Office Use Only: PP#

Cover Sheet for In-State Institutions
New Program or Substantial Modification to Existing Program

Institution Submitting Proposal	Howard Community College

Each action below requires a separate proposal and cover sheet.

- (●) New Academic Program
- ( ) New Area of Concentration
- ( ) New Degree Level Approval
- ( ) New Stand-Alone Certificate
- ( ) Off Campus Program
- ( ) Substantial Change to a Degree Program
- ( ) Substantial Change to an Area of Concentration
- ( ) Substantial Change to a Certificate Program
- ( ) Cooperative Degree Program
- ( ) Offer Program at Regional Higher Education Center

Payment Submitted:	Payment Type:	Payment Amount:	Date Submitted:
(●) Yes ( ) No	( ) R*STARS # 0588616 (●) Check # 0588616	$850	8/15/23

Department Proposing Program	Workforce, Career, and Community Education	
Degree Level and Degree Type	Associate of Applied Science	
Title of Proposed Program	Automotive Technology	
Total Number of Credits	60	
Suggested Codes	HEGIS: 5306.01	CIP: 47.0604
Program Modality	(●) On-campus ( ) Distance Education (fully online) ( ) Both	
Program Resources	(●) Using Existing Resources ( ) Requiring New Resources	
Projected Implementation Date (must be 60 days from proposal submisison as per COMAR 13B.02.03.03)	(●) Fall ( ) Spring ( ) Summer	Year: 2026
Provide Link to Most Recent Academic Catalog	URL: https://howardcc.smartcatalogiq.com/en/2023-2024/catalog/	
Preferred Contact for this Proposal	Name: Minah Woo	
	Title: Vice President of Workforce, Innovation & Strategic Partnerships	
	Phone: (443) 518-4724	
	Email: mwoo@howardcc.edu	
President/Chief Executive	Type Name: Daria J. Willis, Ph.D.	
	Signature: [signature]	Date: 8/24/23
	Date of Approval/Endorsement by Governing Board:	

Revised 1/2021

HOWARD
COMMUNITY COLLEGE
You Can Get There From Here.

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Parkway
Columbia, MD 21044
443-518-1000
www.howardcc.edu

August 17, 2023

Dr. Sanjay Rai
Acting Secretary of Higher Education
Maryland Higher Education Commission
6 North Liberty Street, 10th Floor
Baltimore, MD 21201

Dear Dr. Rai:

Howard Community College (HCC) requests your approval of a new associate of applied science (AAS) and lower division certificate (LDC) in Automotive Technology. These programs are intended to be stackable with one another; students may apply credits from the LDC toward the completion of the AAS degree. These programs will be offered in HCC's new Trades Center building, which is currently in the planning stage.

By offering these new programs, HCC will offer flexibility and opportunity to our students, while maintaining streamlined program oversight, resources, and assessment.

Please contact me if you need additional information or clarification.

Minah Woo
Vice President of Workforce, Innovation, & Strategic Partnerships
mwoo@howardcc.edu
443-518-4724

MHEC Automotive Technology A.A.S.
Howard Community College

A. Centrality to Institutional Mission and Planning Priorities:

1. Provide a description of the program, including each area of concentration (if applicable), and how it relates to the institution's approved mission.

Howard Community College (HCC) is committed to providing educational programs that meet the diverse needs of the community and central Maryland region. The foundation for these programs is a commitment to the HCC education ideal of creating a dynamic and effective learning environment for students.

Central to all academic programs at HCC is their adherence to the college's mission of "Providing pathways to success." This Automotive Technology associate of applied science (AAS) degree is designed to prepare students for career entry or career advancement in automotive repair and maintenance with a focus on hybrid and electric vehicles. Vehicle power alternatives and electronics technology are advancing rapidly. More and more, vehicles are comprised of complex systems involving batteries, computers, and sensors. The proposed curriculum emphasizes foundational skills in automotive repair and maintenance including, but not limited to, engines, brakes, steering, and suspension. It also focuses on multiple energy sources and advanced electrical systems. The program incorporates practical, collaborative learning experiences. Students will develop critical thinking, problem solving, and communication skills essential to working in a repair and maintenance environment. Students who complete the degree will have access to employment as an electric and hybrid vehicle service technician, battery service technician, electrical test technician, first line supervisor, installer/repairer, and parts manager.

2. Explain how the proposed program supports the institution's strategic goals and provide evidence that affirms it is an institutional priority.

HCC's Strategic Goals are:

- Student success, completion, and lifelong learning
- Organizational excellence
- Building and sustaining partnerships

This program aligns with HCC's "Student success, completion, and lifelong learning" goal in that the degree prepares students for well-paying careers in the growing automotive industry. In addition to industry preparation, general education courses provide skills in critical and creative thinking, scientific and quantitative reasoning, global competency, technological literacy, information literacy, and ethics.

In addition, HCC's president has identified the development of trade programs as an institutional priority.

3. Provide a brief narrative of how the proposed program will be adequately funded for at least the first five years of program implementation. (Additional related information is required in section L).

HCC currently offers an A.A.S. and certificate in Electronics Technology. HCC has invested in laboratory equipment and infrastructure, along with maintenance, to support hands-on instruction in the electronics program. HCC has a well-equipped engineering lab containing sensors and actuators, as well as electrical test equipment. HCC intends to outfit a new lab in a new building with high-quality industry-grade equipment, including a hybrid electric

vehicle (HEV), vehicle bays with lift, and diagnostic computers along with brake, engine, steering, suspension autonomous driving, adaptive cruise control, and camera trainers. Additionally, HCC will hire a faculty member with automotive expertise to support the program. HCC's president is committed to supporting these additional expenses in HCC's operating budget.

4. **Provide a description of the institution's a commitment to:**

   a. **ongoing administrative, financial, and technical support of the proposed program**

      HCC vigorously supports aligning academic programs to meet state and local workforce needs. As such, this program is directly aligned to those needs and is a part of HCC's high-priority plan to establish a Trades Center. For long-term support, HCC has garnered the commitment of Howard County to partially fund the design of this center and has aligned its operating and capital budget strategies to support this program. Additionally, HCC currently offers several engineering related degrees and an Electronics Technology certificate program. HCC's president is committed to adding one additional faculty member and supplying additional equipment to enable students to gain hands-on skills.

   b. **continuation of the program for a period of time sufficient to allow enrolled students to complete the program.**

      If HCC decides to discontinue the program in the future, the college will establish a teach-out plan, and students will be able to complete the program during a set teach-out period. HCC will support students throughout the completion of the program.

