HAGERSTOWN COMMUNITY COLLEGE

11400 Robinwood Drive • Hagerstown, Maryland 21742-6514 • 240-500-2000

Office of the Vice President of Academic Affairs and Student Services

James D. Fielder, Ph.D.
Secretary of Higher Education
The Maryland Higher Education Commission
6 N. Liberty St.
Annapolis, MD 21201

August 5, 2018

Dear Dr. Fielder,

I am pleased to submit for approval a Lower Division Certificate in Unmanned Aerial Systems Technician. The Hagerstown Community College Board of Directors has approved the new program.

Thank you for your consideration of this proposed program; a check was sent to the MHEC office for the substantive fee. If I can provide additional information, please contact me.

Sincerely,

Carol A. Rothstein, Ed.D.
Dean of Instruction

Academic Program Proposal for Lower Division Certificate in

Unmanned Aerial Systems (UAS) Technician

Hagerstown 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.

This proposal seeks approval for a Lower Division Certificate in Unmanned Aerial Systems (UAS) Technician program. This is a 23 credit hour program that will prepare students for careers working with unmanned aerial systems, also known as drones. Students in this program will cover the operation, mechanics, data processing, maintenance, and regulations that pertain to unmanned systems.

Unmanned aerial systems technicians need specific technical and specialized training to operate, maintain, and analyze data that comes from these devices. These skills include understanding how to safely operate an unmanned aerial system, understanding Federal Aviation Administration (FAA) regulations, reading sectional maps, interpreting and analyzing the results from data obtained during flights, understanding and using unmanned aerial system components, and troubleshooting when an issue arises.

The mission of Hagerstown Community College (HCC) is to ensure equitable access to affordable high quality educational programs, promotes practices and policies that ensure student success, and fosters innovation and collaboration to strengthen its regional workforce and community cultural development. This proposed certificate will align with the mission statement address the core components of providing a high quality program that strengthens the regional workforce and provides students an opportunity for success. It will educate students to join a growing and ever-changing workforce with opportunities in a relatively new and upcoming field. In the greater Hagerstown region, there is a need for a program in unmanned systems.

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 plan goal 2 is to "Maintain a responsive, dynamic curriculum and teaching excellence". This strategic goal aligns with the development of the unmanned systems program. Creating this program shows that HCC is responding to the needs of the community and creating engaging and dynamic curriculum to meet those needs.

HCC's vision for Career and Technical Education programs includes engaging learners, challenging students, and meeting industry standards. This proposed program fits with that vision. It is designed to engage and challenge students and to meet the needs of employers. This program will also benefit from multiple existing programs at the college including advanced manufacturing, computer programing, and engineering.

The curriculum for this program was designed by HCC faculty and advisors with years of experience in the unmanned systems field. While creating the content and curriculum for this program HCC collaborated with other institutions including Capitol Technology University and Indiana State University.

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 was awarded a $20,000 Perkins Reserve grant to develop the UAS curriculum and to purchase any needed equipment. The grant provided for a consultant to assist with the course development; it also covered the expenses for the lead faculty member to attend the UAS conference, which will ensure the program meets industry standards. The program will not require funds beyond those earned in the grant. The faculty member responsible for teaching the courses is already a full-time faculty member at HCC and will not receive additional compensation for the UAS courses.

In order to ensure funding and resources are adequate each year, the College engages in an integrated process of planning, evaluation, and budgeting for the following fiscal year. Every unit of the college prepares a plan that reflects its accomplishments (Annual Productivity Report), and, building on the College's mission, vision, institutional priorities, and strategic plan, submits its projected needs (Unit Plan). This planning process identifies challenges and opportunities for each program in the areas of curriculum, recruiting, staffing, and budget. The plan for each unit includes:

• The unit's goals to maintain and improve productivity (e.g. new personnel, supplies, equipment, or facilities);

• Timelines;

• Persons responsible; and

• Assistance that may be required outside the department.

