40E and ETRO 18 courses which are required for the Automotive AAS degree. One FTE faculty will teach the new AMT 171 and AMT 172 courses and a lecturer will the new AMT 173 course in the 1st year. Scheduling for the 2nd year will have the FTE faculty teach AMT 171, and the lecturer will teach AMT 172 and AMT 173. Tuition revenue generated will cover the cost for these new courses.

**Revenue Tuition (G) and Other (H):** Proposed rates per credit hour were extracted from the 2015-2016 and 2016-2017 Tuition Schedule for UHCCs and multiplied by the annual SSH per academic year to arrive at the projected annual revenues. Other revenue is provided by the C3T2 grant funding for 1 FTE position for 2015-2016 academic year.

**Instructional Cost with Fringe (K1) and (K3):** Salary amounts are based on salary of FTE faculty multiplied by the percentage of FTE workload along with the credit load taught by the lecturer.

There are no other Automotive Green Technology programs in the UHCC system. Therefore Hawaii CC’s Automotive Technology AAS program was used for **Comparable Cost/SSH (O).**
# Academic Cost and Revenue Template - New Program

(adjust template for appropriate number of years)

## CAMPUS/Program

<table>
<thead>
<tr>
<th>Provisional Years (2 yrs for Certificate, 3 yrs for Associate Degree, 6 yrs for Bachelor's Degree, 3 yrs for Masters Degree, 5 yrs for Doctoral Degree)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Kauai CC/ Automotive Green Technology</td>
</tr>
</tbody>
</table>

## ENTER ACADEMIC YEAR (i.e., 2011-2012)

<table>
<thead>
<tr>
<th>Year 1</th>
<th>Year 2</th>
<th>Year 3</th>
</tr>
</thead>
<tbody>
<tr>
<td>2015-2016</td>
<td>2016-2017</td>
<td></td>
</tr>
</tbody>
</table>

## Students & SSH

<table>
<thead>
<tr>
<th></th>
<th>Year 1</th>
<th>Year 2</th>
</tr>
</thead>
<tbody>
<tr>
<td>A. Headcount enrollment (Fall)</td>
<td>12</td>
<td>14</td>
</tr>
<tr>
<td>B. Annual SSH</td>
<td>324</td>
<td>378</td>
</tr>
</tbody>
</table>

## Direct and Incremental Program Costs Without Fringe

<table>
<thead>
<tr>
<th></th>
<th>Year 1</th>
<th>Year 2</th>
</tr>
</thead>
<tbody>
<tr>
<td>C. Instructional Cost without Fringe</td>
<td>$33,276</td>
<td>$23,991</td>
</tr>
<tr>
<td>C1. Number (FTE) of FT Faculty/Lecturers</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>C2. Number (FTE) of PT Lecturers</td>
<td>1.00</td>
<td>1.00</td>
</tr>
<tr>
<td>D. Other Personnel Costs</td>
<td>$</td>
<td>$</td>
</tr>
<tr>
<td>E. Unique Program Costs</td>
<td>$5,000</td>
<td>$5,000</td>
</tr>
<tr>
<td>F. Total Direct and Incremental Costs</td>
<td>$38,276</td>
<td>$28,991</td>
</tr>
</tbody>
</table>

## Revenue

<table>
<thead>
<tr>
<th></th>
<th>Year 1</th>
<th>Year 2</th>
</tr>
</thead>
<tbody>
<tr>
<td>G. Tuition</td>
<td>$39,528</td>
<td>$49,140</td>
</tr>
<tr>
<td>Tuition rate per credit</td>
<td>$122</td>
<td>$130</td>
</tr>
<tr>
<td>H. Other</td>
<td>$46,968</td>
<td>$</td>
</tr>
<tr>
<td>I. Total Revenue</td>
<td>$86,496</td>
<td>$49,140</td>
</tr>
</tbody>
</table>

## J. Net Cost (Revenue)

<table>
<thead>
<tr>
<th></th>
<th>Year 1</th>
<th>Year 2</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>($48,220)</td>
<td>($20,149)</td>
</tr>
</tbody>
</table>