B. Critical and Compelling Regional or Statewide Need as Identified in the State Plan:

1. **Demonstrate demand and need for the program in terms of meeting present and future needs of the region and the State in general based on one or more of the following:**

   a. **The need for the advancement and evolution of knowledge**
   b. **Societal needs, including expanding educational opportunities and choices for minority and educationally disadvantaged students at institutions of higher education**
   c. **The need to strengthen and expand the capacity of historically black institutions to provide high quality and unique educational programs**

      Because HCC is an open access institution, and provides educational opportunities to students regardless of racial, ethnic, gender, socioeconomic, or educational backgrounds, this program is poised to minimize the disparities in Maryland's manufacturing workforce.

2. **Provide evidence that the perceived need is consistent with the Maryland State Plan for Postsecondary Education (MSPPE).**

"Science, Technology, Engineering and Mathematics (STEM) jobs have grown in importance in the labor market in recent decades, and they are widely seen as the jobs of the future (Black SE, Muller C, Spitz-Oener A, He Z, Hung K, Warren JR. The importance of STEM: High school knowledge, skills and occupations in an era of growing inequality. Res Policy. 2021 Sep;50(7):104249. doi: 10.1016/j.respol.2021.104249. Epub 2021 Apr 2. PMID: 34334836; PMCID: PMC8318355). While many STEM careers are considered to be high-skill jobs, there are also middle-skill STEM jobs. "Recent work suggests that the labor market outcomes of those in the middle of the wage distribution strongly depends on the workers' skills, with more able workers better adapting to the changing labor markets..." (Black). The proposed automotive technology program is a STEM program that addresses the need for advancement and evolution of knowledge in the STEM fields. It will also enable graduates to gain the skills necessary to gain higher wages and adapt in an evolving labor market.

This automotive technology AAS program supports Priority 5 of the Maryland State Plan for Postsecondary Education ("the Plan"). The Plan indicates that "[a]dvances in technology and changes in the economic infrastructure will continue to change the needs of the workforce, in which postsecondary education will need to adapt with these changes." This program will apply academic experiences using real-world equipment utilizing lab-based learning to address advances in technology and the changing needs of the automotive workforce.

C. Quantifiable and Reliable Evidence and Documentation of Market Supply and Demand in the Region and State:

1. **Describe potential industry or industries, employment opportunities, and expected level of entry (*ex: mid-level management*) for graduates of the proposed program.**
2. **Present data and analysis projecting market demand and the availability of openings in a job market to be served by the new program.**
3. **Discuss and provide evidence of market surveys that clearly provide quantifiable and reliable data on the educational and training needs and the anticipated number of vacancies expected over the next 5 years.**
4. **Provide data showing the current and projected supply of prospective graduates.**

The need for automotive and maintenance technicians with the skills to repair and maintain hybrid and electric vehicles (EV) is expected to grow because of rising sales of electrified vehicles and the steady introduction of new models by manufacturers.

The U.S. Bureau of Labor Statistics (BLS) compiled a September 2011 report on Careers in Electric Vehicles. Job duties BLS identified for technicians and mechanics include:

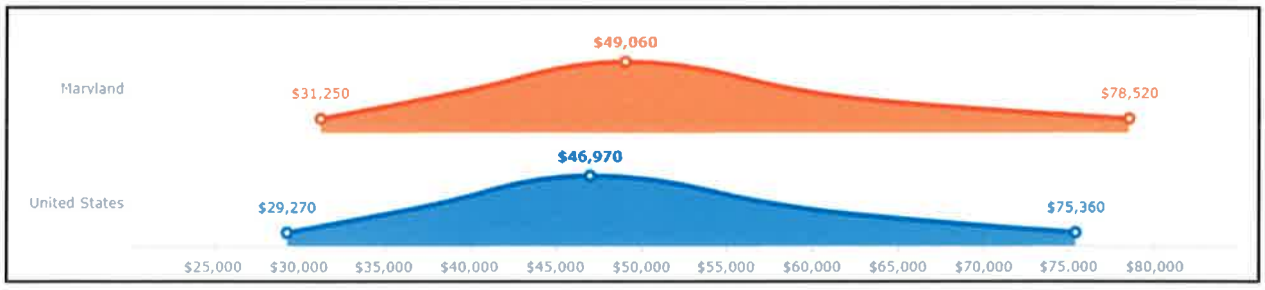
- Inspection
- Maintenance
- Repair

Because of the integrated electronic systems and complexity of the computers regulating the vehicles, use of computer equipment and electronic components are essential job duties for an EV maintenance and repair technician. BLS did not have any wage data specific to the EV industry.

Although this study occurred some time ago, BLS still does not publish employment data for occupations specific to the electric vehicle industry. As such, the closest professions are detailed below. These statistics do not fully capture job demands and expectations in a green/EV economy.

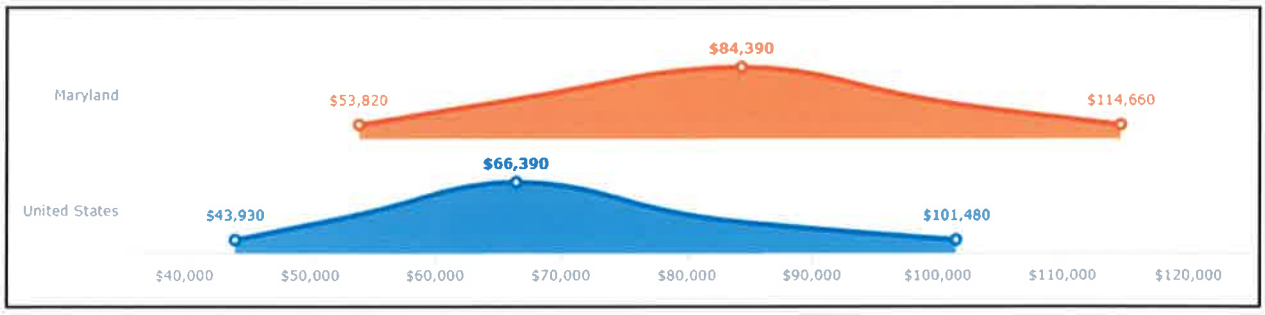
Automotive Service Technicians and Mechanics
SOC 49-3023.00

Wages in Maryland for this position are slightly above national trends.



For the Baltimore-Columbia-Towson region, the annual median wage is $47,940. Employment is expected to decrease slightly in Maryland with 12,790 employees in 2031.