3. **Provide a description of the institution's commitment to:**
    a) **ongoing administrative, financial, and technical support of the proposed program.**
    b) **continuation of the program for a period of time sufficient to allow enrolled students to complete the program.**

The UAS Technician certificate will be part of the Technology and Computer Studies (TCS) Division. The College received a Perkins CTE Reserve grant to create the certificate and purchase equipment. The College is dedicated to maintaining the certificate as part of its normal operating budget for the foreseeable future and does not plan to discontinue it before students have completed 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**

HCC's certificate in Unmanned Aerial Systems Technician will train students to operate, maintain, and utilize unmanned systems to collect, and then analyze data. Students in this program will learn these skills and other necessary skills that will enable them to use unmanned systems in a variety of ways such as small vehicle operators, vehicle repair and maintenance technicians, data interpreters, and data acquirers.

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

The 2017-2021 Maryland State Plan for Postsecondary Education contains three main areas of focus: access, success, and innovation.

Access

HCC participates in a variety of programs that are aimed at high school students and promoting college readiness and success. Dual enrollment/dual credit courses are offered by the college and the college works with Washington County high schools to help promote career and technical education. HCC has a STEMM Technical Middle College which allows college-ready high school

students to earn college credit while completing their high school diploma. This program includes areas such as alternative energy, computer science, engineering, and environmental studies, which are all able to be connected to the Unmanned Aerial Systems Technician program. This aligns with the focus area of access because high school students have the ability to enter college programs while still in high school.

Success

Another area of focus in the postsecondary education plan is success. The plan discusses that there are multiple ways in which the term "success" can be used and achieved by different institutions, students, and other entities. Hagerstown Community College is committed to the success of its students. Instructors observe their students in order to stay informed regarding their needs. Lessons are adjusted as needed to meet the needs of the students and one-on-one attention is given when needed. HCC also has the Learning Support Center, which enables students to get tutoring and help for classes and areas they are struggling. The plan also discusses having "structured schedules" for students, in which classes are formatted to work around different student needs-morning schedules, evening schedules, etc. HCC's classes are scheduled at a variety of times to meet the needs of the wide range of students it serves. The program would be no exception to this practice and would be structured to meet the needs of the cohort of students it serves.

Innovation

The last section of the postsecondary education plan focuses on the need to "foster innovation" in post-secondary education. This proposed program is an example of innovation at work. There are few unmanned systems programs in Maryland and currently none in the Western Maryland region. This program would bring the new and innovative program of unmanned systems to this region and help foster innovation by bringing new ideas and concepts to the area.

The 2013 Maryland State Plan for Postsecondary Education citied the importance of STEM degrees and how these degrees are linked to economic growth, technological innovation, and increased productivity. This is a trend that is expected to continue since our society is becoming more and more dependent on technology. The L.D.C. in Unmanned Aerial Systems will help to further grow HCC's repertoire of STEM programs and degrees.

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.**

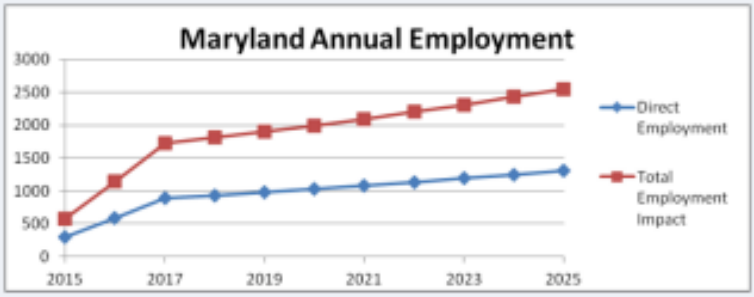
Unmanned systems technicians are able to work in a variety of fields. Some of these fields include: construction, agriculture, alternative energy, search and rescue operations, journalism, forestry, data analysis, and cinematography. Unmanned vehicles can be used to help track and prevent common construction mistakes, help maximize field productivity and output, and assess alternative energy sources such as solar panels and wind turbines. These vehicles can also be used to help police and fire personnel in search and rescue missions and collect footage of previously hard to reach places. Unmanned systems technicians are vital to all of these applications because they are the ones who are controlling the vehicle, collecting that data, and at times, interpreting the data.