## Program Cost per SSH With Fringe

<table>
<thead>
<tr>
<th></th>
<th>Year 1</th>
<th>Year 2</th>
</tr>
</thead>
<tbody>
<tr>
<td>K. Instructional Cost with Fringe/SSH</td>
<td>$135</td>
<td>$79</td>
</tr>
<tr>
<td>K1. Total Salary FT Faculty/Lecturers</td>
<td>$28,989</td>
<td>$15,075</td>
</tr>
<tr>
<td>K2. Cost Including Fringe of K1</td>
<td>$39,135</td>
<td>$20,351</td>
</tr>
<tr>
<td>K3. Total Salary PT Lecturers</td>
<td>$4,287</td>
<td>$8,916</td>
</tr>
<tr>
<td>K4. Cost Including fringe of K3</td>
<td>$4,501</td>
<td>$9,362</td>
</tr>
<tr>
<td>L. Support Cost/SSH</td>
<td>$387</td>
<td>$387</td>
</tr>
<tr>
<td>Non-Instructional Exp/SSH</td>
<td>$328</td>
<td>$328</td>
</tr>
<tr>
<td>System-wide Support/SSH</td>
<td>$59</td>
<td>$59</td>
</tr>
<tr>
<td>Organized Research/SSH</td>
<td>$</td>
<td>$</td>
</tr>
<tr>
<td>M. Total Program Cost/SSH</td>
<td>$522</td>
<td>$466</td>
</tr>
<tr>
<td>N. Total Campus Expenditure/SSH</td>
<td>$703</td>
<td>$703</td>
</tr>
</tbody>
</table>

## Instruction Cost with Fringe per SSH

<table>
<thead>
<tr>
<th></th>
<th>Year 1</th>
<th>Year 2</th>
</tr>
</thead>
<tbody>
<tr>
<td>K. Instructional Cost/SSH</td>
<td>$135</td>
<td>$79</td>
</tr>
<tr>
<td>O. Comparable Cost/SSH</td>
<td>$245</td>
<td>$281</td>
</tr>
</tbody>
</table>

Program used for comparison:
Leeward Community College

Reviewed by campus Vice Chancellor for Administrative Services

Signature and date: [Signature]  [Date]
VI. How efficient will the program be?
The proposed CA in Automotive Green Technology will utilize existing faculty, staff, facilities, and equipment. A student that earns this certificate of achievement will have the opportunity to seek employment in various sectors of the automotive industry, such as in engine repair, vehicle drivability diagnostics, electrical repair, high voltage vehicle maintenance and repair, and high voltage systems diagnostics. Moreover, as all leading vehicle manufacturers across the globe move towards alternative energy and electric vehicles, training will be needed for technicians to repair these vehicles. The State of Hawaii occupational projections indicate a 17% increase in the number of workers needed who are trained in Automotive EV/PHEV electronic systems and vehicle repair on the island of Kauai by the year 2018. As vehicle warranty expires, more repair facilities will be working on these vehicles creating a demand for training that will allow the program to become economically sustainable.

The program will track student success with their academic achievement in the number of students graduated with COs, CAs, and students that continued on to complete their AAS in Automotive Technology. Tracking of licensure and job placement in specific areas aligned with the Standard Occupational Classification (SOC) codes will also be documented and utilized as additional data along with the Annual Report of Program Data (ARPD) on measures of efficiency.

VII. How will effectiveness of the program be demonstrated?
Program effectiveness is determined by looking at student achievement data. The ARPD is utilized to identify student achievement in areas that includes Successful Completion (C or Higher), Persistence Fall to Spring, Unduplicated Degrees/Certificates Awarded, and Perkins Core Indicators. Technical Skills Attainment, Completion, Student Retention, Student Placement, Nontraditional Participation and Nontraditional Completion will be specifically tracked within the Perkins Core Indicators to measure student achievement. Collection of data on students that earned COs and a CA, continued their education to earn an AAS degree, passed industry certification exams, received licensure in a related field, and gainful employment in a related field will also be utilized to demonstrate the effectiveness of the program. The analysis of this data will be reported in the Annual Program Review Update (APRU).