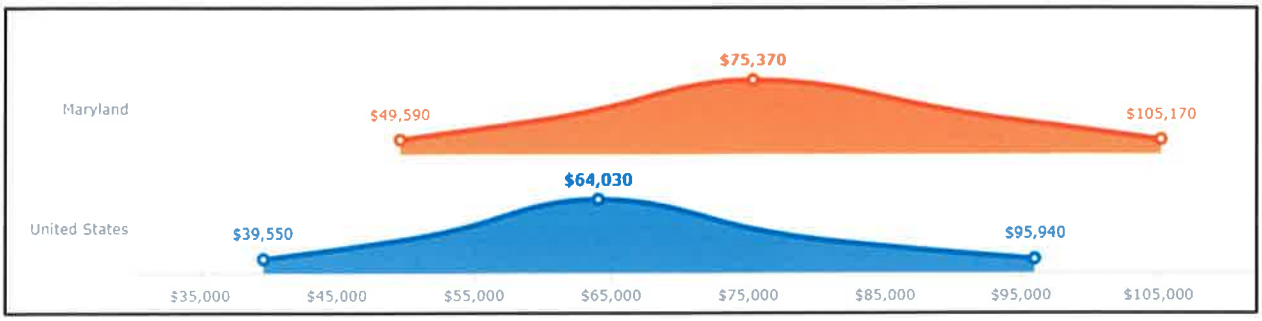
Electrical and Electronic Engineering Technologists and Technicians
SOC 17-3023.00
Wages in Maryland for this position far outpace national trends.



For the Baltimore-Columbia-Towson region, the annual median wage is $82,040. Employment is expected to grow at a rate of 1% with 3,590 electrical engineering technologists and technicians employed in Maryland in 2031.

Electrical and Electronics Repairers, Commercial and Industrial Equipment
SOC 49-2094.00

Wages in Maryland for this position far outpace national trends.



For the Baltimore-Columbia-Towson region, the annual median wage is $75,160. Employment is expected to grow at a rate of 9% with 740 commercial and industrial electrical repair workers employed in Maryland in 2031.

A skilled workforce is essential to advancing clean energy initiatives in traditional and new fields, including, but not limited to, renewable energy and energy efficiency. Specifically regarding electric vehicles, vehicle repair facilities are experiencing a growing need for repair and maintenance technicians that possess the skills to safely diagnose and repair electric vehicle ("EV") malfunctions. After-market/after-warranty repair facilities require the technology and tools to diagnose and repair various EV makes and models.

In 2021, the University of Maryland School of Public Policy Center for Global Sustainability projected the creation of up to 1.15 million new full-time jobs through 2025 in offshore wind, energy efficiency, energy storage, and electric vehicles ("New U.S. Green Economy Report series identifies states most prepared to seize clean energy growth" 2021). Specifically, "the electric vehicle market in the U.S. is poised for rapid acceleration as a result of government-backed incentives, growing consumer acceptance, improving vehicle performance, declining battery costs and increased infrastructure investment. California is leading the way, followed by Washington, New York, Massachusetts and Colorado."

Maryland is the 12th largest green industry in the country and ranks 7th in the nation for Green Goods and Services employment (Economic Alliance of Greater Baltimore, Maryland's Green Economy). Legislation passed in 2019 established a Clean Energy Workforce Account within the Maryland Department of Labor to fund clean energy job training related to renewable energy, energy efficiency, energy storage, resource conservation, and advanced transportation.[1] Starting in fiscal year (FY) 2021, a maximum of $8 million in grants will be provided to fund apprenticeship programs that prepare candidates for careers in clean energy industry jobs.[2] A total budget of $1.2 million is allocated for FY 2021 and are permitted to cover 75 percent of participating programs' costs (Towson University Green Workforce Development Statewide Data Request).

On March 11, 2022, the Maryland Department of Commerce announced that Greenland technologies will be locating an electric industrial vehicle manufacturing facility in Maryland.

Bloomberg and Deloitte issued reports assessing the EV market. The September 2021 Deloitte Evaluating Electric Vehicle Market Growth Across U.S. Cities, evaluates consumer sentiment and the existing EV market. The Bloomberg Electric Vehicle Outlook 2021 projects the future EV market with a focus on the near-term 2025 projections.

Deloitte indicates that the market is influenced by regulations, including Net-Zero policy, that incentivize automakers to develop and manufacture EVs, charging infrastructure, and

consumer incentives. Notably, post Deloitte's publication, the Biden administration committed $5 billion in building charging station infrastructure.

Based upon these factors, Maryland has experienced a stronger EV uptake and share of the EV market than many other states.