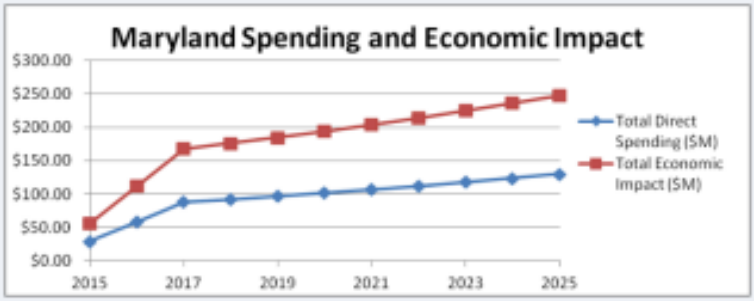
Prior to the FAA releasing the Part 107 Small UAS Rule, a pilot's license was required in order operate an unmanned vehicle. However, the Part-107 regulations make it easier for people without prior aviation training to operate unmanned aerial vehicles. In 2018, the AOPA stated that general aviation growth was projected to "remain "stable" by most measures", but the growth of "commercial drones flown under Part 107" to increase "fourfold in five years". By the end of 2017, the FAA issued 73,673 remote pilot certificates and expects to issue 301,200 by 2022. This increase signifies opportunities for huge growth in industries using unmanned vehicles.

According to the Maryland Department of Commerce's report, "Maryland has an impressive base of aerospace and UAS companies, ranking fourth nationally in number of firms". Maryland is home to two of the nation's leading UAS companies: Webster Field Navy Annex and Patuxent River Naval Air Station. Both of these locations provide aerospace services and have available airspace for unmanned vehicles. There are also multiple companies in Maryland that use unmanned systems in their operations. Some of these companies include UAV Solutions, Ausley Associates, and ASEC.

According to the Association for Unmanned Vehicle Systems International's (AUVSI) 2013 Economic Report, unmanned vehicles will affect the employment, and economy of Maryland in a variety of ways. The report looks at the growth of unmanned systems from 2015-2025, a ten year range. Their findings are summarized in the table and graphs below.

Maryland Economic Impact						
Year	Direct Employment	Total Employment Impact	Total Direct Spending ($M)	Total Economic Impact ($M)	Total State Taxes ($K)	Percent Change Over Previous Year
2015	296	575	$29.33	$55.91	$439.20	
2016	592	1150	$58.67	$111.83	$878.39	100%
2017	888	1725	$88.00	$167.74	$1,317.59	50%
2018	932	1812	$92.40	$176.13	$1,383.46	5%
2019	979	1902	$97.02	$184.93	$1,452.64	5%
2020	1028	1997	$101.87	$194.18	$1,525.27	5%
2021	1079	2097	$106.97	$203.89	$1,601.53	5%
2022	1133	2202	$112.31	$214.08	$1,681.61	5%
2023	1190	2312	$117.93	$224.79	$1,765.69	5%
2024	1249	2428	$123.83	$236.02	$1,853.98	5%
2025	1311	2549	$130.02	$247.83	$1,946.67	5%





The table and graphs show a steady trend of growth in employment for Unmanned Systems Technicians.

The AUVSI's report also discusses how the use of unmanned vehicles in the fields of agriculture and public safety are expected in increase as years go on. Both of these industries are vital to Washington County, so it is reasonable to deduce that the need for Unmanned Systems Technicians will increase in the area.

HCC has a variety of areas of study that currently lends themselves to the proposed Unmanned Aerial Systems Technician program. Areas such as: electrical engineering, mechanical engineering, graphic design, environmental sciences, computer science, and business all have aspects that relate to unmanned vehicles, their operation, and maintenance in some form. It is possible that students in these current fields of study may choose to move to this proposed program during its initial year, or add the certificate to their current studies. Students in the certificate program for Basic Electronics could also easily transition into the program and have some of the prerequisite knowledge.