Each course is assessed utilizing the Course Assessment Recording Data (CARD) to identify whether or not students met benchmarks set on Course Student Learning Outcomes (CSLO). Analysis of this data is used to determine if modifications are necessary to the curriculum or method of instruction. The CSLOs are in alignment with the Program Learning Outcomes (PSLO) which is also assessed similarly to the CARD.

The Automotive program has an industry advisory board that meets twice a year to review program curriculum, facility, equipment, and effectiveness of overall program operation. They
provide feedback on new industry trends, and areas that need improvement in order to maintain industry standards to prepare our students for the workforce. All courses are competency based with this new program under the Automotive Technology NATEF umbrella. Standards set by NATEF require the program to perform a 2 ½ year Midpoint review along with a comprehensive 5-year recertification review. By complying with and following NATEF standards in order to maintain certification, the program ensures that students who successfully demonstrated their ability to meet all Program Learning Outcomes will be competent as entry-level technician in the areas they received training on.

VIII. References


Center for Climate and Energy Solutions Federal Vehicle Standards http://www.c2es.org/federal/executive/vehicle-standards


US Department of Energy Alternative Fuels Data Center http://www.afdc.energy.gov/fuels/electricity.html


Hawaii Workforce Infonet Long Term Employment Projections for Automotive Technicians https://www.hiwi.org

O Net Online Report for 49-3023.02 Automotive Specialty Technicians http://www.onetonline.org/find/quick?s=automotive+specialty+technicians

Maui Electric Vehicle Alliance Research Findings and Report http://maui.hawaii.edu/eva/home/

Navigant Research Hawaii Becoming an EV Paradise http://www.navigantresearch.com/blog/hawaii-becoming-an-ev-paradise
http://www.hawaii.edu/news/2014/03/05/kauai-cc-preparing-auto-mechanics-for-green-future/
Appendix A

Automotive Green Technology New CO, CA Proposed Curriculum

<table>
<thead>
<tr>
<th>Suggested Courses Sequence</th>
<th>HEV Preventive Maintenance and Repair</th>
<th>HEV Diagnostic and Repair</th>
<th>Automotive Green Technology</th>
</tr>
</thead>
<tbody>
<tr>
<td>First Semester (Fall)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>AMT 40E Electrical/Electronics I</td>
<td>4</td>
<td>4</td>
<td>4</td>
</tr>
<tr>
<td>ETRO 18 General Electronics</td>
<td>3</td>
<td>3</td>
<td>3</td>
</tr>
<tr>
<td>Second Semester (Spring)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>AMT 30 Engines</td>
<td>6</td>
<td></td>
<td>6</td>
</tr>
<tr>
<td>Third Semester (Fall)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>AMT 171 Introduction to Hybrid and Electric Vehicle Technology</td>
<td>3</td>
<td>3</td>
<td>3</td>
</tr>
<tr>
<td>Fourth Semester (Spring)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>AMT 172 HEV Preventive Maintenance and Repair</td>
<td>3</td>
<td>3</td>
<td>3</td>
</tr>
<tr>
<td>AMT 40H Engine Performance II</td>
<td>5</td>
<td></td>
<td>5</td>
</tr>
<tr>
<td>AMT 173 HEV Diagnostic and Repair</td>
<td>3</td>
<td></td>
<td>3</td>
</tr>
<tr>
<td>TOTAL CREDITS</td>
<td>19</td>
<td>18</td>
<td>27</td>
</tr>
</tbody>
</table>

Course Description

AMT 30 – Engines
Credits: 6
Class hours: 3 lecture and 9 lab Total: 180 contact hrs.
This course will cover shop safety, tools, and all components found in the modern internal combustion engine. The course is designed to provide students with an understanding of the fundamental operation and construction of internal combustion engines. Instruction will include theory and laboratory (shop) activities in which students will learn how to inspect, service, maintain, diagnose, and repair automobile engine malfunctions. This course includes live work.

AMT 40E – Electrical/Electronics I
Credits: 4
Class hours: 2 lecture and 6 lab Total: 120 contact hrs.
This course will provide students with fundamental principles of automotive electricity and electronics. Practical skills to diagnose, test, and service battery, starting, charging, and lighting systems are covered. Testing and repair of electrical safety devices, wiring, connectors, and relays are also covered.