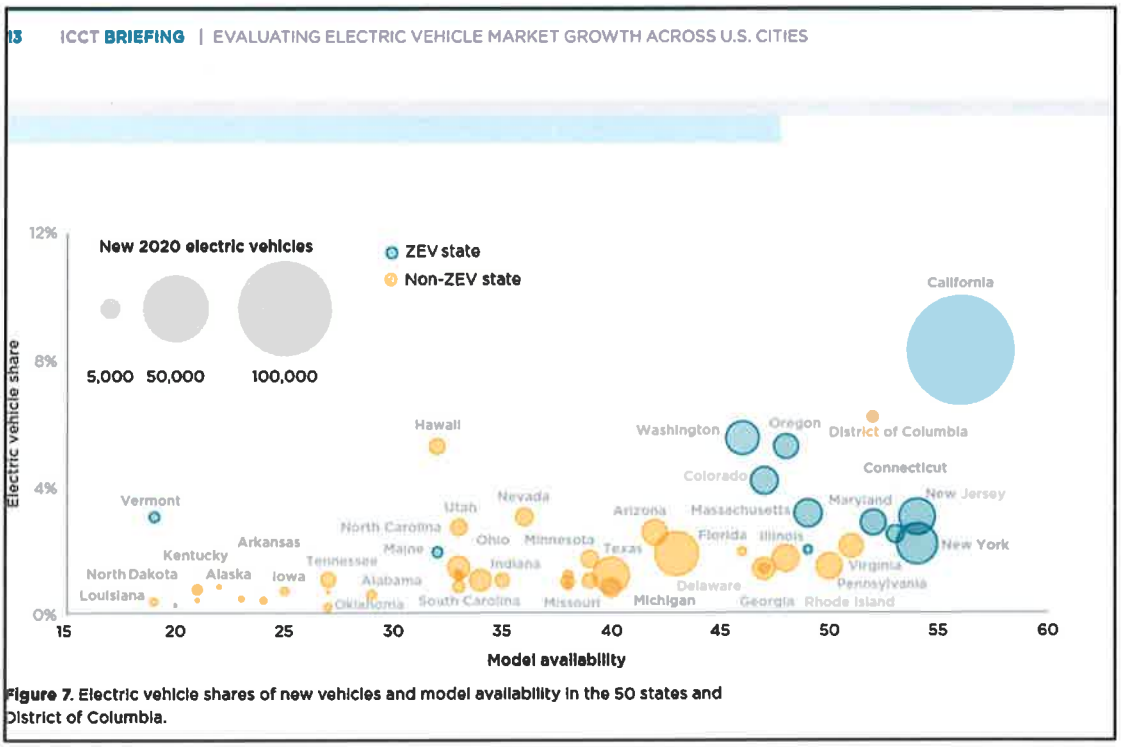


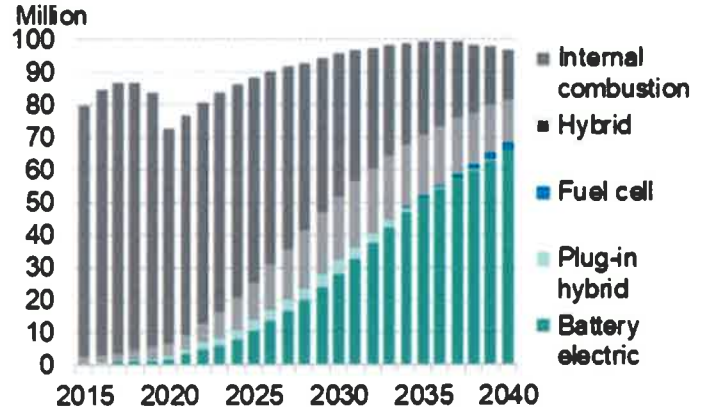
Figure 7. Electric vehicle shares of new vehicles and model availability in the 50 states and District of Columbia.

Deloitte's current data show that consumers still prefer gasoline and diesel for their next vehicle purchase.

Bloomberg indicates that there are currently 12 million passenger EVs on the road. This is just 1% of the global fleet. It projects on the road EVs to rise to 54 million by 2025. Bloomberg notes that the commercial van and truck market is behind, but is "picking up speed." The following graphic illustrates Bloomberg's prediction that internal combustion engines will be a minority of passenger vehicle sales, with EV taking the greatest market share.

Figure 4

Global passenger vehicle sales outlook by drivetrain - Economic Transition Scenario

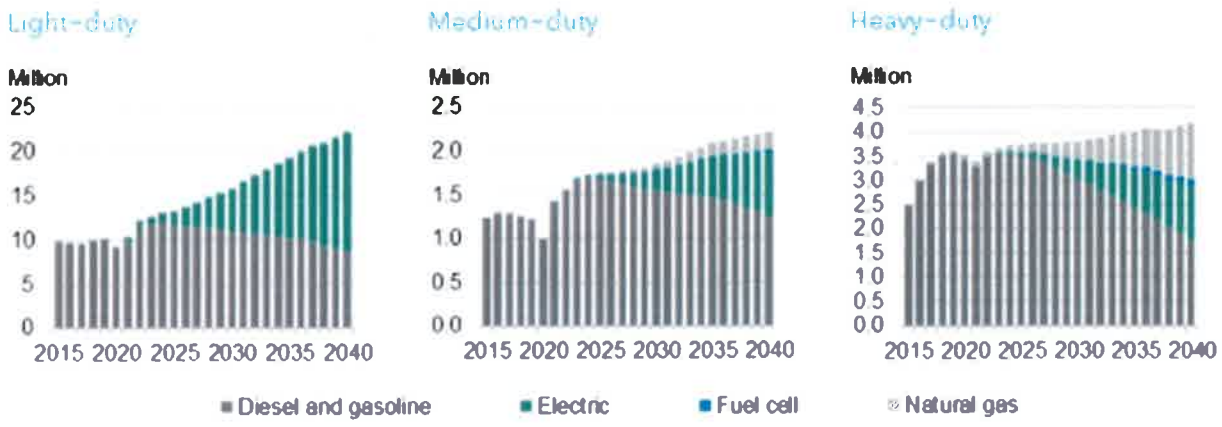


Source: BNEF.

Bloomberg also projects that EV will take a greater share of light-duty commercial truck sales, but that gas/diesel will still dominate the medium and heavy-duty truck markets.

Figure 8

Global commercial vehicle sales outlook by drivetrain and segment - Economic Transition Scenario



Source: BNEF. Note: Electric includes battery-electric, plug-in hybrid electric and range-extended; natural gas includes compressed and LNG.

Economic Modeling Specialist International (EMSI) Job Posting Analytics for September 2016 -2018 covering Carroll, Baltimore, Frederick, and Howard counties related to electric car revealed 147 job postings. Moving forward to calendar year 2021, there were 121 unique job postings.

As part of the Rural Maryland Council SPARK! grant, in which HCC participated as a supporting and seat-sharing partner, Carroll Community College hosted an EV Focus Group. The group was comprised of automotive dealers and after-market/after-warranty repair shops. The EV focus group indicated that it did not presently employ sufficient workers with the knowledge, skills, and abilities to safely and effectively undertake EV repair and maintenance. Toyota has infrastructure to upskill its workforce but has a demand for new auto technicians with basic skills and EV skills. After-market/after-warranty repair shops do not have the benefit of such infrastructure.

D. Reasonableness of Program Duplication:

1. Identify similar programs in the State and/or same geographical area. Discuss similarities and differences between the proposed program and others in the same degree to be awarded.

Regionally, other community colleges have similar programs, but the need for skilled workers is still unmet. The Community College of Baltimore County has an Automotive Technology A.A.S with a Global Option and a Ford, General Motors, Nissan option. Montgomery College has an Automotive Electrical Systems Specialist Certificate. While these programs provide foundational automotive technology courses, none of the programs specifically target the electric vehicle industry as HCC does in its proposed program.

2. Provide justification for the proposed program.

This proposed program is designed to prepare students for well-paying careers in the Maryland's green economy by providing students with knowledge, skill, and abilities necessary for today's and tomorrow's automotive repair technicians. With its foundation in basic automotive systems, such as brake, steering, suspension, and engines, graduates will be prepared to repair and maintain gas powered vehicles. Unlike other automotive programs in this State, the proposed program focused on high voltage batteries and advanced driver systems that prepare graduates to repair and maintain hybrid and electric vehicles in a market where demand is growing quickly.