Washington County also has industries and community services that could benefit from the implementation of an unmanned systems program. The police, fire, and rescue services in the county could benefit from someone having the training to operate and fix unmanned vehicles. Agriculture is a major industry in Washington County. Farmers could benefit from trained unmanned systems technicians who would be able to survey their fields for areas of low production.

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.**

- Community College of Baltimore County (Baltimore, MD)
    - **Professional Pilot Unmanned Aircraft Systems, A.A.S. -**focuses on the academic training required to be a commercial pilot with some specialized training in operating unmanned aerial systems.
- Capitol Technology University (Greater Washington D.C. area)
    - **Unmanned and Autonomous Systems, B.S. -** focuses on unmanned and autonomous flight systems operations, mission planning, weapons, special sensors, data collection, and other aspects of unmanned systems.
    - **Unmanned and Autonomous Systems Policy and Risk Management, M.S. -** focuses on UAS policy, flight operation, mission planning, weapons, and ground control.
    - **Unmanned Systems Applications, Ph.D. -** focuses on providing students with opportunities to conduct extensive and original research on applications of unmanned systems.

2. **Provide justification for the proposed program.**

The other unmanned aerial systems programs in the state are a considerable distance from the HCC campus. This program will allow students in Washington County and students in nearby Pennsylvania to obtain this training in a local setting.

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 HBI's.**

There is no foreseeable impact on the implementation or maintenance of high-demand programs at Maryland's Historically Black Institutions (HBIs).

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.**

There will be no impact on 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.**

The curriculum for this program was designed by HCC faculty and advisors with years of experience in the unmanned systems field. While creating the content and curriculum for this program HCC collaborated with other institutions including Capitol Technology University and Indiana State University.

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

Unmanned Aerial Systems Technician L.D.C. Student Learning Outcomes	
Objective/Outcome	**Justification**
Students will safely operate an unmanned aerial vehicle in the national airspace.	Safe operation of an unmanned vehicle is required by the FAA. Unmanned systems technicians must be able to operate a vehicle while also being aware of other factors that impact that operation of the vehicle such as weather patterns, other vehicles in the airspace, and federal regulations.
Students will be able to read an FAA sectional map.	Unmanned systems technicians must be able to read and understand a FAA sectional map, so that they are aware of where they are able to fly and how big of a zone they have to fly in.
Students will comprehend airspace regulations.	Unmanned systems technicians have to comply with the airspace regulations set by the FAA. These regulations ensure that the vehicles are operated safely and appropriately.
Students will troubleshoot and maintain unmanned vehicles.	The FAA requires that all unmanned systems pilots ensure that their vehicles are "airworthy" prior to being used for operations. This means that unmanned systems technicians need to be able to maintain and troubleshoot issues with their vehicles.
Students will match unmanned systems platforms to specific mission requirements and required sensors.	Unmanned systems technicians need to be aware of the different vehicles and the different applications of each type of vehicle. They must be able to match the vehicle and the purpose in order to get the desired results.
Students will plan and adapt missions based on external factors such as weather, airspace, NOTAMS, and privacy concerns.	Unmanned systems technicians plan and adapt missions based on external factors. Being able to successfully plan and adapt a mission is a necessary skill for technicians to have.

3. **Explain how the institution will:**
    a) **provide for assessment of student achievement of learning outcomes in the program**
    b) **document student achievement of learning outcomes in the program**

Student Learning Outcomes Assessment (SLOA) is a deliberate, systematic, and collaborative process driven by the College's commitment to improve student learning. It is a purposeful course of action that defines student accomplishments in terms of expected learning outcomes and core competencies. Actual student achievement is measured using established internal standards and external benchmarks. The outcomes assessment process is learning-centered and accumulates data from numerous sources to determine what students know, what skills they possess, how they conceptualize, and how they will continue to learn. The overall goal of assessment is to create a quality learning environment under ideal conditions through the use of best practices that inspire creativity, innovation, and critical thinking.