**AMT 40H – Engine Performance II**
*Credit: 5*
*Class hours: 2 lecture and 9 lab Total: 165 contact hrs.*
Computer engine management systems of domestic and foreign cars are studied in this course. Covers theory of operation, diagnosis and repair of sensors, actuators, and on-board computers. Use of scanners, digital storage oscilloscopes, digital graphing multi-meters, and DVOMs are covered.

**AMT 171 – Introduction to Hybrid and Electric Vehicle Technology**
*Credits: 3*
*Class hours: 1 lecture and 6 lab Total: 105 contact hrs.*
This course is designed to familiarize the student with the safety, electrical and electronic theories related to hybrid and electric vehicles, high voltage analysis tools used in hybrid and electric vehicles, high voltage safety systems, AC induction machines, and permanent magnet electric motors theory and construction. Hands-on application to safety disconnect and use of high voltage analysis tools to perform basic checks.

**AMT 172 – HEV Preventive Maintenance and Repair**
*Credits: 3*
*Class hours: 1 lecture and 6 lab Total: 105 contact hrs.*
This course is designed to familiarize the student with hybrid and electric vehicle safety, hybrid internal combustion engines (ICE), regenerative braking systems, high voltage climate control system, power inverter and battery pack cooling systems, high voltage analysis tools used, high voltage safety systems, and 12 volt systems used in hybrid and electric vehicles. Hands-on application to safety disconnect, use of high voltage analysis tools to perform basic checks, and perform service and preventive maintenance on hybrid and electric vehicles.

**AMT 173 – HEV Diagnostic and Repair**
*Credits: 3*
*Class hours: 1 lecture and 6 lab Total: 105 contact hrs.*
This course is designed to familiarize the student with hybrid and electric vehicle safety, hybrid internal combustion engines (ICE), hybrid transmissions, parallel/series, power inverter systems, AC induction machines, permanent magnet electric motors theory and construction, and battery pack construction. Hands-on application to safety disconnect, use of high voltage analysis tools to perform diagnostic tests on high voltage insulation failures, electric motor failures, battery failures, and differentiate between an ICE failure and an electric machine failure. Perform battery pack testing and reconditioning.

**ETRO 18 – General Electronics**
*Credits: 3*
*Class hours: 3 lecture Total: 45 contact hrs.*
This introduction to DC, AC, semi-conductor, and digital electronics includes characteristics, applications, power supplies, and amplifiers. The course includes use of oscilloscopes and meters.
1. **Type of Program Action:**
   - X New
   - [ ] Modification
   - [ ] Deletion

<table>
<thead>
<tr>
<th>PRESENT</th>
<th>CO Program Title</th>
<th>CC Program Title</th>
<th>CA Program Title</th>
<th>AAS Program Title</th>
<th>PROPOSED</th>
<th>HEV Preventive Maintenance and Repair</th>
<th>HEV Diagnostic and Repair</th>
<th>Automotive Green Technology Certificate</th>
</tr>
</thead>
<tbody>
<tr>
<td>NONE</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>CO</td>
<td>CO</td>
<td>CA</td>
</tr>
<tr>
<td></td>
<td>AMT 40E</td>
<td>4</td>
<td>4</td>
<td>4</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>ETRO 18</td>
<td>3</td>
<td>3</td>
<td>3</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>AMT 30</td>
<td>6</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>AMT 40H</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>5</td>
<td>5</td>
<td></td>
</tr>
<tr>
<td></td>
<td>AMT 171</td>
<td>3</td>
<td>3</td>
<td>3</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>AMT 172</td>
<td>3</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>AMT 173</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>3</td>
<td>3</td>
<td></td>
</tr>
<tr>
<td></td>
<td>TOTALS</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>19</td>
<td>18</td>
<td>27</td>
</tr>
</tbody>
</table>

2. **Program Type:**
   - [ ] Associate in Applied Science (AAS)
   - [ ] Certificate of Completion (CC)
   - [X] Associate in Arts (AA)
   - [ ] X Certificate of Competence (CO)
   - [ ] Associate in Science (AS)
   - [ ] Certificate of Achievement (CA)
   - [ ] Academic Subject Certificate (ASC)

3. **Program Title:** Automotive Green Technology

4. **Program Description (for catalog):**

   The Automotive Green Technology program is a competency-based program designed following standards specified by the National Automotive Education Foundation (NATEF). In order to meet global changes, the automotive industry has gone Green with Hybrid and Electric vehicles. The program offers training in sustainable energy with Hybrid and Electric Vehicle (HEV) Technology to meet the industry needs. This program will prepare participants for an entry-level position in the automotive mechanics industry by introducing the basic knowledge and understanding needed for maintenance and repair of HEVs along with safety handling procedures while working on high voltage electrical systems.