This program will enable Maryland to expand its capacity to prepare highly skilled workers for jobs with family sustaining wages and employment opportunities in a green economy.

E. Relevance to High-demand Programs at Historically Black Institutions (HBIs)

1. Discuss the program's potential impact on the implementation or maintenance of high-demand programs at HBIs.

The proposed program will not impact the implementation or maintenance of programs at HBIs. No other Maryland HBIs offer similar programs.

F. Relevance to the identity of Historically Black Institutions (HBIs)

1. **Discuss the program's potential impact on the uniqueness and institutional identities and missions of HBIs.**

   The proposed program will not impact the uniqueness and institutional identities and missions of HBIs.

G. Adequacy of Curriculum Design, Program Modality, and Related Learning Outcomes (as outlined in COMAR 13B.02.03.10):

1. **Describe how the proposed program was established, and also describe the faculty who will oversee the program.**

   HCC constructed this program with inputs from the RMC SPARK! initiative, Kauai Community College's open education resources developed as part of the Rural Hawaii Community Colleges Workforce Development Program TAACCCT Grant (Skills Commons), and the Program Guide for Developing Electric Vehicle programs published by the National STEM Consortium (Agia, L. Eugenie (2014); *NSC Electric Vehicle Technology Program Guide*; The National STEM Consortium).

   As part of the Rural Maryland Council SPARK! grant, in which HCC participated as a supporting and seat-sharing partner, Carroll Community College hosted an EV focus group. The group was comprised of automotive dealers and after-market/after-warranty repair shops. The EV focus group indicated that it did not presently employ sufficient workers with the knowledge, skills, and abilities to safely and effectively undertake repair and maintenance generally and, in particular, did not have a sufficiently skilled workforce to perform hybrid and electric vehicle repair.

   The focus group indicated that those employees will need to:

   - Possess foundational skills in automotive repair
   - Safely repair brakes, steering, suspension, and engine systems
   - Diagnose faults using specialized equipment and computers
   - Program computers
   - Safely work with energy sources, such as high voltage batteries
   - Understand complex systems and how they are interrelated
   - Think critically to identify problems and solutions
   - Safely work on electronics, sensors, cameras, and other advanced driver systems

   The focus group indicated that work tickets for electronics, sensors, cameras, and advanced driver systems dominate the businesses' repair schedules. It also indicated that Automotive Service Excellence (ASE) industry certifications were helpful in assessing prospective employees' competencies.

   The SPARK! initiative also hired a subject matter expert, who is currently working in the automotive repair and maintenance industry to develop curriculum aligned to the ASE certifications and feedback from the workgroup. This work has been incorporated into the proposed program. Additionally, HCC mapped preparation for ASE certifications into the program. Those certifications include the ASE G1 Maintenance and Light Repair

Certification, the L3 Light Duty Hybrid/EV Specialist Certification, and the Advanced Driver Assistance Systems Specialist Certification.

As there are no current faculty, HCC will hire one assistant professor qualified to teach courses and oversee curriculum in the proposed program.

2. Describe educational objectives and learning outcomes appropriate to the rigor, breadth, and (modality) of the program.

Upon completion of this program, students will be able to:

1. Apply safety standards and protocols.
2. Diagnose, repair, and test braking systems.
3. Diagnose, repair, and test engine systems.
4. Diagnose, repair, and test steering and suspension systems.
5. Diagnose, repair, and test high voltage battery systems.
6. Diagnose, repair, and test electronic systems.
7. Diagnose, repair, and test advanced driver systems.
8. Use automotive tools appropriately for specific test, maintenance, and repair tasks.
9. Program automotive computers.
10. Apply communication skills needed to work collaboratively in a technical organization.
11. Understand and apply ethical reasoning in the context of the automotive industry.

3. Explain how the institution will:

a. provide for assessment of student achievement of learning outcomes in the program

Program and course reviews are completed according to the schedule provided by HCC in collaboration with faculty members, department chairs, academic deans, the eLearning department, and the office of learning outcomes assessment (LOA).

b. document student achievement of learning outcomes in the program

Artifacts for the assessment of outcomes are collected and shared through HCC's learning management system, Canvas. Course and program reviews are completed with support from the LOA office. Once an assessment is completed, an action plan will address findings as part of the outcomes assessment process.

4. Provide a list of courses with title, semester credit hours and course descriptions, along with a description of program requirements.

Automotive Technology A.A.S. (Career)

The Automotive Technology degree is designed to prepare students for career entry or career advancement in automotive repair and maintenance on gas powered, hybrid, and electric vehicles. Automotive repair and maintenance is becoming increasingly technology dependent, requiring highly skilled workers who are familiar not only with conventional brake, steering, engine, and suspension systems but also with electronics, high-voltage power sources, and computers. The curriculum includes foundational skills in conventional automotive repair including, but not limited to, braking, steering, engine, and steering systems. It also includes a focus on the skills and knowledge required to work on hybrid and electric vehicles. Students who complete the degree will be prepared to earn Automotive Service Excellence (ASE) certifications and have access to employment as an electric and hybrid vehicle service technician, battery service technician, electrical test technician, first line supervisor, installer/repairer, and parts manager.

Suggested Semester 1		
Course Number	**Title**	**Minimum Credits**
ENGL 121	College Composition	3
AUTO 100	Introduction to Automotive Technology	4
ENGT 100	Fundamental Skills for Technology and Engineering	4
MATH 141	College Algebra (or higher core course)	4

Suggested Semester 2		
Course Number	**Title**	**Minimum Credits**
AUTO 101	Repair and Maintenance of Automotive Electrical Systems	3
AUTO 110	Engine Performance Systems	3

AUTO 120	Hybrid and Electric Vehicles	3
ENST 105/ ENST 115	Environmental Science	4
BMGT 203	Business Ethics	3

Suggested Semester 3		
Course Number	**Title**	**Minimum Credits**
AUTO 201	Repair and Maintenance of Automotive Batteries	3
AUTO 202	Repair and Maintenance of Automotive Brake Systems	3
AUTO 210	Driver Assistance Systems	3
PHYS 101	Technical Physical Science	4
Gen Ed Core	Social & Behavioral Sciences - Global Competency Core	3

Suggested Semester 4		
Course Number	**Title**	**Minimum Credits**
AUTO 203	Repair and Maintenance of Automotive Suspension & Steering	3
AUTO 220	Light Duty Hybrid/Electric Vehicles	3

ENGT 150	Professional Skills for Trades and Manufacturing	1
HUMN 115	Entrepreneurship and Creativity	3
Gen Ed Core	Oral Communication Core	3

TOTAL CREDIT HOURS: 60

Course Descriptions

AUTO 100 Introduction to Automotive Technology - 4 credits
This Course introduces students to automotive technology, service, and light repair. Topics covered include the utilization of online information systems, safety, hazardous material handling, tools and equipment, vehicle hoisting, multipoint vehicle inspection, and vehicle maintenance and light repair.