Student Learning Outcomes Assessment is an ongoing component of the instructional process. All members of the institution share responsibility for student learning. Continuous improvement of learning is a collaborative enterprise upon which the success of instruction depends. The results of SLOA are never used in a punitive manner toward students, faculty, or staff. The data collected during the assessment process is used to provide feedback to students and faculty, reinforcing and improving educational practices that facilitate learning.

The Technical Studies program will be evaluated at the course and program level on an annual basis. Resource allocation (including equipment, staff, and faculty) is driven by needs addressed in the SLOA process.

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

Students in the Unmanned Aerial Systems Technician program will complete 14 credits of program requirements courses and select 9 credits of restricted electives, for a total of 23 credits.

ELE-130 Introduction to Unmanned Systems 3 credits

This course is an introduction to civilian unmanned systems. It includes an introduction to current applications, weather, control fundamentals, the principles of flight, and the history of unmanned systems. This course also exposes students to the significant regulations that affecting unmanned systems operations.

Class # UAS Regulations 1 credit

This course prepares students to take the FAA part-107 certification test. Federal regulations, weather, loading, performance, and airspace regulations will all be covered. Operation of unmanned vehicles will also be covered in this course.

Class # Mechanics of Unmanned Systems 3 credits

This course will introduce students to the different components of unmanned systems. Control systems, power plants, power sources, construction, and electronics will all be covered. Students will also learn how to troubleshoot common issues that arise with the maintenance of unmanned systems.

Class # Advanced Unmanned Systems 3 credits

This course builds upon what the students have learned in the other unmanned systems courses. Students will be expected to demonstrate proficiency with unmanned vehicle simulators and flight. Students will also be introduced to the concepts and principles of mission planning involved with unmanned systems.

ELE-110 Fundamentals of Electricity 4 credits

This is a basic electricity course that covers DC and AC circuits. The course has been designed for those students who need an understanding of electrical principles and applications but do not need the theoretical or mathematical depth required for electronic circuit design. Lab exercises in the course deal with many of the practical applications of electricity along with learning to use test equipment for the purposes of circuit diagnosis and troubleshooting.

Restricted Electives 9 credits

Students will take 9 hours of restricted electives in consultation with their advisor. The choices listed below are representative of the different areas of focus that unmanned systems can be utilized in.

- ART 115- Photography I (3 credits)
- CAD 152- Computer Aided Design (3 credits)
- CAD 228- Computer Aided Design: Solid Modeling (3 credits)
- CSC 132- Introduction to C and C++ Programming (3 credits)
- CSC 134- Introduction to JAVA Programming (3 credits)
- ELE 102- Analog Digital Electronics (3 credits)
- ELE-103- Digital Electronics (3 credits)
- ELE 158- Circuits, Schematics, and Test Equipment (3 credits)
- ENV 201- Fundamentals of Environmental Science I (4 credits)
- ENV 202- Fundamentals of Environmental Science II (4 credits)
- GDT 116- Digital Imaging (3 credits)
- GDT 220- Digital Video and Audio (3 credits)
- STU 106- Professionalism in the Workplace (1 credit)

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

N/A

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

There are no specialized accreditation or graduate certification requirements for this program or its students.

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

HCC will not contract with another institution or non-collegiate organization for this program.

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.**

All program requirements, to include curriculum and course requirements are posted in the College's online catalog http://catalog.hagerstowncc.edu/. In addition, programs have their own

dedicated webpage to provide additional resources and information, as well as contact information for faculty overseeing the program. Links within the catalog and on the College homepage direct students to Offices of Financial Aid, Learning Technology, Information Technology, Student Services, and Finance.

Each course syllabus follows a standard template that outlines the number of hours required for the class, and includes both in class and out of class work. Course specific technology requirements are outlined in the syllabus as well as course requirements. Each syllabus also gives contact information for Student Services and the Disabilities' Office.