   The Automotive Green Technology program courses are clustered into certificates, each providing a set of marketable workplace skills. The Certificates of Competence in HEV Preventive Maintenance and Repair, and the HEV Diagnostic and Repair will lead to a Certificate of Achievement in Automotive Green Technology.

   The goals of the program are to prepare the student with the skills and competencies necessary for a successful career as an automotive technician, to instill in the student the work habits and attitude necessary to work in a highly competitive field, and to provide the student with the basic skills necessary to become a lifelong learner in order to keep abreast of the latest technological changes in the automobile.
Program Admission Requirements:

Applicants will be admitted into the Automotive Green Technology program on a “first applied, first qualified” basis. Students not meeting prerequisites may take non-automotive designated courses required in the program and begin the cycle of automotive courses once prerequisites are met. First-semester courses require placement into ENG 21 and MATH 50. Student must maintain a valid driver’s license throughout the course of study.

Graduation Requirements:

A GPA of 2.0 or higher for all courses applicable towards the certificates is needed to meet graduation requirements.

5. Program Student Learning Outcomes:

1. Demonstrate technical proficiency in entry-level skills for employment in the automotive service field or related areas.
2. Apply the theory behind automotive procedures and use critical thinking when performing service, maintenance, diagnostics, and repair of all major automotive systems.
3. Comply with personal and environmental safety practices in accordance with applicable safety and environmental regulations.
4. Identify and use appropriate tools, testing and measuring equipment required to accomplish each task established by National Automotive Technology Education Foundation (NATEF).
5. Locate references, training information and manufacturer’s procedures from industry resources using the appropriate technology and will be able to perform tasks in accordance with their research.
6. Perform all diagnostic and repair tasks in accordance with manufacturer’s recommended procedures as published.
7. Communicate effectively both orally and in writing.

6. Proposed Date of First Offering: Fall 2015
AMT 199V taught in Fall 2013 accepted as credit for approved AMT 171. AMT 172 taught in Spring 2014 with new cycle of AMT 171, AMT 172, and AMT 173 taught in Fall 2014/Spring 2015.

7. Is this program offered at another UH campus? ☐ Yes ☒ No
If Yes, specify campus. If No, why is this program offered at KCC:

KCC will be the first to offer these new Hybrid/Electric Vehicle credit courses and program certificates.

8. Reason for this Program Action:
Create new CA in Automotive Green Technology to include three new HEV courses, AMT 171, 172, and 173 along with existing AMT 30, 40E, 40H, and ETRO 18 courses for the CO in HEV Preventive Maintenance and Repair, and the CO in HEV Diagnostic and Repair. This new CA will not be required for the AAS degree in Automotive Technology and will be an elective stand alone program.

An Authorization to Plan (ATP) was approved to create this new CA for Automotive Green Technology and a proposal for this new program will be presented to the BOR for approval.
April 22, 2015

Randolph G. Moore, Chair
University of Hawaii Board of Regents
2444 Dole St. Bachman Hall Rm 209
Honolulu, HI 96822

Honorable Chair Moore and Members of the UH Board of Regents:

RE: Kauai Community College Automotive Green Technology Program

As the State Representative for House District 14, East and North Kaua’i, I respectfully ask for your support for the Kauai Community College Automotive Green Technology program and its proposal to enhance the curriculum with specialized training to address emerging new technology in hybrid and electric vehicle maintenance and repair. As Kauai Community College is an educational cornerstone for our residents and a critical pathway to ensure a resilient workforce in our island economy; the Certificate of Achievement as proposed will offer students another opportunity to achieve an academic goal and further employment opportunities.