AUTO 101 Repair and Maintenance of Automotive Electrical Systems - 3 credits
This course will cover how to diagnose and repair electrical problems in a vehicle. Students will be prepared to take the Individual ASE Electrical/Electronic Systems Certification at the completion of the course. No prior work experience is required. This course maps to the ASE A6 certification.

AUTO 110 Engine Performance Systems - 3 credits
This course will examine vehicle engine performance including, General Diagnosis, Ignition System Diagnosis and Repair, Fuel, Air Induction and Exhaust Systems Diagnosis and Repair, Emission Control Systems Diagnosis and Repair, Computerized Engine Control Diagnosis and Repair (Including OBD II). This course maps to the ASE 8 certification.

AUTO 120 Hybrid and Electric Vehicles - 3 credits
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 electric machines, and permanent magnet electric motors theory and construction. Hands-on application of safe disconnect procedures and high voltage analysis tools to perform basic checks. Prerequisite: Introduction to Automotive Technology

AUTO 201 Repair and Maintenance of Automotive Batteries - 3 credits
This course will examine the purpose, parts, operation, and failure diagnosis of automotive batteries, cranking systems, and charging systems. Cruise control, remote keyless entry, theft deterrent, and remote start systems are also covered. Laboratory exercises emphasize on-vehicle use of common and specialized electrical service tools. Prerequisite: Introduction to

Automotive Technology, Co-Requisite: Repair and Maintenance of Automotive Electrical Systems

AUTO 202 Repair and Maintenance of Automotive Brake Systems - 3 credits
This course examines the diagnosis of different types of brake systems. This course maps to the entry-level ASE Brakes Certification

AUTO 210 Driver Assistance Systems - 3 credits
This course will explore the diagnosis, repair, and calibration of advanced driver assistance systems in modern automobiles and light trucks. This course maps to the ASE L4 certification. Prerequisite: Light Duty Hybrid

AUTO 203 Repair and Maintenance of Automotive Suspension & Steering - 3 credits
This course will cover how to diagnosis and repair steering, suspension, and wheel alignment problems. This course maps to the entry-level ASE Suspension and Steering Certification. No hands-on work experience is required to complete this course. Prerequisite: Repair and Maintenance of Automotive Brake Systems

AUTO 220 Light Duty Hybrid/Electric Vehicles - 3 credits
This course will examine battery systems, internal combustion engine, drive system, power electronics, and hybrid supporting systems in light duty hybrid/electric vehicles. This course maps to the ASE L3 certification. Prerequisite: Engine Performance Systems

ENGL 121 College Composition - 3 credits
This course teaches students to develop and apply rhetorical knowledge for creating effective text-based communication. Students develop critical inquiry and multi-stage writing processes in order to contribute productively, effectively, and ethically to the social and collaborative practices of academic and other discourses. Coursework guides students toward understanding themselves as authors of texts that hold meaning, and students successfully completing the course will be able to compose texts of at least 1,000 words, demonstrating knowledge of conventions and manuscript presentation relevant to varying rhetorical situations. ENGL 121 transfers as university-parallel freshman English. Students must earn a final grade of C or better to pass this course.

ENGT 100 Fundamental Skills for Technology and Engineering - 4 credits
This course prepares students for success in an Engineering transfer program or Technology program with basic electrical and mechanical knowledge and experiences such as collecting and interpreting data, using appropriate units, basic troubleshooting, and reverse engineering. Students will use mathematical functions and graphs to model and analyze data collected from physical systems, and will get started in the physical world through general shop safety training and measuring with a carpenter's square, calipers, and micrometer. In addition, students will gain fabrication and assembly experience with hand and powered tools. Students will get started in the electronics world measuring voltage, current, and resistance, and will begin building breadboard circuits. Study may begin specialization into topics such as programming, refrigeration, pneumatics, and fluidics.

ENGT 150 Professional Skills for Trades and Manufacturing - 1 credit
This course is designed to develop or refresh knowledge and skills required for technical positions in advanced manufacturing and technical trades fields and will focus upon professionalism, critical thinking, communication and workplace success.

ENST 105/ENST 115 Environmental Science - 4 credits
This course involves the study of ecosystem and community ecology, population dynamics, climate, biomes, species diversity and natural selection, species interactions, agriculture, toxicology, air and water pollution, and energy resources. This course is designed for non-science majors and science majors alike, and introduces students to the basics of scientific inquiry and basic chemistry.

HUMN 115 Entrepreneurship and Creativity - 3 credits
This course is designed to introduce students to the concept of sustainable entrepreneurship, a manageable process that can be applied across careers and work settings. It focuses on building entrepreneurial attitudes and behaviors that will lead to creative solutions within community and organizational environments. Course topics include the history of entrepreneurship, the role of entrepreneurs and intrapreneurs in the 21st century global economy, and the identification of entrepreneurial opportunities. The elements of creative problem-solving, the development of a business concept/model, the examination of feasibility studies, and the social/moral/ethical implications of entrepreneurship are incorporated. This course is directed toward forging views of entrepreneurship and intrapreneurship as they operate in today's world. Credit will only be granted for one of the following: ENTR 100 or HUMN 115.

MATH 141 College Algebra - 4 credits
Topics include functions, mathematics of finance, matrices, and linear programming. Emphasis will be placed on solving problems algebraically and modeling applications involving business, financial literacy, and global awareness. Appropriate technological tools used in business and the social sciences will also be introduced. All sections require the use of the interactive computer program that comes with the software code and a graphing calculator (TI-84 recommended; TI-89 not permitted).

PHYS 101 Technical Physical Science - 4 credits
This physical science course covers basic introductory physics and chemistry and is designed for Allied Health program majors (RadTech and Cardiovascular), technology majors (BMET, Computer Support, and Electronics) and other non-science majors. It consists of basic scientific mathematics and an integrated sequence of physical science and chemical principles. This course will enable students to become aware of, to identify, and to evaluate situations and/or problems in contemporary physical science which include: science measurement and dimensional plus statistical analysis techniques. Special emphasis is placed upon learning physics principles and solving mathematical problems in density/specific gravity, gas laws, solutions, pressure, fluids, basic electricity, magnetism, sound and light waves, and the atomic structure of matter. The laboratory program will allow the student to develop an understanding of the fundamental principles of the above mentioned areas, including problem solving, and their application to physical phenomenon observed.