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.**

The Public Information and Governmental Relations (PIGR) Office manages the content of the HCC website. PIGR staff continuously update program information through ongoing communication with Division Directors, faculty, and program coordinators. The PIGR Office collaborates with the Offices of Academic Affairs, Admissions and Enrollment, and Advising and Registration to ensure all materials accurately and clearly represent the program. All materials that represent the program and/or services provided by the college must be approved by the PIGR Office.

H. Adequacy of Articulation

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

Not Applicable

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 faulty member will teach (in this program).**

<u>Gregory Betz – Instructor – Alternative Energy and Industrial Technology – Full-time</u>

- Bachelors of Science in Technology Education, Millersville University
- Masters of Science in Electronics and Computer Technology, Indiana State University
- Courses:
  - Introduction to Unmanned Systems; UAS Regulations; Mechanics of Unmanned Systems; Sensors, Payloads, and Communication; and Advanced Unmanned Systems

Juan Luna – Instructor – Electrical Engineering Technology – Full-time

- Bachelor of Science in Electrical Engineering Technology, Universidad Technologica Naciona
- Master of Science in Computer Science, George Mason University
- Courses:
  - ELE 110: Fundamentals of Electricity

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) Evidenced-based best practices for distance education, if distance education is offered.

The Fletcher Faculty Development Center (FFDC) at Hagerstown Community College provides a facility, staff support, training, and workshops to help the college's faculty members maintain and improve excellence in teaching. The center was founded in 2010 with a generous grant from the Alice Virginia and David W. Fletcher Foundation. Programs and services include:

- Workshops on teaching and learning topics including flipped classroom, academic dishonesty, reading across the curriculum, online course design, and supporting student purposefulness;
- Consultation by request on any teaching topic, from "What's the policy?" to classroom or online course observations for peer-to-peer feedback;
- Course for Online Teaching Excellence (COTE), an in-house training course in teaching online; and
- Work space, copy service, lockers, and parking tags for adjunct instructors.

In addition to ongoing support for all faculty, the Fletcher Center hosts workshops and guest speakers specifically for career faculty who have extensive industry experience, but need training and support in pedagogy and best practices in education.

The FFDC has revised the COTE (Course in Online Teaching Excellence) training for faculty, by condensing the course down to 2 weeks. The FFDC also provides ongoing face-to-face training for faculty teaching online for the following topics: SoftChalk, Online Course Redesign, Online Accessibility, Open Educational Resources (OERs).

In the fall of 2018, a new Dean of Distance Learning position was created to oversee all distance education at HCC. The new Dean will be implementing an internal review process for all online programs and courses, starting in fall 2019, in which quality assurance reviews will be conducted regularly. All online courses are scheduled to be reviewed within the next three academic years using the Quality Matters (QM) certification rubric. Consequently full time faculty members and academic division directors are now being strongly encouraged to become certified in the QM rubric

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 William M. Brish Library is committed to utilizing the latest technology to provide services and resources, both on and off campus, to meet the academic and professional needs of all members of the college community. The library subscribes to a variety of electronic resources and offers a strong core collection of physical materials that fully supports the college's programs and curriculum. In support of student retention, librarians work to empower students to successfully locate and evaluate scholarly information by providing individual and group instruction, as well as point-of-need reference assistance. The library maintains a calm, welcoming environment that fosters student success.

The Library offers access to full-text articles from a variety of journals available via several online subscription article databases and the Directory of Open Access Journals. The library also subscribes to Films On Demand, Gale Virtual Reference Library, and an extensive collection of e-books.

The library provides access to journals in print and electronic formats that can be located by searching the online library catalog. Altogether, the library's paper and e-book collections contain several thousand items. As well as the books, films, and online databases mentioned above, all students and faculty have access to the library's interlibrary loan services through which they can request copies of articles and temporary loans of books from other libraries.

Students may log in to use any of the library's electronic resources (databases, e-books, and Films On Demand) from anywhere at any time.

The library also produces LibGuides for several courses and units on campus. LibGuides is a content management system in which knowledge is organized around a specific topic, which can then be imbedded into a class or website. Faculty can request a LibGuide to be produced for use as a resource for their classes.