As the Chair of the Committee on Economic Development and Business, I want to acknowledge Kauai Community College and its progressive thinking to design the modular courses for short periods at a time while allowing students to continue to work full or part-time. In addition, students already working in the automotive industry looking to enhance their knowledge and experience with this new technology would be offered classes around their work schedule. This is very encouraging to continually integrate academic, career and technical instruction to address emerging industries.

I am pleased to offer my support to the Kauai Community College Automotive Green Technology Program and optimistic that the program as outlined will result in skilled and competent workers. With the State of Hawaii clean energy initiatives to reduce our dependence on fossil fuels and the increase sales of electric vehicles; repairs and maintenance on these vehicles will be in huge demand.

Thank you for your time and consideration.

Sincerely,

Representative Derek S.K. Kawakami

Cc: Helen Cox, Chancellor
Kauai Community College
May 5, 2015

Representative Derek Kawakami  
House of Representatives  
State Capitol Building, Room 314  
Honolulu, HI 96813

Dear Representative Kawakami:

Thank you for your letter of April 22, 2015 regarding the Kaua'i Community College Automotive Green Technology Program. We appreciate your support for the University and the vested interest you have in enhancing this particular curriculum at Kaua'i Community College. One of the goals of the University’s strategic directions is a continued commitment to improving the social, economic, and environmental well-being of current and future generations.

At such time that enhancements to this program come to the Regents for approval, I am sure it will receive our thoughtful consideration.

The role of the Board of Regents is of governance and policy, exercised through the university’s executive officer President Lassner. Operations of the campuses and all those that fall under it are the responsibility of each campus’s Chancellor.

We value support from all sources in our community, and will be sure to forward your message to Chancellor Cox at Kaua'i Community College.

Sincerely,

Randolph G. Moore

Copies: Helen Cox, Kaua'i Community College Chancellor  
John Morton, Vice President for Community Colleges  
Members, Board of Regents
May 5, 2015

Mr. Daryl L. Gerardo  
University of Hawaii  
Kauai Community college  
Automotive Mechanics Technology  
3-1901 Kaumualii Highway  
Lihue, Hi 96766

Subject: Automotive Green Technology Program

Aloha Daryl,

As a former Regent of the University of Hawaii, I am pleased to provide this letter of support for what I consider the wave of the future with regard to technology involving hybrid and electric vehicles. Not only the philosophy but the actual creation of such vehicles, which are not dependent on fuel to operate is here. With these innovations in vehicular design and operation, it is truly a no brainer that a program like the Automotive Green Technology be fully funded and supported at the Kauai Community College.

I have seen first hand, while on a Regents campus visit about a year ago, what the students in the program learn. It is IMPRESSIVE, especially when considering the infantile stages of the program and the limited equipment the instructors have to work with.

With innovation in these hybrid and electric vehicles your instructors need the tools and training to keep up with the technology.

Please continue your efforts in promoting this wonderful opportunity for your students. Aloha.

[Signature]

Tom H. Shigemoto  
Vice President
April 23, 2015

Dr. James Dire, Vice Chancellor for Academic Affairs
Kaua‘i Community College
3-1901 Kaumuali‘i Highway
Lihue, HI 96766

University of Hawaii Board of Regents
2444 Dole St., Bachman Hall, Room 209
Honolulu, HI 96822

Dear Dr. Dire and UH Board of Regents:

I am writing to express my strong support for the Hybrid/Electric Vehicle Maintenance and Repair Certificate Program at Kaua‘i Community College.

As maintenance and damage manager for Avis Budget Group on Kaua‘i, I supervise six technicians who are highly qualified in their trade. These technicians will maintain hybrid/electric vehicles in addition to repairing basic automobiles. The availability of this type of program is timely as it will provide the kind of certification they need to effectively and safely repair these specialized automobiles. In the coming years, the inventory of hybrid/electric vehicles in the rental fleet will increase steadily with the growing popularity and affordability, and technicians must continually update their skills to stay current.