5. Discuss how general education requirements will be met, if applicable.

Students at HCC meet general education requirements by completing a minimum of 18 credits of approved courses that meet the Code of Maryland (COMAR) regulations, and

which include the following goals:

- Critical and Creative Thinking
- Global Competency
- Information Literacy
- Technological Literacy
- Scientific and Quantitative Reasoning
- Written Communication
- Oral and Expressive Communication

Students will be required to complete coursework determined by faculty and approved by the general education subcommittee. Once assessment is complete, an action plan will address findings as part of the ongoing general education assessment process.

6. **Identify any specialized accreditation or graduate certification requirements for this program and its students.**

   N/A

7. **If contracting with another institution or non-collegiate organization, provide a copy of the written contract.**

   N/A

8. **Provide assurance and any appropriate evidence that the proposed program will provide students with clear, complete, and timely information on the curriculum, course and degree requirements, nature of faculty/student interaction, assumptions about technology competence and skills, technical equipment requirements, learning management system, availability of academic support services and financial aid resources, and costs and payment policies.**

   HCC will provide students with timely and accurate information on all curriculum requirements, course offering methodology, Canvas, academic support services, financial aid services, and policies regarding costs and payment by making the information easily accessible to students on HCC's website, in the college catalog, schedules of classes, and admissions and orientation materials.

9. **Provide assurance and any appropriate evidence that advertising, recruiting, and admissions materials will clearly and accurately represent the proposed program and the services available.**

   All advertising, recruiting, and admissions materials will be clear and accurate in the representation of the proposed program and services available to students.

H. Adequacy of Articulation

1. **If applicable, discuss how the program supports articulation with programs at partner institutions. Provide all relevant articulation agreements.**

   N/A

I. **Adequacy of Faculty Resources (as outlined in COMAR 13B.02.03.11).**

1. **Provide a brief narrative demonstrating the quality of program faculty. Include a summary list of faculty with appointment type, terminal degree title and field, academic title/rank, status (full-time, part-time, adjunct) and the course(s) each faculty member will teach (in this program).**

   There are no current full-time faculty. HCC is committed to hiring a qualified full-time faculty member to manage curriculum and teach technical AUTO courses in the proposed program. The faculty member's qualifications include an associates degree or Certificate in automotive technology from an accredited institution with ten years of documented experience in the field of automotive repair and maintenance. The faculty member is required to be ASE certified or must become ASE certified within one year. Additional coursework will be taught by adjunct faculty experienced in teaching general education and technical courses within the program.

2. **Demonstrate how the institution will provide ongoing pedagogy training for faculty in evidenced-based best practices, including training in:**

   a. **Pedagogy that meets the needs of the students**
   b. **The learning management system**
   c. **Evidence-based best practices for distance education, if distance education is offered.**

   HCC provides continuous teaching improvement and ongoing training for full- and part-time faculty year-round in distance education, the learning management system (Canvas), and other pedagogical-related topics, with concentrated training available during professional development periods in May, August, and January, which always include sessions on learner-specific needs and universal design.

J. **Adequacy of Library Resources** (as outlined in COMAR 13B.02.03.12).

1. **Describe the library resources available and/or the measures to be taken to ensure resources are adequate to support the proposed program. If the program is to be implemented within existing institutional resources, include a supportive statement by the President for library resources to meet the program's needs.**

   The James Clark, Jr. Library offers a wide array of print and online resources that are adequate for the proposed program. From the library's website, individuals can search the online catalog for approximately 68,000 items, including books, e-books, and audiovisual titles. Library resources may be used or borrowed by current HCC students, faculty, and staff using their HCC ID card. The library also provides access to e-journals through online database subscriptions. Off-campus access to databases, e-journals, e-books, and online

course reserves is available to the college community via a current HCC login and password.

Research assistance is available at the library service desk, by appointment, and via email. Classes and online learning objects for information literacy instruction are regularly offered. Open seven days a week in the fall and spring semesters, the library is outfitted with group study rooms, quiet zones, silent areas, and seating areas for comfortable reading. Computers are available for research and writing and there is wireless connection and power outlets for mobile devices.

Program faculty may recommend materials for the library collection. First priority will be given to those materials that support the instructional program. Orders for previewing of high-cost video and multimedia items may be arranged through the library. Specialized materials not available in the library and not appropriate for purchase for the College's collection may be requested by faculty through interlibrary loan.

HCC's president affirms that the college's existing library resources will meet the needs of the proposed program.

K. Adequacy of Physical Facilities, Infrastructure and Instructional Equipment (as outlined in COMAR 13B.02.03.13)

1. **Provide an assurance that physical facilities, infrastructure and instruction equipment are adequate to initiate the program, particularly as related to spaces for classrooms, staff and faculty offices, and laboratories for studies in the technologies and sciences. If the program is to be implemented within existing institutional resources, include a supportive statement by the President for adequate equipment and facilities to meet the program's needs.**

   The facilities for the program will be located in a new proposed building at HCC. The new lab will be outfitted with high-quality industry-grade equipment, including a hybrid electric vehicle (HEV), vehicle bays with lift, and diagnostic computers along with brake, engine, steering, suspension autonomous driving, adaptive cruise control, and camera trainers.

   HCC's president affirms that the existing and planned resources are adequate to meet the needs of this AAS degree.

2. **Provide assurance and any appropriate evidence that the institution will ensure students enrolled in and faculty teaching in distance education will have adequate access to:**

   a. **An institutional electronic mailing system, and**

      All students who register for a credit course at HCC receive an HCC student email account.

   b. **A learning management system that provides the necessary technological support for distance education**

HCC's office of student computer support (SCS) provides Canvas and Google Apps training and support for HCC students at locations on campus, in classrooms, and online. Technology workshops and "Ask an Expert" sessions are held at various hours and locations each semester. Students can access Canvas through HCC's website. Canvas is the learning management system through which course information and content is provided to students in online and hybrid courses, and faculty can communicate supplemental course material to students in face-to-face classes.

L. Adequacy of Financial Resources with Documentation (as outlined in COMAR 13B.02.03.14)

1. Complete Table 1: Resources and Narrative Rationale. Provide finance data for the first five years of program implementation. Enter figures into each cell and provide a total for each year. Also provide a narrative rationale for each resource category. If resources have been or will be reallocated to support the proposed program, briefly discuss the sources of those funds.