The library is open 8:30 AM to 6:00 PM Monday through Thursday and 8:30 AM to 4:30 PM Fridays. HCC students also have access to a 24 hour 7 days a week "Ask a Librarian" chat forum. Students can send a question to a librarian any time or day and receive an answer within 24 hours.

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.**

Students at HCC have the opportunity to utilize all physical facilities on campus including the William M. Brish Library; Learning Support Center; Behavioral Sciences & Humanities building; Athletic, Recreation and Community Center; STEM building; Technical Innovation Center; Performing and Visual Arts Education Center; Career Programs Building; and the Student Center lounge and dining areas.

The unmanned systems program courses will be taught in a variety of settings across the HCC main campus. Classes will be taught in the STEM Building, which offers students access to updated classrooms and teaching technology such as document cameras, projectors, and computers. The classrooms and common areas are set up to promote collaborative thinking. The Energy and Trades Training Center (ETTC) is the newest building on campus and has almost 3,000 square feet of lecture and lab space. This building also has updated teaching technology including document cameras, interactive projector, and laptops. The lecture space is setup to promote collaborative work and thinking. The Advanced Technology Center has updated lab space, storage for equipment, and classroom space with computers.

In 2018, HCC was approved for a Perkins Reserve grant to start the Unmanned Aerial Systems Technician program. Included in this grant was funding to purchase the necessary equipment to start and maintain the program. The college has purchased the following equipment for the program: unmanned vehicles, flight simulators, motors, autopilots, remotes, batteries, brushless gimbals, cameras, video transmitters, video receivers, software, and tablets to control the vehicles.

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
    a) support for distance education

All students, faculty, and staff at HCC receive access to the electronic mailing system via their respective accounts. Students are able to access their HCC accounts within 24 hours of admission to the college. Faculty gain access once their hiring process is completed. All students and faculty receive a unique address, and may access their accounts remotely via Outlook Web Access.

HCC has recently purchased and implemented Bright Space Desire to Learn (D2L) as its primary Learning Management System (LMS) for online and hybrid credit classes. Within the online environment, students are able to review assignments, course content, course syllabi, and review grades throughout the semester. Our faculty are trained on the features of the LMS, as well as how to develop and manage their online classrooms by the staff in the Fletcher Faculty Development Center and Learning Technology departments. Faculty have access to several features via the LMS (i.e. asynchronous online discussions for collaborating with students and having virtual office hours, ability to provide virtual lectures including animations and/or videos, automatic grading of student work for some quizzes or exams, reports to analyzing student outcomes data, and tracking their students' progress).

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.**

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 1: 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)	19144	31434	50130	76140	100104
a. Number of F/T students	4	6	10	15	20
b. Annual Tuition/Fee Rate	4060	4263	4263	4476	4476
c. Total F/T Revenue (a x b)	16240	25578	42630	67140	89520
d. Number of P/T Students	2	4	5	6	7
e. Credit Hour Rate (# of credits earned)	12	12	12	12	12
f. Annual Credit Hour Rate	121	122	125	125	126
g. Total P/T Revenue (d x e x f)	2904	5856	7500	9000	10584
3. Grants, Contracts & Other External Sources	20000	0	0	0	0
4. Other Sources	0	0	0	0	0
TOTAL (Add 1-4)	39144	31434	50130	76140	100104
TABLE 2: EXPENDITURES					
Expenditure Categories	**Year 1**	**Year 2**	**Year 3**	**Year 4**	**Year 5**
1. Faculty (b+c below)	25670	26440	27233	28050	28892
a. # FTE	0.5	0.5	0.5	0.5	0.5
b. Total Salary	21572	22219	22885	23572	24279
c. Total Benefits	4098	4221	4348	4478	4613
2. Admin. Staff (b + c below)	0	0	0	0	0
a. # 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. # FTE	0	0	0	0	0
b. Total Salary	0	0	0	0	0
c. Total Benefits	0	0	0	0	0
4. Equipment	10000	0	0	0	0
5. Library	0	0	0	0	0
6. New or Renovated Space	0	0	0	0	0
7. Other Expenses - consultant	6000	0	0	0	0
TOTAL (Add 1-7)	41670	26440	27233	28050	28892

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.