The quality and experience of Kaua‘i Community College graduates have a direct impact on Avis Budget Group. Over the past several years, I have hired graduates from the automotive program who are currently employed and are doing well. In fact, all of my technicians and I, myself, have graduated from this program, and the instructors continue to work with me to refer their graduates. As a former member of the Kaua‘i Community College Automotive Advisory Committee, I continue to be involved and provide feedback on curriculum development as it relates to current industry requirements.

In conclusion, I fully support the continued development and growth of the Hybrid/Electric Vehicle Maintenance and Repair program at Kaua‘i Community College. If I can be of further assistance, please contact me at 645-0326.

Sincerely,

Edwin M. Fujii
Maintenance and Damage Manager
Avis Budget Group

c: Gordon Talbo, Professor
   Kaua‘i Community College Automotive Program
May 14, 2015

Servco Pacific, Inc. dba Servco Auto Kauai
2990 Aukele Street
Lihue, HI 96766

Dear Chancellor Cox,

I am writing to express my strong support for the Automotive program at KCC to create the new Certificate of Achieve in Automotive Green Technology. As the service manager for Kauai Toyota, I oversee operations of the parts and service department and see firsthand the types of repairs that are performed on a daily basis both with warranty repairs along with specialty repairs on vehicles out of warranty. Our technicians maintain updated training annually as new vehicle production is introduced that include new technology and new diagnostic and repair procedures.

As a member of the Automotive Technology program Advisory Committee, I actively participate with their meetings to inform the instructors on the essentials that are required for their students to understand as they graduate in order to be prepared for the industry. As new vehicles are being produced, additional training is needed with new technology that includes hybrid and electric vehicles. The faculty welcomes suggestions and informs the committee members on changes being proposed for the program that includes this new certificate to address the latest trend to become green. Our repair facility along with other repair shops would definitely benefit having future employees better prepared with the training that KCC provides.

I fully support the direction that the Automotive program is heading toward with this new CA in Automotive Green Technology and preparing our future technicians.

Sincerely,

Ron Kimura
Parts and Service Manager
Servco Auto Kauai
(808) 564-1951
April 13, 2015

M. Kawamura Farm Enterprises Inc.
2824 Wehe Rd.
Lihue, HI 96766

Dear Board of Regents,

I would like to extend my strong support for Kauai Community College to offer the new CA in Automotive Green Technology. As an active member of the Automotive Technology program Advisory Committee, I am aware of the progress the program is at with its recent NATEF certification in keeping up with its national standards and its developments with updated curriculum, equipment and tools. As the program keep up with new technology and identified the need for training in electric vehicles, they informed the members of the advisory committee on their decision to start a new certificate program. Faculty is always open to feedback and suggestions on the latest trends and new technology in the industry as advisory members inform the program on the type of training needed.

Dealing directly with the farming and small engines industry, I have seen more and more of the electronics and electric motors being used on equipment such as electric carts, forklifts, mowers and trackers. Our industry along with the automotive industry is changing as electric motors start to replace gas and diesel engines so we need to be trained to keep up with the latest trends. As KCC train their students on Electric vehicles, the knowledge gained through their training could also be applied towards industrial and farming equipment that utilizes electric motors.

I agree on the direction that the automotive program is taking to train students with this new technology of Hybrid and Electric vehicles and I fully support them to create the CA in Automotive Green Technology.

Sincerely,

Edward Kawamura Jr.
Vice President
April 10, 2015

Dear Board of Regents,

My name is Gail Shigematsu, General Manager of Pacific Service & Development Corporation dba Napa Auto Parts. I am writing this letter of support for the automotive program to establish the new Certificate of Achievement in Automotive Green Technology. As a General Manager for the largest Automotive Parts distributor on Kauai, I have to keep on top of the latest market trends and recognize that the automotive industry is changing with more Hybrid and Electric vehicles are on the road today. With more of these vehicles on the road, there will be much more needed parts and trained individuals to replace these parts when the vehicle repair is needed. Hawaii always lags behind mainland trends and the alternative fuel vehicles are now here and we need to be ready.

I fully support the Automotive Technology program in preparing for this emerging technology to train our next generation of technicians in Hybrid and Electric Vehicle Technology to create the Automotive Green Technology Certificate of Achievement.

Thank you for your time. I hope to hear from you soon.

Sincerely,

Gail Shigematsu
General Manager