The calculations below represent estimated tuition, consolidated fees, and course fees, based on the estimated number of students in the program each year. No resources will be reallocated to this program.

TABLE 1: PROGRAM RESOURCES

Resource Categories	Year 1	Year 2	Year 3	Year 4	Year 5
1. Reallocated Funds	$0	$0	$0	$0	$0
2. Tuition/Fee Revenue (c+g below)	$66,531.60	$82,492	$106,943.60	$123,616.20	$135,750.60
a. Number of F/T students	8	10	13	16	18
b. Annual Tuition/Fee Rate	$5,110.20	$5,171.20	$5,232.20	$5,293.20	$5,354.20
c. Total F/T Revenue (a x b)	$40,881.60	$51,712	$68,018.60	$84,691.20	$96,375.60
d. Number of P/T students	10	12	15	15	15
e. Credit Hour Rate	$171	$171	$173	$173	$175
f. Annual Credit Hour Rate	15	15	15	15	15
g. Total P/T Revenue (d x e x f)	$25,650	$30,780	$38,925	$38,925	$39,375
3. Grants, Contract & Other External Sources	$0	$0	$0	$0	$0
4. Other Sources	$175,000[1]	$0	$0	$0	$0

TOTAL (Add 1-4)	$241,531.60	$82,492	$106,943.60	$123,616.20	$135,750.60

[1] Note that this revenue is part of the FF&E funds associated with the new workforce development and trades center building for new equipment.

All tuition and fees are based on in-county tuition rates.

2. **Complete Table 2: Program Expenditures and Narrative Rationale. Provide finance data for the first five years of program implementation. Enter figures into each cell and provide a total for each year. Also provide a narrative rationale for each expenditure category.**

TABLE 2: PROGRAM EXPENDITURES					
Expenditure Categories	**Year 1**	**Year 2**	**Year 3**	**Year 4**	**Year 5**
1. Faculty (b + c below)	$98,051	$98,051	$100,993	$100,993	$100,993
a. Number of FTE	1	1	1	1	1
b. Total Salary	$75,611	$75,611	$77,880	$77,880	$77,880
c. Total Benefits	$22,440	$22,440	$23,113	$23,113	$23,113
2. Admin. Staff (b + c below)	$0	$0	$0	$0	$0
a. Number of FTE	0	0	0	0	0
b. Total Salary	$0	$0	$0	$0	$0
c. Total Benefits	$0	$0	$0	$0	$0
3. Support Staff (b + c below)	$0	$0	$0	$0	$0
a. Number of FTE	0	0	0	0	0
b. Total Salary	$0	$0	$0	$0	$0
c. Total Benefits	$0	$0	$0	$0	$0
4. Technical Support and Equipment	$175,000[1]	$10,000	$10,000	$10,000	$10,000
5. Library	$0	$0	$0	$0	$0

6. New or Renovated Space	$0	$0	$0	$0	$0
7. Other Expenses	$1,000	$1,000	$1,000	$1,000	$1,000
TOTAL (Add 1-7)	$274,051	$109,051	$111,993	$111,993	$111,993

[1] Note that this expenditure for new equipment is part of the FF&E funds associated with the new workforce development and trades center building.

The program expenses will be sustainable with tuition and fees by year four.

M. Adequacy of Provisions for Evaluation of Program (as outlined in COMAR 13B.02.03.15).

1. **Discuss procedures for evaluating courses, faculty and student learning outcomes.**

   The proposed program will be part of the established institutional assessment process at HCC. Courses are assessed on an ongoing basis. Faculty are evaluated on an annual basis, as part of HCC's routine process.

2. **Explain how the institution will evaluate the proposed program's educational effectiveness, including assessments of student learning outcomes, student retention, student and faculty satisfaction, and cost-effectiveness.**

   Programs are assessed as a whole every five years. Program assessment includes student learning outcomes, retention, and student satisfaction. HCC uses the IDEA survey to monitor student satisfaction. Faculty satisfaction is reviewed annually as part of the faculty evaluation process. Cost effectiveness is reviewed each year as part of the budget development process.

N. Consistency with the State's Minority Student Achievement Goals (as outlined in COMAR 13B.02.03.05).

1. **Discuss how the proposed program addresses minority student access & success, and the institution's cultural diversity goals and initiatives.**

   HCC values diversity and recognizes the critical role of an educational institution in preparing its students, faculty, and staff to become contributing members of the global community. HCC's Diversity, Equity, and Inclusion Committee promotes conversation, exchange, and an increased awareness of diversity issues affecting the college community. HCC acknowledges that diversity is recognizing, appreciating, respecting, listening to, and learning from the unique talents and contributions of all people.

   Faculty and staff of HCC are committed to the success of each student. HCC values and has clear policies on diversity, which are followed by all employees. Employees are required to complete online training modules focused on FERPA rights and responsibilities, harassment awareness and avoidance, safety, and emergency operations, and the College

Vision, Mission, Values, Beliefs, and Strategic Initiatives. Refresher training models are required at intervals determined by HCC's president's team.

HCC recognizes the importance of addressing the issue of minority student achievement, as evidenced by our Silas Craft Collegians (SCC) program, Ambiciones program, and Howard P.R.I.D.E. program. The SCC program focuses on recent high school graduates whose academic achievement does not reflect their true potential. The program attempts to close this gap by maximizing academic achievement, retention, graduation, and transfer. The Ambiciones program builds community among Hispanic/Latino students by providing networking opportunities, educational and recreational activities, and workshops with other Hispanic/Latino students and campus organizations. In addition, students can receive specialized guidance with campus services such as advising and financial aid. Howard P.R.I.D.E. encourages the continued academic, professional, and personal development of black and minority male students via tutoring, mentoring, service learning, leadership seminars, and individual academic advising and career plans.

O. Relationship to Low Productivity Programs Identified by the Commission:

1. **If the proposed program is directly related to an identified low productivity program, discuss how the fiscal resources (including faculty, administration, library resources and general operating expenses) may be redistributed to this program.**

   The proposed program is not related to an identified low productivity program.

P. Adequacy of Distance Education Programs (as outlined in COMAR 13B.02.03.22)

1. **Provide affirmation and any appropriate evidence that the institution is eligible to provide Distance Education.**

   This program is not being proposed as a distance education program.

2. **Provide assurance and any appropriate evidence that the institution complies with the C-RAC guidelines, particularly as it relates to the proposed program.**

   N/A