Faculty are evaluated annually by the Division Director responsible for their supervision. The purpose of this evaluation is to provide the faculty member with information from a supervisory perspective, synthesize information from various components of the evaluation process, and assist in the development and implementation of the Annual Faculty Review and Professional Development Plan. This evaluation includes: a written report based on a classroom observation, annually for non-tenured faculty, and every three years for tenured faculty; a listing of the prior two semesters' of student evaluations of teaching; and the supervisor's assessment of the faculty member's performance in meeting the full range of faculty duties, including professional development, as well as an assessment of college and community service.
Faculty also undergo evaluation in every course taught via student evaluations. The recommended level of minimum acceptable performance on the evaluation instrument is 75%. Faculty members receiving less than acceptable student evaluations are counseled and given advice by his/her Division Director to improve his/her evaluation scores.

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.

The Office of Planning and Institutional Effectiveness (PIE) is responsible for our research and evaluation processes. Through this department the institution will manage student satisfaction, as well as cost-effectiveness based on enrollment. Assessment of student retention and learning outcomes happens at the division level and is overseen by the Office of Academic Affairs.

Each year the College engages in an integrated process of planning, evaluation, and budgeting for the following fiscal year. Every unit of the college prepares a plan that reflects its accomplishments (Annual Productivity Report), and, building on the College's mission, vision, institutional priorities, and strategic plan, submits its projected needs (Unit Plan). This planning process identifies challenges and opportunities for each program in the areas of curriculum, recruiting, staffing, and budget. The plan for each unit includes:

- The unit's goals to maintain and improve productivity (e.g. new personnel, supplies, equipment, or facilities);
- Timelines;

- Persons responsible; and
- Assistance that may be required outside the department.

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

"The College believes in and teaches the ideals and values of cultural and racial diversity and a democratic way of life. HCC also seeks to cultivate in its students critical and independent thought, openness to new ideas, a sense of self direction, moral sensitivity, strength through diversity, and the value of continuing education and life-long learning" (HCC Value Statement).

The Unmanned Aerial Systems Technician program, like all HCC programs, will support the Colleges' value statement and its commitment to cultural diversity. Recognizing the importance of embracing diverse cultures in instruction, HCC offers diversity to its Emerging Issues and Interdisciplinary General Education category, thereby requiring that all degree-seeking students take one three-credit course pertaining to multiculturalism and diversity. In addition, the College employs a full-time multicultural recruiter as well as several support services designed to support and case manage at-risk students (up to 40% of whom are a minority) to help them persist, complete their courses, and graduate.

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.

This 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.

Due to the technical aspects of the classes proposed in this program, it will not be offered completely online, but some individual courses will be available online for students.

According to COMAR policy 13B.02.03.22, "An institution may not utilize distance education as a program modality unless the institution: 1) As of January 1, 2018, offers at least one distance education program that has been approved by the Commission and that has received appropriate designation from the institutional accreditor; or 2) Is designated by the Secretary, under §B of this regulation, as an institution eligible to provide distance education". Middle Sates Commission on Higher Education (MSCHE) confirmed that Hagerstown Community College (HCC) was "fully approved" to offer distance education programs in their letter to former HCC president Dr. Guy Altieri, dated June 24, 2016.

HCC currently has several degrees and certificates currently offered via 100% online delivery, which have also been submitted to Maryland Higher Education Commission (MHEC).

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

C-RAC is a collective of seven regional organizations including the Middle Sates Commission on Higher Education (MSCHE). Hagerstown Community College is currently accredited through MSCHE, and follows the appropriate guidelines in order to adhere to the national standards and integrity for our distance education programs. As stated previously, HCC received approval from MSCHE to offer distance education programs on June 24, 2016.

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